CHAPTER 1

The resilience of sensitivity

Kelly Becker and Tim Black

This volume presents state-of-the-art thinking about a very simple and intuitively compelling idea in epistemology. It is an idea most closely associated with Robert Nozick's *Philosophical Explanations*, which was published in 1981, but it was nevertheless famously and forcefully expressed, in subtly different formulations, in earlier works by Fred Dretske (1971) and Alvin Goldman (1976). The idea has come to be known as 'sensitivity',[1] a principle typically characterized as a necessary condition for knowledge. A simple version of sensitivity says that S knows that p only if, were p false, S would not believe that p. The basic notion is that truly believing that p does not suffice for knowledge; in addition, one knows only if one's way (or method) of believing involves a capacity to discriminate the state of affairs where p is true from what would be the case were p false.

It is a testament to the power of this simple idea that it remains alive and well in the literature even though, for at least the past thirty years, it has been criticized from almost every angle. Numerous counterexamples to sensitivity have been proposed and, indeed, found persuasive; some of its implications have been found intolerable; and commentators have doubted whether sensitivity can be explicated in a consistent and satisfactory way. Yet no matter how convincing the case against sensitivity, whenever one looks at it with fresh eyes, its elegance and intuitive plausibility are undeniable.

A further testament to sensitivity is its fecundity. The central insight has spawned alternative, non-subjunctive interpretations, including Sherri Roush's (2005 and this volume) conditional probability approach and Lars Bo Gundersen's (this volume) dispositional analysis. Sensitivity admits of both internalist (for example, Kelly Becker [this volume]) and externalist

[1] Nozick used the term 'sensitivity' for twin principles, which he called 'variation' – if p were false, S would not believe that p – and 'adherence' – if p were true, S would believe that p. When S's belief satisfies both principles, it is said to 'track' the truth. This book is almost exclusively concerned with the variation condition, now known as sensitivity.

(Black 2002) construals of methods of belief formation. It has also been incorporated into contextualist epistemology (DeRose 1995). Finally, were it not for all the hand-wringing over sensitivity, it seems unlikely that its descendant, the safety principle in epistemology, espoused by Ernest Sosa, Timothy Williamson, Duncan Pritchard, Steven Luper, and others, would ever have been conceived.

Still, the chorus of boos against sensitivity over the years has become deafening. This prompted us to bring together well-known epistemologists to consider and reconsider the principle, taking into account previous criticisms (sometimes answering them), presenting new problems, refining the principle to meet various demands and objections, and recasting the principle in novel ways to avoid various difficulties with subjunctives. Our hope is that this volume sparks renewed interest in sensitivity, perhaps restoring it to the throne of principles in externalist epistemology. Our fear is that oppositional voices in this volume succeed in dismantling sensitivity where numerous previous critiques have failed. We have our own opinions about whether the hope or the fear is likelier to be fulfilled, but we leave it to the reader to decide. To point you to the chapters herein of most personal interest, we offer the following synopses.

1 DEFENSES, APPLICATIONS, EXPLICATIONS

Perhaps the best-known and most damaging criticism of sensitivity is that it appears to violate the principle that knowledge is closed under known entailment: schematically, that, for all S, p, and q, if S knows that p and knows that p entails q, then S can come to know that q by making the relevant inference. In "Nozick's defense of closure," Peter Baumann reminds us that Nozick was neither oblivious to the supposedly negative consequences of sensitivity's closure violations nor lacking in suggestions about how to reconcile sensitivity with a more sophisticated principle of closure. Working toward a revised closure principle, Baumann begins with a thought made famous by Dretske (1970), namely, that the sentential operator 'S knows that' does not penetrate, through known entailment, to conclusions that are presupposed in knowledge of the premises. He then shows how Nozick's own view on closure – that knowledge "goes through" to known entailments only when belief in the (known) premise also tracks the truth of the conclusion – is similar in spirit to the presupposition view, and is also distinctively Nozickean. Toward the end of his chapter, Baumann explores how Nozick's closure principle fairs

in handling well-known problem cases and considers the relationship between Nozick's theory of knowledge and this revised closure principle.

