

Modal and Anti-Luck Epistemology

Tim Black

Forthcoming in the *Routledge Companion to Epistemology*

1. Gettier cases and anti-luck epistemology

The influence of Edmund Gettier's "Is Justified True Belief Knowledge?" seems to extend to every corner of epistemology. Gettier's counterexamples to the tripartite account of knowledge, according to which to know is to have a justified true belief, involve epistemic agents whose beliefs are true simply as a matter of luck. These counterexamples are widely, perhaps universally taken to show that an epistemic agent can be justified in holding the true belief that p but nonetheless fail to know that p . It has thus become a tenet of orthodox epistemology that no belief, not even if it is true and we are justified in holding it, can amount to knowledge if it is true simply as a matter of luck.

In one of Gettier's counterexamples, Smith is justified in believing both that Jones will get the job and that Jones has ten coins in his pocket. From these two beliefs, Smith justifiably infers that

(C) the man who will get the job has ten coins in his pocket.

Smith's inferential belief, let us suppose, is true. Still, Smith's belief does not count as knowledge: although Jones will *not* get the job, "by the sheerest coincidence, and entirely unknown to Smith," *he* (Smith) will get the job, and *he* has ten coins in his pocket (Gettier (1963: 123)). Although Smith comes to hold his belief that C in a way that is very reliable and which provides him with reasons that would in normal circumstances be identical to the reasons why his belief is true, his belief is based in this instance on reasons that are *different* from those that make it true. Smith's inferential belief that C, then, is true simply as a matter of luck, and hence fails to count as knowledge.

Now, while it is helpful to think about Gettier cases in terms of luck, in that it helps us to understand what keeps their protagonists from knowing, it is less helpful than it might be. What exactly does it mean to say that Smith's belief is true simply as a matter of luck? It seems that there are two ways in which one might respond to this question.

First, there is the thought that justification—that is, the kind of justification that Smith has for believing that *C*—matters epistemically. The thought in other words is that if *S* is to know that *p*, then her believing that *p* must represent an appropriate response to the evidence. To respond appropriately, *S* must first avail herself of a sufficient amount of the relevant evidence, which will somehow indicate which belief, if any, it supports. *S* must then respond doxastically in the way her evidence directs her to respond, and she must respond in this way *because* her evidence directs her to do so. Given that her evidence indicates that it supports the truth of *p*, and given that *S* believes that *p* because her evidence supports the truth of *p*, she is justified in believing that *p*. We can spell out this notion of justification as follows (compare Kornblith (1983), Bonjour (1985), Greco (1990), and Riggs (1998)):

S is justified in believing that *p* if and only if [a] she avails herself of a sufficient amount of the relevant evidence, where the relevant evidence is any that bears on the truth or falsity of *p*, [b] she conducts a reasonably thorough reflective examination of her evidence, [c] her evidence, so far as she can tell on the basis of her reflective examination, is appropriately connected to the fact that *p*, and [d] *S* forms a belief that *p* on the basis of her evidence for *p*.

Corresponding to this conception of justification is a conception of luck:

S's belief that *p* is true simply as a matter of luck if and only if [a] *S* is justified in believing that *p*, [b] her justification for *p*—that is, the evidence that figures into her

being justified in believing that p —is *not* appropriately connected to the fact that p ;
but [c] p is nevertheless true.

One might hope to eliminate this sort of luck by making sure that one's justification for p is appropriately connected to the fact that p . Yet it has proven notoriously difficult to do this. Indeed, some have been led to conclude that it cannot be done. Such a conclusion appears attractive not only in the light of Gettier cases, where S 's belief is true for reasons that are different from those on which her belief is based, but also in the light of cases in which S 's belief is true for reasons that are quite closely related indeed to those on which her belief is based.

