Modal Insurance: Probabilities, Risk, and Degrees of Luck

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I. Introduction

In his article, "Anti-Luck Epistemology and the Gettier-Problem," Duncan Pritchard sets out to defend his modal account of luck (Pritchard 93-111). In this view, lucky events are those which obtain in this world, but which fail to obtain in a wide-class of nearby possible worlds in which the initial conditions are set. Pritchard provides several reasons for why we should accept the modal view over its competitors, the control view and the probability view. Chiefly, he argues, the modal theory of luck 1) allows for degrees of luck, and 2) associates luck with risk. I will attempt to argue against this claim by suggesting that the probability theory of luck is better able than the modal theory to meet these challenges, and that it better handles exemplary cases of luck like those brought up by Pritchard.

Pritchard begins by outlining what is meant in advocating for the modal theory of luck. The brief sketch he provides, which is consistent with his account elsewhere, tells us that lucky events are those events which obtain in this world, but do not obtain in a wide-class of nearby possible worlds in which the same initial conditions are set (Pritchard 96). For instance, he says, our winning the lottery is a lucky event because in almost all nearby possible worlds we would fail to do so. In the same way, if we imagine a person who is almost struck by the bullet of a sniper bent on assassinating them (say it came within an inch of them), this person is surely lucky, as the bullet would probably have struck them in a wide-class of nearby possible worlds. In this way, Pritchard argues, the modal account seems to capture our intuitions about luck in what we would take to be exemplary cases of it. Yet, what other theories are on offer to compete against the modal account?

Other than the modal theory of luck put forward by Pritchard, the two major competitors to this view are the control theory of luck and the probability theory of luck. In the first view, which Pritchard spends little time on in his discussion, an event is lucky if it is significant for an individual and outside of their control. In this way, winning the lottery can be said to be lucky as the winner had no control over the outcome, and it would certainly be significant for most. To further aid the control theory, it seems intuitive enough to suggest that, were the winner to have control over the outcome of the lottery, it would diminish our willingness to attribute luck to their winning it. This so far seems reasonable. On the other hand, in its simple form, the control theory of luck may lead us to accept more than a few somewhat absurd conclusions. For instance, as Steven Hales has pointed out, it is surely significant for us that the gravitational constant is what it is, and the setting of the gravitational constant was outside of our control if anything was, but does this lead us to believe that we are lucky that the gravitational constant is what it is (Hales 494)? Hales provides a wide range of other equally strange conclusions we might be forced to accept under the control view, but they will not be mentioned here.

The final theory of luck we will, and Pritchard does, discuss is the probability theory. In this account, an event is lucky if it is significant, and improbable. Thus, if an event has a less than fifty percent chance of obtaining, and is significant for someone, it is lucky for that person. It is clear how this account is able to accommodate the lottery example, as winning the lottery is an exemplary case of an unlikely, or improbable, event. Better still, if the winner of the lottery were to have controlled the outcome, this would be visible in the probability of their winning it, and thus the probability theory is also able to track our failure to call their winning the lottery in that case a lucky event. What, then, is the problem with the probability theory in Pritchard's view?

II. Significance & Degrees of Luck

The first reason Pritchard gives us to discount the probability theory of luck is that while it seems to capture the luck operative in the lottery case, it produces the wrong results when we fail to win the lottery. He writes: "notice… that for most lotteries it's *both* the case that one's winning is a matter of luck *and* that one's losing is also a matter of luck (good luck in the first case, bad luck in the second). And yet in the latter case the event in question is a high probability event" (Pritchard, "Anti-Luck Epistemology" 97). What can be said in defense of the probability theory? While it may be likely for a person to lose the lottery, it is ultimately a matter of chance. In this way, probability theorists tend to distinguish luck (as a type of chancy event) from mere chance (Coffman 385-398). If these events, which have a greater than fifty percent chance of obtaining and are significant to us, are merely chancy, what accounts for Pritchard's intuition that losing the lottery is a case of bad luck?

In the probability account, the significance of an event obtaining plays an important role in addition to its probability. This interaction, between significance and probability, is an interesting one, and it is one that may be responsible for throwing off our intuitions. For instance, if we were to imagine that the aforementioned lottery presented participants with a one in a million chance of winning $500,000,000 and we grant, as Pritchard asks us to, that losing is a case of bad luck, would we be willing to further grant that losing a lottery offering the same amount of money with a one in one thousand chance of winning is worse luck? It seems like the answer would have to be "yes." Of course, in this example we have increased the probability of the lucky event occurring, which should in turn be reflected in the breadth of the class of nearby possible worlds in which we won. In this way, changes in probability alone can't arbitrate competing intuitions. On the other hand, imagine that we lost a lottery with a one in one million chance at winning, but the prize was only one dollar. Surely, if we are granting that losing a lottery is a case of luck, this case is towards the better end of bad luck. At the same time, neither the modality nor the probability of the event obtaining has been altered.