In their contribution, "Sensitivity meets explanation: an improved counterfactual condition on knowledge," Peter Murphy and Tim Black defend an enhanced sensitivity condition on knowledge, which they call explanationist counterfactualism. They argue that this condition answers the main objection to sensitivity theories – the aforementioned closure violations. Several prominent philosophers, including Ernest Sosa, Saul Kripke, and Timothy Williamson, have leveled this sort of objection by presenting cases in which sensitivity is supposed to force us to deny very obvious instances of the closure principle. Murphy and Black argue that sensitivity, at least when it is enhanced in the way it is in explanationist counterfactualism, is not threatened by these objections. In demonstrating this, they challenge attempts to show that sensitivity accounts of knowledge must be incompatible with the closure principle; epistemologists need not, in an effort to preserve closure, abandon the prospects for developing an account of knowledge that involves sensitivity. Murphy and Black conclude by suggesting that an enhanced sensitivity condition can help to bring into focus some crucial issues that arise in the debate over skepticism.

Sandy Goldberg's chapter, "Sensitivity from others," explores the requirements of sensitivity in testimony cases. Goldberg shows how different knowledge verdicts can be generated by different ways of characterizing testimonial methods, which spawn variant readings of the sensitivity property itself. Building on insights from Peter Graham's (2000) analysis of testimonial knowledge, Goldberg argues that the best, but by no means perfect, individuation of testimonial belief-forming methods is rather specific, involving reference both to the speaker and to *her* process of forming belief. Goldberg also argues that the difficulties remaining for sensitivity, once one takes into account belief-forming methods, are common to all modal epistemic principles, and thus should not be taken as damaging to sensitivity in particular.

Lars Bo Gundersen has argued for a dispositional account of knowledge (2010). In his contribution here, "Knowledge, cognitive dispositions and conditionals," he explores well-known counterexamples to the subjunctive conditional analysis of dispositions – cases that include "masked," "mimicked," and "finkish" dispositions. In such examples, there is a mechanism that either changes the dispositional properties of an object or overrides them in some way, apparently falsifying the conditional analysis. It turns

out that counterexamples to Nozick's sensitivity account of knowledge typically have the same features as the counterexamples to the conditional analysis of dispositions, raising some questions: can the conditional analysis be satisfactorily amended, and if so, do those amendments naturally apply to the sensitivity conditionals? Or, should dispositions be regarded as basic, unanalyzable by conditionals? Gundersen argues that the supposed counterexamples do not comply with two independently motivated principles that any *genuine* counterexample to the conditional analysis – either of dispositions generally or of knowledge – must satisfy. He concludes that, together with the principles, Nozick's epistemology survives in good standing.

In "Methods and how to individuate them," Kelly Becker offers an account of belief-forming methods that he takes to capture the spirit of Nozick's original proposal. Some commentators have criticized Nozick for pairing a broadly externalist epistemology with an internalist individuation of methods. Nozick claimed that methods are determined by their "upshot in experience" and that "any method experientially the same, the same 'from the inside', will count as the same method." However, in the very same paragraph, Nozick wrote: "A person can use a method (in my sense) without proceeding methodologically, and without knowledge or awareness of what method he is using" (1981, 184–85). Becker aims to reconcile the tension in these remarks, and he shows how the results provide the basis for replies to well-known proposed counterexamples to sensitivity.

II CRITICISM

Given the resilience of sensitivity, those who wish to reject sensitivity theories will try to uncover criticisms in addition to the several counterexamples that have been proposed and to the allegation that sensitivity forces us to deny closure. In the second section of the book, three prominent epistemologists – Jonathan L. Kvanvig, Jonathan Vogel, and Peter Klein – offer novel criticisms of sensitivity theories or steer extant criticisms in new and different directions. In "Truth-tracking and the value of knowledge," Kvanvig asks whether modal epistemologies – in particular, epistemologies that feature probabilistic approaches to sensitivity – can explain the value of knowledge. He argues that they cannot. Still, he maintains that such approaches go some distance toward explaining why knowledge is more valuable than mere true belief. In addressing other value problems, however, such as the problem of explaining why

knowledge is more valuable than any combination of its proper subparts, sensitivity-based approaches show less promise. While they can make significant contributions to the solution of value problems – for example, by telling a plausible story about why knowledge is more valuable than true belief for certain types of cognizers – Kvanvig argues that they do not in the end provide a complete solution.