Suppose, then, that S holds a ticket in a fair lottery with a large number of participants and long odds. S forms the belief, on the basis of considerations involving the extremely low probability that her ticket is a winner, that her ticket is a loser. Suppose further that a winner has been selected and that S has not won; her ticket is in fact a loser. Here again, as in the Gettier case discussed above, S comes to believe that her ticket is a loser in a very reliable way. Yet, while Smith's reasons in the Gettier case are different from those that make his belief true, S 's belief in the lottery case is based on reasons that are closely related to those that make it true: The fact that there's an extremely low probability that S 's ticket is a winner not only serves as the basis of her belief, but it also has much to do with her belief's being true. Even in this case, however, we are reluctant to say of S that she knows that her ticket is a loser. Her belief seems true simply as a matter of luck. It does seem difficult, then, to ensure that our justification is appropriately connected to the facts.

Some feel, however, that the sort of luck highlighted by Gettier cases and by lottery cases does not concern the connection between the facts and our beliefs' justification. Rather, they concern the connection between the facts and our beliefs *themselves*. Thus, the protagonists in Gettier cases and in lottery cases fail to have knowledge because their beliefs are true simply as a

matter of luck, where this means that their beliefs themselves are not appropriately connected to the facts.

But how should we characterize this new conception of luck? Duncan Pritchard helpfully suggests that our protagonists' beliefs are true as a matter of *veritic epistemic luck*, which he characterizes in the following way: "It is a matter of luck that the agent's belief is true," where

this demands that the agent's belief is true in the actual world, but that in a wide class of nearby possible worlds in which the relevant initial conditions are the same as in the actual world—and this will mean, in the basic case, that the agent at the very least forms the same belief in the same way as in the actual world [...]—the belief is false.

(Pritchard (2005: 146))

So, for example, Smith's belief is veritically epistemically lucky because while it is true in the actual world, it is false in too many of the nearby possible worlds in which Smith forms the belief that C in the same way as in the actual world. To avoid being veritically epistemically lucky, Smith's belief must be true not only in the actual world, but also in a sufficient proportion of the nearby possible worlds in which he forms the belief that C in the same way as in the actual world. Theories that address the issue of veritic epistemic luck are *modal epistemologies*, according to which a belief counts as knowledge only if there is a modal connection—that is to say, a connection not only in the actual world, but also in other non-actual possible worlds—between the belief and the facts of the matter. A bit more concretely, a modal epistemology might say that a belief counts as knowledge only if it is true not only in the actual world, but also in a certain proportion of worlds within a specified set or range of non-actual possible worlds.

The difficulty here, of course, is with 'a sufficient proportion': in order to eliminate veritic epistemic luck, in *what* proportion of the relevant nearby possible worlds must Smith's belief that C be true? In trying to answer this question, epistemologists start from at least two places. Each of

these two places corresponds to a distinct way of giving expression to the anti-luck intuition involved in this understanding of the problematic cases. First, to say that Smith's belief is true simply as a matter of luck might be to say that there is nothing about Smith's circumstances, in which his belief happens to be true, that ensures that he will believe that C—even if C had been false, Smith might nonetheless have believed that C. This way of giving expression to our anti-luck intuition corresponds to epistemologies known as *sensitivity* theories, which we will consider in Section 2.

Next, to say that Smith's belief is true simply as a matter of luck might be to say that there is nothing about that which led Smith to believe that C that ensures that C will be true—it might have been that Smith's circumstances are just as they actually are, but that his belief that C is *false*. This way of giving expression to our anti-luck intuition corresponds to modal epistemologies known as *safety* theories, which we consider in Section 3.

2. *Sensitivity Theories*

Robert Nozick (1981) famously suggests that S knows that p only if S's belief that p is sensitive to the truth, that is, only if S would not believe that p if p were false (compare Dretske (1971)). In evaluating sensitivity's counterfactual condition, we consider the nearest possible world in which p is false—that is, the state of affairs, or the world, in which p is false, but that is otherwise as similar to the actual state of affairs as it can be—and then to determine whether, in that world, S believes that p . If S does believe that p in that world, then her belief that p is insensitive, and she does not know that p . If S does not believe that p in that world, her belief is sensitive, and she can therefore know that p .

