KNOWLEDGE AND LOTTERIES
For Sean, my son
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I have learned most of what I know about epistemology from three people. At graduate school William Alston taught me how to find my way around the subject, serving up numerous insights and useful distinctions that have stayed with me. In the mid-1990s Stewart Cohen revived my interest in epistemology and helped me get much clearer in my thinking about three related topics: contextualism, epistemic closure, and skepticism. At that time and since, we have had many discussions about knowledge that have benefited me greatly. More recently I got to know Timothy Williamson, who through his written work and conversation has helped my thinking enormously. I am extremely grateful for having had the opportunity to learn from these people.

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CONTENTS

1. Introducing the Puzzle .................................. 1
2. Contextualism and the Puzzle ......................... 51
3. Skeptical and Moderate Invariantism ................ 113
4. Sensitive Moderate Invariantism ..................... 157

References ................................................. 193
Index ...................................................... 201
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I INTRODUCING THE PUZZLE

1.1 A Puzzle

This monograph is organized around an epistemological puzzle, one that has received increasing attention in recent years. Its attention is well deserved: first, it affords an excellent entry point into some of the most intriguing questions about the verb ‘to know’; and second, it generates considerable embarrassment for much of the epistemological theorizing of the last fifty years. In essence, the puzzle consists of a tension between various ordinary claims to know and our apparent incapacity to know whether or not someone will lose a lottery.

Here is a blunt statement of the problem. Suppose someone of modest means announces that he knows he will not have enough money to go on an African safari this year. We are inclined to treat such a judgment as true, notwithstanding various far fetched possibilities in which that person suddenly acquires a great deal of money. We are at some level aware that people of modest means buy lottery tickets from time to time, and very occasionally win. And we are aware that there have been occasions when a person of modest means suddenly inherits a great deal of money from a relative from whom he had no reason to expect a large inheritance.

But despite all this, many normal people of modest means will be willing, under normal circumstances, to judge that they know that they will not have enough money to go on an African safari in the near future. And under normal circumstances, their conversational partners will be willing to accept that judgment as correct.²

However, were that person to announce that he knew that he would not win a major prize in a lottery this year, we would be far less inclined to accept his judgment as true. We do not suppose that people know in advance of a lottery drawing whether they will win or lose.³ But what is going on here? The proposition that the person will not have enough money to go on an African safari this year entails that he will not win a major prize in a lottery.⁴ If the person knows the former, then isn’t he at least in a position to know the latter by performing a simple deduction?

Are we to say that he doesn’t know the relevant fact about his future vacations? Or are we to say that, after all, one can know that one will lose a lottery in advance of a drawing and without special insider information? The flaw in the following type of argument, if there is one, is not easy to identify:

S knows that S won’t have enough money to go on a safari this year.

If S knows that S won’t have enough money to go on a safari this year, then S is in a position to know that S will not win a major prize in a lottery this year.

² An early discussion of the puzzle is provided by Gilbert Harman: ‘we might infer and come to know that we will be seeing Jones for lunch tomorrow even though our total view includes the claim that Jones does not win the lottery (e.g., because if he won he would have to be in Trenton tomorrow to receive his prize and would not be able to meet us for lunch)’ (1973: 161). I discuss the surrounding text in Ch. 3.

³ Unless they do not own a ticket.

⁴ Or at least does so when combined with certain obvious facts such as that an African safari does not cost nearly as much as a major prize in a lottery. Such fussing hardly gets to the heart of the problem. One can easily rewrite the ordinary and lottery propositions respectively so that the entailment is strict; e.g.: ‘S will not have enough money to afford a very expensive vacation any time soon’ and ‘Not: S will soon win a major prize in a lottery and thereby have enough money to afford a very expensive vacation’.
Hence, S is in a position to know that S will not win a major prize in a lottery this year.

As a number of philosophers have noticed (in good part thanks to the work of Jonathan Vogel), the problem generalizes. For example: I am inclined to think that I know that I will be living in Syracuse for part of this summer. But once the question arises, I am not inclined to think that I know whether or not I will be one of the unlucky people who, despite being apparently healthy, suffer a fatal heart attack in the next week. (If only medical self-examination were so easy!) Indeed, I am just as unwilling to count myself as knowing about the heart attack as I am to count myself as knowing about the lottery.