Jonathan Vogel extends and deepens his twenty-five-year critique of sensitivity in "The enduring trouble with tracking." Building on previous work, Vogel provides counterexamples to argue that sensitivity encounters problems with knowledge of conjunctions, higher-order knowledge, knowledge that the source of one's belief is accurate, and inductive knowledge. The difficulties for sensitivity with higher-order knowledge and knowledge that one's belief source is accurate arise because some propositions have contents whose natures *ensure* that the sensitivity principle cannot be satisfied. With respect to inductive knowledge, Vogel offers a diagnosis of sensitivity's failure that is similar to one of the main lessons from John Greco's chapter (this volume; see below): evaluation of the sensitivity conditional sometimes requires reference to what S would believe in worlds different from the actual world to such an extent that they appear to be irrelevant to whether S actually knows.

In "What makes knowledge the most highly prized form of true belief?," Peter Klein distinguishes between epistemologies concerned with the etiology of beliefs, which include sensitivity theories, and epistemologies concerned with the reasons we have for our beliefs, which include defeasibility theories. Etiology views put constraints on the etiology of beliefs in order to eliminate epistemic luck and thus guarantee that beliefs are of the most highly prized form. The reasons view, on the other hand, characterizes luck in terms of defeaters of one's reasons-based justification, where the absence of defeaters ensures a non-accidental link between belief and truth, which guarantees that a belief is of the most highly prized form. Klein maintains that etiology views such as sensitivity theories crumble under the weight of a serious objection: they presuppose dubious empirical claims, such as the claim that the cause of an initially insensitive belief *changes* when we discover good reasons which convert that belief to knowledge. In addition, Klein argues, sensitivity theories can circumvent certain objections by relying on the reasons view, which can help them, for instance, in characterizing the belief-producing mechanisms to which they appeal. He concludes that the quality of our reasons, rather than the etiology of our beliefs, makes knowledge the most highly prized form of true belief.

III IN FAVOR OF SAFETY OVER SENSITIVITY

The third section of the book comprises essays defending the relative merits of safety over sensitivity. Safety says that a true belief is knowledge only if, throughout close worlds where S believes that p, p is true. This is, of course, a rough characterization. In earlier work, Duncan Pritchard (2005a) considered the idea that safety is both necessary and sufficient, together with true belief, for knowledge. One question, then, is whether the formulation above is understood better as necessary and sufficient (together with true belief) for knowledge, rather than as just necessary. A second question is whether S's belief that p must be true throughout *all* close worlds in which she holds that belief, or *most* (or, for that matter, *almost all*). A final, related issue concerns how far out in the space of nearby worlds one's belief must be true, and how to measure that space.

Pritchard begins his paper, "In defence of modest anti-luck epistemology," with reflection on knowledge-precluding epistemic luck and argues that the principle of safety is better suited than sensitivity to eliminate such luck. He favors a modest rather than robust anti-luck epistemology, where modesty says that the safety principle is only necessary for knowledge. In the course of his defense of safety, Pritchard responds to the objection that it can handle both inductive knowledge and lack of knowledge in lottery cases only by equivocation – specifically, only by furnishing conflicting answers to the second question in the previous paragraph. Pritchard argues that careful attention to the way that epistemic luck can undermine knowledge provides the key to a consistent and satisfying construal of safety, and then goes on to respond to other counterexamples extant in the literature.

The point of departure for John Greco's contribution, "Better safe than sensitive," is Edward Craig's (1990) examination of the purpose of the concept of knowledge, a crucial aspect of which is to identify good informants. Greco argues that a good informant is one whose belief satisfies the safety principle rather than sensitivity. Safety always requires consideration of what the agent would believe *only* in close worlds, whereas in evaluating sensitivity, when p is a proposition that is false only in distant worlds, for example, the proposition *that I am not deceived by an evil demon*, we sometimes need to take into account what the agent believes in those worlds, which Greco argues is beside the point of identifying a good informant. Greco also offers suggestions about how to repair the sensitivity principle to make it more relevant to our epistemic concerns,

but then shows how the fixes merely make revised sensitivity equivalent to safety.