As Nozick points out, sensitivity theories, unlike the tripartite account, allow us to get the right result in Gettier cases. According to sensitivity theories, Smith doesn't know that C because

his belief that C is true simply as a matter of luck: In the nearest possible world in which the man who'll get the job does *not* have ten coins in his pocket—which, let's suppose, is a world in which Jones has ten coins in his pocket but Smith, who'll get the job, has only nine coins in his pocket—Smith nonetheless believes that the man who'll get the job *does* have ten coins in his pocket (see Nozick (1981: 173)).

Sensitivity theories also help with the lottery case, where the difficulty is to explain why we consider S's belief to be true simply as a matter of luck even when it's true for reasons that are closely related to those on which it is based. According to sensitivity accounts, we consider S's belief to be true simply as a matter of luck, and thus as failing to count as knowledge, because in the nearest possible world in which S's ticket is *not* a loser, she still believes that her ticket *is* a loser. Thus, in spite of the fact that S's belief is based on strong probabilistic reasons, and in spite of the fact that her belief is true for reasons that are closely related to those on which it is based, her belief is nevertheless insensitive.

Sensitivity theories almost immediately face a problem, however, which arises from their treatment of a certain anti-skeptical argument:

1. I know that I have hands.
2. I know that my having hands entails that I'm not a handless brain-in-a-vat (that is, a handless brain floating in a vat of nutrients and electrochemically stimulated so as to generate perceptual experiences that are exactly similar to those that I am now having in what I take to be normal circumstances).
3. If I know *both* that I have hands *and* that my having hands entails that I'm not a handless brain-in-a-vat, then I know that I'm not a handless brain-in-a-vat.
4. Therefore, I know that I'm not a handless brain-in-a-vat.

Sensitivity theories have trouble with this argument in two ways. First, there is the complaint that while sensitivity theories allow us to say that (1) is true, they force us to deny (4). (1) is true because my belief that I have hands is both true and sensitive—the nearest possible world in which I have no hands is a world in which, let’s say, I lost my hands in some unfortunate accident; but I do not believe in that world that I have hands, for I clearly see that I have no hands. (4) is false, however, because even if my belief that I’m not a handless brain-in-a-vat is true, it is *insensitive*—in the nearest possible world in which I *am* a handless brain-in-a-vat, I still believe that I’m *not* a handless brain-in-a-vat, since in that world everything appears to me just as it does in this world.

Moreover, this sort of result suggests that sensitivity theorists will reject (3), which is an instance of a very plausible epistemic closure principle:

If S knows that p and that p entails q , then S knows that q .

We feel the intuitive pull of this principle in cases like the present one. Surely, it seems, if I know that I have hands, I also know that certain incompatible skeptical hypotheses are false, hypotheses like the one according to which I am a handless brain-in-a-vat. So, since sensitivity theories seem both to lead to the rejection of a very plausible closure principle and to offer no direct response to the skeptic—that is, no response according to which we know that certain skeptical hypotheses are false—many epistemologists are reluctant to adopt them.

Yet this is not the end of the story, for Nozick (1981: 179) revises his theory in order “to take explicit account of the ways and methods of arriving at belief” (Nozick (1981: 179)), where we can rely on a standard taxonomy of methods which includes perception, memory, testimony, and intuition:

S knows that p if and only if

- a. p is true;
- b. S believes, via method or way of coming to believe M , that p ;

- c. if p weren't true and S were to use M to arrive at a belief whether (or not) p , then S wouldn't believe, via M, that p ; and
- d. if p were true and S were to use M to arrive at a belief whether (or not) p , then S would believe, via M, that p .