The analogy continues. Just as I have excellent statistical grounds for supposing that any given lottery ticket will lose, I have excellent statistical grounds for supposing that a given apparently healthy person will not have a fatal heart attack very soon. Just as there was no special reason in advance for supposing that the winning ticket was going to win, there was no special reason in advance for expecting the worst for some heart attack victim who was apparently healthy. And just as many of our ordinary commitments entail that this or that person will lose a lottery, many of our ordinary commitments entail that this or that person will not soon suffer a fatal heart attack.

The cases that we have considered so far can be generalized further to cases not involving the future. Most obviously, one can consider cases in which some lottery drawing has already occurred but the winner has not yet been announced. But it is worth having some other cases involving the here and now explicitly in view, ones that do not involve lotteries per se.

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5 See, notably, Jonathan Vogel (1990), who to my knowledge was the first person to make vivid that the problem posed by lotteries is not an isolated oddity but is actually widespread.


7 Another example: Timothy Williamson notes in passing that ‘it is reasonable for me to believe that I shall not be run over by a bus tomorrow, even though I know that I do not know that I shall not be run over by a bus tomorrow’ (2000: 255). (See also Slote 1979: 180.) How, then, can I know anything about my future? In his otherwise synoptic book it is odd that Williamson does not address this problem.
So, for example, I am inclined to think that I know where my car is parked right now. But once the question arises, I am not inclined to think that I know whether or not I am one of the unlucky people whose car has been stolen during the last few hours.\(^8\) This obviously generalizes to all cases of non-observational beliefs: who the US president currently is (perhaps he died in the last five minutes), whether my refrigerator is running (perhaps there has been an electrical outage in my neighborhood), whether my football team won last night (perhaps there was a misprint in the newspaper).

Indeed, we need not even restrict ourselves to cases involving putative knowledge of unobserved objects or events; we can generate cases involving putative perceptual knowledge and lottery-style considerations.

First, a case that, while farfetched, vividly brings out the structure of the problem: A person takes a pill from a bucket of 10,000 pills. One of the pills induces blue-green color reversal—that is, it makes blue things look green and green things look blue—while the rest of the pills are inert. The pill-taker knows this. As it happens, he takes an inert pill that leaves his color perception mechanisms undisturbed. He looks at a blue patch and forms the belief that it is blue. We may well be inclined to count him as knowing that he is seeing a blue patch. And we will of course count him as knowing that the patch he is seeing looks blue. But we will be far less open to the suggestion that he can deduce and come to know that the pill he took was inert.\(^9\)

Next, a case with more general application: Suppose that there is a desk in front of me. Quantum mechanics tells us that there is a wave function that describes the space of nomically possible developments of the system that is that desk. On those interpretations of quantum mechanics according to which the wave function gives probability of location, there is some non-zero probability that, within a short while, the particles belonging to the surface of the

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\(^8\) Also from Vogel (1990).

\(^9\) The case described above is similar to one described in Vogel (1993: 238).
desk remain more or less unmoved but the material inside the desk unfolds in a bizarre enough way that the system no longer counts as a desk. Owing to its intact surface, the system would be reckoned a desk by normal observers. Call such a system a desk façade. I will be ordinarily inclined to think that I know by perception that there is a desk in front of me. But once the question arises, I will be far less inclined to think that I know by perception whether or not this is one of those unusual cases in which the desk recently developed into a desk façade. And, obviously, the example generalizes.

In each of these cases, the structure of the problem is the same. There is what we might call the ordinary proposition, a proposition of a sort that we ordinarily take ourselves to know. There is, on the other hand, a lottery proposition, a proposition of the sort that, while highly likely, is a proposition that we would be intuitively disinclined to take ourselves to know. And in each case the ordinary proposition entails the lottery proposition.