In "False negatives," Steven Luper, whose excellent edited volume, *The Possibility of Knowledge: Nozick and His Critics* (1987c), set the standard for work on Nozick's epistemology, carefully scrutinizes several modal epistemic principles, including both Nozick's adherence condition (were p true, S would believe that p) and his variance condition, which by itself has come to be known as sensitivity. (See note 1.) Luper exposes problems with adherence, which has received far less attention in the literature, and then investigates the variance (/sensitivity) condition. Luper argues, and gives examples meant to show, that Nozick was wrong to think that knowledge is incompatible with the relevant belief-forming method producing false negatives. Like Pritchard and Greco, Luper favors the safety principle, which he has been defending since his early paper (1984) on Nozickean sensitivity.

IV SENSITIVITY WITHOUT SUBJUNCTIVES

The final section of the book includes a critical commentary by Anthony Brueckner on Sherrilyn Roush's (2005) *Tracking Truth: Knowledge, Evidence, and Science*, a highly original reformulation of Nozick's sensitivity principle, together with Roush's reconsideration of closure, in which she replies to Brueckner's paper.

In *Tracking Truth*, Roush argued that sensitivity is not necessary for knowledge and that knowledge of logical truths in particular is not susceptible to a sensitivity analysis because there are no possible worlds where those propositions are false. Roush argued that if S's belief that p is sensitive and S knows that p entails q, then S can know that q without being sensitive to it – without tracking it. If this is right, the strategy also allows the sensitivity theorist (broadly construed) to uphold the closure principle.

In "Roush on knowledge: tracking redux," Brueckner discusses some problems for Roush's sensitivity-based account of knowledge, centered primarily on concerns regarding Roush's account of knowledge of logical truths and implications. First, he maintains that a central element of her account, namely, its requirement that one be properly responsive to the relation between a proposition, q, and a proposition, p, that is logically implied by q, fails to say anything at all about one's epistemic relationship to the proposition that q logically implies p. He also maintains that Roush's account of knowledge lacks the resources to explain how one can

know that certain skeptical hypotheses, such as the hypothesis that one is a brain in a vat, are false. In addition, Brueckner argues that Roush's account has trouble handling some of the more forceful objections to the original Nozickean account, including Alvin Goldman's (1983) dachshund case, the lottery-style puzzles discussed by Vogel (1999) and Hawthorne (2004), among others, and the problem of bootstrapping (see Vogel 2000), which involves making one's way to knowledge of the reliability of a belief-producing mechanism via an illegitimate inductive inference.

As Roush responds to Brueckner's concerns, in her chapter "Sensitivity and closure," she defends an account of knowledge that includes a sensitivity condition, achieves closure through a recursion clause, and rejects infallibilistic requirements for knowledge. Importantly, Roush elaborates her account of knowledge of logical entailments, claiming that, just as sensitivity captures the notion of responsiveness to empirical propositions, her account of knowledge of logical entailments illuminates how beliefs about the propositions in the entailment relation are responsive *to each other*, defending this view against Brueckner's claim that responsiveness is epistemically irrelevant. As a fallibilist, Roush claims that this responsiveness need not be perfect. She recognizes, however, that such a view has a problem with the growth of error: when there is a certain potential for error in S's belief that q and a certain potential for error in her belief that q implies q′, and when S believes that q′ on the basis of her beliefs that q and that q implies q′, there is a greater potential for error in her belief that q′ than in her belief that q. While perhaps not a serious problem where S tracks q and knows (in the relevant sense) that q implies q′, the potential for error mushrooms as the number of fallibly known implications grows. This also threatens Roush's account of closure, since according to it S might know (by tracking) q, know (without tracking) that q entails q′, know (without tracking) that q′ entails q″, but not know q″ because the potential for error has grown too large.

To circumvent both the growth-of-error problem and the related closure problem, Roush now argues that S must track each premise in a chain of logical entailments: "You must … be no more than one implicational step away from a proposition that you track if you are to count as knowing" (253). Closure is maintained and growth of error declawed. In her original take on Nozickean tracking, Roush helps us to see just how versatile and resilient sensitivity can be, perhaps especially when it is put to use in ways its early advocates might never have imagined.

PART I

Defenses, applications, explications