Nozick provides the following example in support of this revision: “A grandmother sees her grandson is well when he comes to visit; but if he were sick or dead, others would tell her he was well to spare her upset” (Nozick (1981: 179)). When her grandson is well, the grandmother believes on the basis of seeing him that he is well. But if he were not well, she would use another method—Nozick stipulates that she would use testimony—in forming a belief as to whether her grandson was well. In that case, however, her belief would be *false*. Yet, as Nozick says, the fact that she *would* use another method “does not mean that she doesn't know he is well (or at least ambulatory) when she sees him” (Nozick (1981: 179)). This suggests that the only worlds that are relevant to S's knowing that p are worlds in which, in arriving at the belief that p , she forms her belief in the same way as in the actual world.

Moreover, given Nozick's revised sensitivity condition, although Nozick himself failed to notice this, worlds in which I am a handless brain-in-a-vat need not be relevant to whether I know that I'm not a handless brain-in-a-vat. In those worlds, one might argue, my belief is produced by a method that is different from the one that produces my belief in the actual world (see Black (2002)). Thus, Nozick's revised sensitivity condition gives us room to say that I know both that I have hands and that I'm not a handless brain-in-a-vat. Sensitivity theories, at least those willing to make the sort of revision recommended by Nozick, need neither embrace skepticism nor deny the epistemic closure principle. (Roush's (2006) sensitivity-based theory, which utilizes a probabilistic interpretation of the counterfactuals in Nozick's account, is also meant to allow for knowledge to be closed under known entailment.)

Yet there are cases that cause trouble even for Nozick's revised theory. Keith DeRose provides two such cases. First, take my belief that

(F) I don't falsely believe that I have hands.

It certainly seems that I know that F, yet my belief that F is insensitive, for I would hold that belief even if F were false (see DeRose (1999: 196-197)). In DeRose's second case, I believe that

(D) I'm not an intelligent dog who's always incorrectly thinking that I have hands.

Here too, it seems that I know that D in spite of the fact that my belief that D is insensitive (see DeRose (1999: 196-197)).

In responding to these cases, DeRose says,

We *don't* ... judge ourselves ignorant of P where not-P implies something we take ourselves to know to be false, without providing an explanation of how we came to falsely believe this thing we think we know. Thus, *I falsely believe that I have hands* implies that I don't have hands. Since I do take myself to know that I have hands (*this* belief isn't insensitive), and since the above italicized proposition doesn't explain how I went wrong with respect to my having hands, I'll judge that I do know that proposition to be false. (DeRose (1999: 197))

DeRose here suggests the following weakened sensitivity condition:

(WES) S knows that p only if *either* S sensitively believes that p *or*, where $\sim p$ implies some q and S knows that $\sim q$, $\sim p$ fails to explain how S might come to hold the false belief that $\sim q$.

Note that the second disjunct of (WES)'s consequent—call it (EXP)—has three components:

- (EXP) (i) $\sim p$ implies some q ,
- (ii) S knows (in the actual world) that $\sim q$, and
- (iii) $\sim p$ fails to explain how S might come to hold the false belief that $\sim q$.

The introduction of (EXP) allows us to hand down the proper verdict in each of the two problematic cases. In the quoted passage, DeRose explains how (EXP) helps us to get the right result in the first case. (EXP) helps in the second case as well, for (i) *I'm an intelligent dog who's always incorrectly thinking that I have hands* implies *I don't have hands*, (ii) I know that I have hands, and (iii) my being such a dog fails to explain how I might come to hold the false belief that I have hands. (For an extended discussion of this sort of proposal, see Black and Murphy (2007).)

Still, there are objections. Juan Comesaña suggests that (WES) has trouble dealing with Ernest Sosa's Garbage Chute Case:

I throw a trash bag down the garbage chute of my condo. Some moments later I believe, and know, that the trash bag is in the basement. If the trash bag were not in the basement, however, that would be because it is stuck somewhere in the chute, and I would still believe that it is in the basement. (Comesaña (2007: 783), adapted from Sosa (2000))

Comesaña maintains that (WES) has trouble dealing with this case when q is *The trash bag is in the basement*. The relevant instance of (EXP) is this:

- (i) *The trash bag is not in the basement* entails *the trash bag is not in the basement*,
- (ii) I know that the trash bag is in the basement, and
- (iii) *The trash bag is not in the basement* fails to explain how I might come to hold the false belief that *the trash bag is in the basement*.