While it may be enough to say that the significance condition in the probability theory of luck is able to explain this shift, whereas the modal theory is not, there may be something deeper at play. Our attributions of probability are notoriously prone to bias. In one study, similar to our discussion of lotteries, participants were asked at what dollar amount they would forgo a chance at winning a large monetary prize (Rottenstreich and Hsee 185-190). Researchers found that when the prize was affect-rich ($500 towards a summertime European vacation as opposed to towards their tuition), participants overestimated the odds of an unlikely win and underestimated the odds of a likely loss. While the probability theory of luck allows for significance to alter the relative luck attributable to an event, significance can also sneak in the backdoor of our estimates of probability. In this way, we might have further reason to think that attributions of luck in the case of likely events are tracking poor estimates of probability that go along with high significance rather than modal fragility. Put more plainly, the lottery loser who attributes their loss to bad luck is likely overestimating the likelihood of their odds of winning it in the first place.

In line with this defense of the modal account is a problem brought up by Steven Hales. In order to tease out where modality and probability come apart, he offers us the example of near miss in Russian roulette (Hales 492). Given that only one chamber of a six-shot revolver has a round in it, the odds of winning are five in six (a likely outcome), but if we imagine that the chambered round is the one adjacent to the one we land on, then we might reasonably feel lucky for having missed it. In this way, while probability theory should not declare this victory lucky, because it is modally fragile, the modal theory should. To make the import of this case more clear, Hales asks us to consider a maximally large revolver, with a googolplex of chambers and still only one bullet (Hales 492). In this case, the odds of landing on the chambered round are incredibly low, yet, if we landed on the chamber next to the bullet, our victory was still modally fragile.

The first thing that we ought to mention when discussing this case is that it seems to be declaring our winning lucky on the basis of our intuitions about a subclass of ways in which that event might obtain (a near miss). For instance, the probability of our winning in a game involving a six-shot revolver and only one round is 5:6 (likely) and, for that reason, our winning would not be considered a case of luck according to the probability theory. However, while we might reasonably think ourselves lucky if the bullet was contained in the chamber adjacent to the one chosen, we seem to have altered the probabilities. The probability of a near miss in this case is 2:6 (it could appear on either side of the chosen chamber). Thus, in the case of a near-miss, the probability theory accommodates the intuition that the event is lucky. This distinction is amplified, not worsened, in the case of the maximally large revolver. A win in a game involving a revolver with a googolplex of chambers and only one round can be assigned the odds of (10^100)-1:10^100 (an incredibly likely event), but a near miss might be a paradigmatic case of luck according to the probability view because the odds of that event obtaining are a staggering 2:10^100. It seems that it would be a mistake to employ our intuitions about near-misses in a discussion about whether we ought to consider wins lucky.

A further response to this problem, should we still feel that a win is a lucky event, is to say that our willingness to attribute luck in this case is another instance of simply misattributing what is actually a combination of immense significance and mere chance. However, given that the odds are so dramatically in favor of winning, it seems unlikely that the intuition motivating a luck attribution is reducible to extremely poor, and motivated, estimations of probability. Rather, it might be that in the folk use of the term “luck,” we often utilize the word in instances of mere significance. For example, would we still be inclined to attribute luck in this case if the googol chambered revolver merely poked the loser rather than fatally wounding them? While the situation is still modally fragile, without the significance condition that is built into the probability theory, modal attributions of luck seem to not be able to get off of the ground. It may be that a revised theory of modal luck, which includes a similar significance condition, could better explain the difference at play here, but modifying Pritchard’s theory of luck could come at great consequence to his larger project in epistemology. Rather, as Hales points out, it may be more likely that our attributions of luck do not conform to a singular and clear concept. Nevertheless, given that only the probability theory is capable, in its current form, of explaining the difference between a poke and a mortal accident in Russian roulette, we have reason to think that, insofar as there might be some clear and singular concept of luck, probability theory stands the better chance of illuminating it.