These considerations generate powerful pressure towards a skepticism that claims that we know little of what we ordinarily claim to know. For when confronted with the data, we philosophers feel a

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10 This raises the specter that nearly all counterfactuals of the form ‘If $p$ had been the case, $q$ would have been the case’ are false. After all, on standard semantics for counterfactuals, such a claim is true only if $q$ is true at all the closest worlds where $p$. Assuming the relevant quantum mechanics, it seems that for any nontrivial categorical description $C$, it will always be the case that a few of the closest $p$ worlds will unfold in a way that is nomically acceptable and which matches the past of the actual world but where $C$ doesn’t obtain. Note that if one tinkers with the semantics, requiring only that most of the closest $p$ worlds be $q$ worlds in order for the counterfactual to be true, then the logic of counterfactuals will have to be rewritten, since certain intuitively acceptable inference patterns will turn out invalid. A clue for solving the problem may be provided by David Lewis’s (1986a, postscript) discussion of ‘quasi-miracles’. I explore these issues further in Hawthorne (forthcoming b).

11 An analogous result holds for classical statistical mechanics: The region in phase-space associated with the macroscopic state of being a desk of that shape and material has a subregion of nonzero measure such that the Hamiltonian for any given point in the region will plot a path of evolution that will yield a desk façade in a short while. (Thanks to Frank Arntzenius here.)

12 The term ‘lottery proposition’ is Vogel’s (1990: 17).

13 Or near enough. See n.4.

strong inclination to stick to our judgment about the lottery proposition and retract our original judgment about the ordinary proposition. Indeed, lottery-style considerations are arguably a more dialectically effective tool for the skeptic than standard brain in a vat or deceiving demon thought experiments. While many contemporary philosophers are inclined to resist the skeptic by claiming that they can, after all, know that they are not brains in vats, they are not nearly so eager to embrace the claim that they know they will lose a lottery for which they hold a lottery ticket. And once this has been conceded, it is extremely hard to justify a different attitude to the other ‘lottery propositions’ that figure in the above examples.

Moreover, those philosophers who see their way to embracing the claim to know the relevant lottery proposition will find themselves quickly embarrassed by conjunction introduction. Suppose I hang tough and claim that since I know I will be spending part of the summer living in Syracuse, I know I will not be one of the unlucky heart attack victims, and that since I know I will not be able to afford a safari, I know I will not win the lottery. Well, if I can know such things about myself, I can presumably know such things about my friends as well. Consider 1,000 such friends. If I know of each of them that they will lack sufficient resources to go on an African safari, then I can know of each of them that they will not win a lottery. But assuming that I can extend my knowledge by conjunction introduction, I can now know of all of them that they will lose. But that is crazy: soon enough, by such methods, I will take myself to know of a large chunk of lottery ticket-holders that they will all lose and of a sizeable chunk of the population that they will all be free from fatal heart attacks. (And if there are 1,000 lottery

15 Cf. Richard Feldman, who notes that ‘The typical response, at least among my students and non-philosopher friends, is to find preposterous the mere assertion that one does not know one is no brain in a vat’ (1999: 100).

16 That is to say, if $f_1 \ldots f_n$ are my friends, I will know that the conjunction $f_1$ will lose and $f_n$ will lose is true. To know, say, the universally quantified claim that all of my friends of modest means will not win requires an extra bit of knowledge (one that may well be readily available), namely that the list $f_1 \ldots f_n$ exhausts the list of my friends of modest means.
ticket holders, 999 of which are my friends, I can even know the winner by deduction!) In an effort to prevent us from knowing too little, the anti-skeptic risks allowing that we know too much.

Faced with this dilemma, even those who initially resisted may find themselves inclined towards a skeptical reaction. People don’t really know that they will not be able to afford extravagant things in the near future, or where they will be in a few hours’ time. People don’t really know that their cars are parked in the garage, or who the president currently is. People don’t really know that they are not looking at desk façades, tree façades, and the like. I am by no means fully convinced that the skeptical reaction is the wrong one. But, for reasons that will become clear in Chapter 3, I do suspect that it is the wrong one. And for the most part, the present monograph will be investigating non-skeptical solutions to the puzzle. The remainder of the present chapter will be devoted to appropriate ground-clearing and stage-setting. First, I shall try to say something more about why we are inclined to think that lottery propositions are unknowable. Second, I shall link those unknowability intuitions to certain other intuitions concerning our assertoric and deliberative dispositions with regard to lottery propositions. (This will help us later, in Chapter 2, to articulate some plausible ground rules for solving the puzzle.) Third, I shall discuss the topic of epistemic closure, which is vital to the force of the puzzle, and which also yields a constraint upon any acceptable solution.