Comesaña maintains that (iii) is false. He says that “the closest situation w[h]ere the trash bag is not in the basement is one that *does* explain why I would still falsely believe that it is in the basement (because it is a situation where the trash bag *misleadingly* appears to be in the basement)” (Comesaña (2007: 786). Given this, and given that I insensitively believe that the trash bag is in the basement, (WES) says that I fail to know that the trash bag is in the basement.

Yet (iii) is *true* in Comesaña's case. Moreover, when (iii) is false, we do *not* know that the trash bag is in the basement. Either way, (WES) is in the clear. First, in Comesaña's Garbage Chute Case, (iii) is true; that is, $\sim T$, *the trash bag is not in the basement*, does fail to explain how I might come to hold the false belief that T , *the trash bag is in the basement*. Note that in the closest situations in which $\sim T$, the fact that $\sim T$ occupies no position in the causal history of my belief that T , for I am in no way acquainted with the fact that $\sim T$. I neither see nor hear that the trash bag isn't in the basement, and no one tells me (anything which would suggest) that it isn't in the basement. In the closest situations in which $\sim T$, I come to believe that T *in spite of* the fact that $\sim T$, and so we shouldn't say that $\sim T$ explains how I might come to hold the false belief that T . In this instance, then, (iii) is in fact true, which means that the Garbage Chute Case, at least when we configure that case as one in which q is *The trash bag is in the basement*, doesn't count against (WES).

Next, consider a case in which (iii) is *not* true, that is, a case in which $\sim T$ *does* explain how I might come to hold the false belief that T . Suppose that the condo's janitor likes to trick its tenants. When there's a problem with the garbage chute, he says there isn't a problem. When my trash bag fails to make it to the basement, he tells me that the garbage chute is unobstructed and working fine. The fact that my trash bag didn't make it to the basement helps to explain how I come to hold the false belief that it *did* make it to the basement. In this case, though, (WES) renders the correct verdict: It says that I don't know that the trash bag is in the basement. After all, if it weren't in the basement, the janitor would tell me that it is. (WES) is therefore in the clear both in the case Comesaña presents—since (iii) is true in that case—and in a case in which (iii) is false—since I fail in that case to know that T . (For an extended discussion of this sort of reply to Comesaña's objection, see Murphy and Black (2007).)

3. Safety Theories

The anti-luck intuition that we have in response to Gettier cases and lottery cases might also take the following form: to say that S's belief that p is true simply as a matter of luck is to say that there is nothing about that which led S to believe that p that ensures that p will be true—it might have been that S's circumstances are just as they actually are, but that her belief that p is *false*. This way of giving expression to our anti-luck intuition corresponds to modal epistemologies known as *safety* theories. Ernest Sosa, who introduced a safety condition on knowledge, gives expression to such a condition as follows:

Call a belief by S that p “safe” iff: S would believe that p only if it were so that p .
(Alternatively, a belief by S that p is “safe” iff: S would not believe that p without it being the case that p ; or, better, iff: as a matter of fact, though perhaps not as a matter of strict necessity, not easily would S believe that p without it being the case that p .) (Sosa (1999: 142))

Pritchard, whose anti-luck epistemology revolves around a safety condition, provides some of the details that are left implicit in Sosa's formulation: If S knows a contingent proposition, p , then in most nearby possible worlds, S believes that p only when p is true (see, for example, Pritchard (2005: 71)). In evaluating S's belief in accordance with a safety principle, we consider all of the nearby possible worlds in which S believes that p . If in most of those worlds p is true, then S's belief that p is safe. If, on the other hand, S's belief that p is false in too many of those worlds, S's belief is not safe.