1.2 The Lottery Proposition

In each of the cases described above, the puzzle depended upon what I called a ‘lottery proposition’. Examples: I will not win a

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17 Of course, they may well try to soften the blow by allowing that one knows that one will probably not have a fatal heart attack and so on. Be that as it may, on the most straightforward version of this view, nearly all positive knowledge claims are false, as are the beliefs that ordinary people express by them. Skeptical views will be discussed in detail in Chapter 3.
major prize in a lottery this year; I will not be one of the unlucky people to have a sudden and unexpected fatal heart attack. In each case, the lottery proposition is true. In each case the epistemic subject under consideration has good reason for being confident that the lottery proposition is true—the lottery proposition is highly likely relative to the person’s evidence. And yet I take it as a datum that there is a strong inclination to claim that the relevant lottery propositions are not known. Nor is this merely a datum about the inclinations of philosophers. After all, the motto of the New York State lottery is ‘Hey, you never know’.\(^\text{18}\)

What is it about lottery propositions that generates the inclination to say we don’t know them? It cannot be their logical strength. After all, the proposition that I will not win a major prize in a lottery this year is logically weaker than the proposition that I will not have enough money to go on an African safari this year: the latter entails the former, but not vice versa. Nor is it a matter of their truth value or justificatory status: lottery propositions that we claim not to know may be both true and well justified. So what does explain our disinclination to reckon them known?

That there is a widespread inclination of this sort is uncontroversial. It is a far more delicate matter to identify its source. Let us begin with some preliminary observations. First, the relevant intuition does not depend vitally on there being a guaranteed winner.\(^\text{19}\) Change the lottery scenario so that there is some chance of there being no winner at all—suppose, for example, that some tickets are always unsold and their numbers always inserted into the draw—and the inclination to say that one does not know one will lose remains unchanged. Nor does it depend crucially upon the fact that each ticket has an equal chance of winning: change the scenario so

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\(^\text{18}\) This epistemic feature of lotteries is the key to its widespread figurative deployment. Consider: ‘Freud puts forward the suggestion that Marriage, in the stories discussed, may be symbolised by a lottery. You never know who you’ll end up with and what life will result. The idea that “life is a lottery” is a subliminal metaphor that lies deep in the European mind and forms a kind of template for an outlook on the world’ (from the Freud Museum website: <www.freud.org.uk>).

\(^\text{19}\) DeRose (1996: 570).
that some tickets receive different weightings than others and the relevant intuition is unaffected. Nor does it depend crucially upon the fact that the epistemic subject under consideration has merely statistical reasons for believing that he or she will lose the lottery. If someone believed that she would lose the lottery not on the basis of statistical reasons, but by simple deduction from the premise that she would not have enough money to go on an African safari in the near future, that would hardly alleviate our disinclination to ascribe knowledge of the lottery proposition to her.

It should also be noted in passing that a number of popular ‘analyses’ of knowledge do especially badly at predicting our reactions to the lottery case. If we possessed some implicit standard of knowledge according to which knowledge is true justified belief, or true belief produced by a highly reliable belief-forming mechanism, or true belief supported by good evidence, then we would expect a positive epistemological verdict with regard to any true belief that a ticket in a (sufficiently large-scale) lottery is a loser. In effect, lottery cases all by themselves give us pretty good reason for rejecting many of the accounts of knowledge that have been offered in recent decades. At the very least, one should not be hopeful that such analyses will help much by way of explaining our epistemic intuitions with regard to lottery cases. These points are especially worth taking to heart in the case of reliabilism, which is today regarded by so many philosophers as the key to answering skepticism. Unless we can find our way to discarding the relevant intuitions in lottery cases, we will not be well placed to use reliabilism as a safeguard against skeptical arguments.

Let us pursue another tack. Suppose someone believes that \( p \). Following recent usage, let us say that such a person sensitively

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21 Contra Nelkin (2000).
22 Notice that Gettier’s (1963) targets fall prey to lottery cases as well.
23 For more on reliabilism and closure, see Vogel (2000). For a good introduction to the varieties of reliabilism, see Goldman (1986). Goldman (1979) and Dretske (1971) have been especially influential. See also Armstrong (1973).