Like sensitivity accounts, safety accounts yield the right result in Gettier cases. Suppose once again that although Smith is justified in holding the true belief that C, he does not *know* that C. Smith's belief is true simply as a matter of luck since “by the sheerest coincidence, and entirely unknown to Smith,” *he* (Smith) will get the job, and *he* has ten coins in his pocket (Gettier (1963:

123)). The safety condition yields the right result here: Smith doesn't know that C because C is false in too many nearby possible worlds in which he believes that C.

But there are cases which suggest that the safety condition, as it is formulated above, is inadequate.

FELON: A man has been accused of murder. The man's mother holds the true belief that her son is innocent, and she holds this belief on the basis of excellent evidence in its favor, including reliable forensic evidence about the cause of the victim's death. It seems, then, that the mother knows that her son is not the murderer.

Yet while her son is not in fact the murderer, he very nearly was—he intended to murder the victim but before he could act on his intention, the victim, let's say, died of a heart attack. Moreover, in too many of the nearby worlds in which the man's mother believes that he is not the murderer, he *is* the murderer and her belief that her son is innocent is generated simply by her intense love for her son (see Pritchard (2005: 153); Armstrong (1973: 208-9) discusses a similar case, attributing it to Gregory O'Hair.)

Again, our intuition here is that the mother knows that her son is innocent. After all, she is well aware of excellent forensic evidence in favor of the claim that he's innocent. According to safety, however, at least as it's formulated above, the mother does *not* know that her son is innocent, for in too many of the nearby possible worlds in which she believes that her son is innocent, her son did in fact murder the victim.

This sort of case highlights the need to make it more difficult for a world to count as one of the relevant nearby possible worlds. It suggests in particular that the safety condition ought to make additional demands which concern the methods that epistemic agents use in forming their beliefs:

(Safety II) If S knows a contingent proposition, *p*, then in most nearby possible worlds *in which S forms her belief about p in the same way as she forms her belief in the actual world*, S believes that *p* only when *p* is true.

Safety II handles FELON, for in most of the nearby possible worlds in which the mother forms her belief about her son's innocence *on the basis of excellent evidence in favor of that belief*, her son did not murder the victim.

Yet Safety II faces difficulties of its own. Suppose once again that S holds a ticket in a fair lottery with a large number of participants. Of course, we are reluctant to say of S that she knows that her ticket is a loser. Nonetheless, S's belief satisfies the conditions set out in Safety II—in *most* nearby possible worlds in which she believes that her ticket is a loser, and in which she forms her belief as she does in the actual world, *viz.* on the basis of her belief that it is highly likely that her ticket is a loser, her ticket is in fact a loser. "The problem," Pritchard (2005: 163) says, "seems to be that the agent's belief, whilst meeting [Safety II], is still veritically lucky since, given the nearness of the possible worlds in which the agent wins the lottery (and thus where forming her belief on the basis of the odds leads her astray), it is still a matter of luck that her belief happens to be true."

What is required at this point, according to Pritchard, is a third, stronger version of the safety principle, one that increases the proportion of the relevant nearby possible worlds in which S's belief must be true:

(Safety III) If S knows a contingent proposition, *p*, then in *nearly all (if not all)* nearby possible worlds in which S forms her belief about *p* in the same way as she forms her belief in the actual world, S believes that *p* only when *p* is true.

Safety III handles the lottery case. S fails to know that her ticket is a loser, according to Safety III, because in too many of the nearby possible worlds in which she believes that her ticket is a loser,

and in which she forms her belief in the same way she does in the actual world, her ticket is *not* a loser.

Indeed, Pritchard's main argument for Safety III—and for its “nearly all (if not all)” qualification—comes in terms of the lottery puzzle: “The agent who forms her belief that she has lost the lottery purely on the basis of the odds involved lacks knowledge because her belief, whilst true and matching the truth in most nearby possible worlds in which she forms her belief in the same way as in the actual world, does not match the truth in a *small cluster* of nearby possible worlds in which what she believes is false (i.e. where she wins the lottery)” (Pritchard (2005: 163), my emphasis). But what if her belief fails to match the truth in an *even smaller cluster* of nearby possible worlds? In such a case, Safety III might count her as knowing that she has lost the lottery. But this is counterintuitive, perhaps because we are reluctant to count the agent as knowing if there is *even one* nearby possible world in which her belief fails to match the truth.

Moreover, John Greco (2007: 301) maintains that Pritchard's Safety III is ambiguous between *strong safety*—“In close worlds, always if *S* believes *p* then *p* is true. Alternatively, in close worlds never does *S* believe *p* and *p* is false”—and *weak safety*—“In close worlds, usually if *S* believes *p* then *p* is true. Alternatively, in close worlds, almost never does *S* believe *p* and *p* is false.” Safety III says that *S* *knows* that she has lost the lottery when it is read as *weak safety*, but that *S* does *not* know that she's lost the lottery when it's read as *strong safety*.

All of this leads us away from Safety III, and to the final version of the safety principle that we will see in this entry, a revision which Pritchard calls SP**:

(SP**) *S*'s belief is safe if and only if in most nearby possible worlds in which *S* continues to form her belief about the target proposition in the same way as in the actual world, and in all very close nearby possible worlds in which *S* continues to form her belief

about the target proposition in the same way as in the actual world, the belief continues to be true (see Pritchard (2007: 290-2)).

SP** handles the lottery case in what seems to be a fairly unobjectionable way.

Still, some cases might weigh against SP**. Consider the following case:

EXPERIMENT: I am participating in a psychological experiment, in which I am to report the number of flashes I recall being shown. Before being shown the stimuli, I consume a glass of liquid at the request of the experimenter. Unbeknownst to either of us, I have been randomly assigned to the control group, and the glass contains ordinary orange juice. Other experimental groups receive juice mixed with one of a variety of chemicals which hinder the functioning of memory without a detectable phenomenological difference. I am shown seven flashes and judge, truly and knowingly, that I have been shown seven flashes. Had I been a member of one of the experimental groups to which I was almost assigned, I would have been shown only six flashes but still believed that I had been shown seven flashes due to the effects of the drug. It seems that in the actual case I know that the number of flashes is seven despite the envisaged possibility of my being wrong. And yet these possibilities are as similar in other respects as they would have to be for the experiment to be well designed and properly executed. (Neta and Rohrbaugh (2004: 400))

SP** seems to count my belief in EXPERIMENT as unsafe and thus as something other than knowledge.

Yet for this unacceptable result to hold up, the worlds in which I am assigned to a non-control group and in which I am impaired must be very close to the actual world. Safety theorists

might be able convincingly to argue, however, that such worlds are not *very* close to the actual world. For one thing, the very fact that I am impaired in these worlds might make it the case that they are too far away from the actual world to count as being very close to it; safety theorists might argue that the only *very* close worlds in this case are worlds in which I am assigned to the control group and in which I drink ordinary orange juice. In worlds like that, though, it seems that my belief that I have been shown seven flashes continues to be true. If this sort of response to EXPERIMENT is effective, then my belief that I have been shown seven flashes can still count both as safe and as an instance of knowledge.

Incidentally, EXPERIMENT seems also to count against sensitivity theories—if I had not been shown seven flashes, if I had been shown only six flashes, I nevertheless would have believed that I have been shown seven flashes. Yet sensitivity theorists, at least those who subscribe to a condition like (WES), can provide a response to EXPERIMENT that is similar to the one provided by safety theorists. Sensitivity theorists, like safety theorists, might argue that a world cannot count as being very close to the actual world unless it is a world in which I am assigned to the control group and drink ordinary orange juice. In this case, however, the hypothesis that I have been shown only six flashes fails to explain how in very close possible worlds, I might come to hold the false belief that I have been shown seven flashes. If this sort of response to EXPERIMENT is effective, my belief that I have been shown seven flashes can both satisfy the conditions set out in (WES) and count as an instance of knowledge.

4. Concluding remarks

Modal epistemologies—sensitivity theories and safety theories—do much to let us know what it is for a belief to be true simply as a matter of luck, and thus what is required in order to eliminate this sort of luck. We have seen this demonstrated in the way that modal epistemologies handle Gettier

cases, lottery cases, and cases of several other sorts. Perhaps, though, there are still other cases in which it seems that we hold beliefs that are true simply as a matter of luck. Yet rather than showing that modal epistemologies are on the wrong track, those cases might simply be suggesting ways in which such epistemologies might be improved or “highlight[ing] the vagueness inherent in the extension of philosophically interesting terms” (Pritchard (2007: 290)). Modal epistemologies therefore seem quite promising—indeed, given that such epistemologies do an excellent job of characterizing epistemic luck and of setting forth the conditions that must be met if such luck is to be eliminated, it rather seems that modal epistemologies represent the right approach to some central issues in the theory of knowledge.

REFERENCES

- Armstrong, D. M. (1973). *Belief, Truth and Knowledge* (Cambridge: Cambridge University Press).
- Black, Tim. (2002). ‘A Moorean Response to Brain-in-a-Vat Scepticism’, *Australasian Journal of Philosophy* 80: 148-163.
- Black, Tim and Peter Murphy. (2007). ‘In Defense of Sensitivity’, *Synthese* 154: 53-71.
- BonJour, Laurence. (1985). *The Structure of Empirical Knowledge* (Cambridge, MA: Harvard University Press).
- Comesaña, Juan. (2007). ‘Knowledge and Subjunctive Conditionals’, *Philosophy Compass* 2: 781-791.
- DeRose, Keith. (1999). ‘Solving the Skeptical Problem’, in *Skepticism: A Contemporary Reader*, Keith DeRose & Ted A. Warfield, eds. (New York: Oxford University Press): 183-219.
- Dretske, Fred I. (1971). ‘Conclusive Reasons’, *Australasian Journal of Philosophy* 49: 1-22.
- Gettier, Edmund. (1963). ‘Is Justified True Belief Knowledge?’, *Analysis* 23: 121-123.
- Greco, John. (1990). ‘Internalism and Epistemically Responsible Belief’, *Synthese* 85: 245-77.
- _____. (2007). ‘Worries about Pritchard’s safety’, *Synthese* 158: 299-302.

- Kornblith, Hilary. (1983). 'Justified Belief and Epistemically Responsible Action', *The Philosophical Review* 92: 33-48.
- Murphy, Peter and Tim Black. (2007). 'Comments on Juan Comesaña's "Knowledge and Subjunctive Conditionals"', On-Line Philosophy Conference 2, http://experimentalphilosophy.typepad.com/2nd_annual_online_philoso/files/murphy_and_black_on_comesana.doc.
- Neta, Ram and Guy Rohrbaugh. (2004). 'Luminosity and the Safety of Knowledge', *Pacific Philosophical Quarterly* 85: 396-406.
- Nozick, Robert. (1981). *Philosophical Explanations*. (Cambridge, MA: Harvard University Press).
- Pritchard, Duncan. (2005). *Epistemic Luck*. (Oxford: Clarendon Press).
- _____. (2007). 'Anti-luck epistemology', *Synthese* 158: 277-297.
- Riggs, Wayne D. (1998). 'What are the 'Chances' of Being Justified?', *The Monist* 81: 452-472.
- Roush, Sherrilyn. (2006). *Tracking Truth: Knowledge, Evidence, and Science*. (New York: Oxford).
- Sosa, Ernest. (1999). 'How to Defeat Opposition to Moore,' in James E. Tomberlin, ed., *Philosophical Perspectives* 13, *Epistemology* (Blackwell): 141-153.
- _____. (2000). 'Skepticism and Contextualism', *Philosophical Issues* 10: 1-18.