It is also important to note that, as we have seen in tinkering with the cases in question, luck seems to be capable of coming in degrees. Pritchard takes this to be an argument in favor of the modal theory, as it is quite good at explaining why a near miss is less lucky than an even nearer one, but is it alone in doing so? As we have seen already, probability offers us an exceptionally good way of quantifying degrees of luck, as a one-in-a-million lottery win is much luckier than a one-in-a-thousand. Further, because probability and significance can both come in degrees, probability theory is better able to explain a wider range of variation in degrees of luck. Even the troubled control theory could, in principle, offer us degrees of control which would in turn influence degrees of luck (should a proper theory of control be worked out). In this way, an account of luck should be able to accommodate degrees of luck, but the modal theory's ability to do this is not unique.

III. Luck & Risk

The final argument offered in support of the modal theory of luck is that it excels as a theory insofar as it attests to the deep relationship between luck and risk. To say that the target of an assassination is luckier having missed the bullet by an inch than having missed it by a yard is to say that, in the first case, they were at greater risk than in the second. Risky events, just like lucky events, are those that are modally fragile. Pritchard takes this connection to be relatively deep, and he argues that "our judgements about risk are thus tracking the degree of luck in play" (Pritchard, "Anti-Luck Epistemology" 98). Yet, is this deep connection between luck and risk really evidence in favor of the modal theory?

Estimations of risk in the world are, perhaps, most commonly associated with insurance. People take out insurance to protect themselves in proportion to their perceived level of risk, and insurers set insurance rates according to their perceived level of exposure. If our judgements about risk are tracking the degree of luck involved in an event's obtaining, and luck is a measurement of modal fragility, we ought to expect insurance to be calculated in terms of modality. Rather than this, we tend to find that insurance is, itself, deeply connected to calculations and estimations of probability. On the other hand, it could be argued that these probability estimates are an attempt to quantify an event's modal fragility. How, then, do we arbitrate the case of insurance?

Imagine that we reached out to an insurance company to protect us in the event that a few unlikely instances obtained. Luckily for us (or for the company), this insurance firm employs infallible actuaries who always perfectly calculate the probability of given outcomes in order to determine payment rates. Suppose that we ask the company to insure us against a more modally close event and a more modally distal event; in the first case we seek protection from the damages associated with being struck by lightning, and in the latter, we want to be insured in the event that we are bitten by two giraffes simultaneously while snow-skiing. Assume, also, that we expect to be paid out the same amount of money if either event should obtain. The company's actuaries return, having sufficiently reviewed all relevant background information, and tell us that upon examining your lifestyle the probability of both events obtaining is exactly the same (one in seven hundred thousand). Yet, because the lightning strike was ruled to be more modally close, as our intuitions might suggest, the premiums for that plan will be one hundred dollars a month more than those associated with the giraffe attack. In Pritchard's account this discrepancy is reasonable, but what does it mean for determinations of risk if an event is more modally close than another, but being so does not render it any more likely to occur?

This example seems to map on to another brought up by Pritchard. In an effort to tease apart modality and probability Pritchard provides a case of luck involving risk. In this case, he argues that even if the odds of winning the lottery are calculated as the same as his winning gold in the next Olympic 100-meter sprint, one would be foolish to place a bet on the latter event obtaining over the former. This is because, in his account, much more about the world would have to change for the latter event to obtain than the former. Yet, if these probabilities are accurate, I would argue that it seems that one would be more foolish to think that one one-in-a-million bet is any riskier than another.

To better understand how this example might be misleading, consider how the odds of these events might be calculated. If we start from the assumption that the odds are, indeed, correct, and the Olympic win is justifiably set at a given probability, what accounts for the disproportionately low odds of winning the lottery? Pritchard tells us that all that would need to change about our world in order for him to win the lottery is that "a few coloured balls need to fall in a slightly different configuration" (Pritchard, "Anti-Luck Epistemology" 97). Yet, if the odds are truly equivalent between this and the Olympic win, perhaps this is not the end of the story. Given that the world, and the lottery machine, is sufficiently deterministic, we might find that the only way to arrive at a lottery-winning configuration of colored balls is to have the machine draw 14.98 watts at the precise moment rather than the 15 it consistently draws, but what is necessary for this to occur? Perhaps a mouse could chew ever-so-slightly at the cord running to the machine so as to ensure only and exactly .02 watts are lost at just the right time, but to bring the closest nearby mouse into our world we would need to have the janitor not set a trap the night before. Unfortunately for us, the nearest world in which the janitor fails to set the trap is one in which he is forced in a witness-protection program after witnessing the attempted assassination from our earlier thought experiment. In this way, it seems that if the probability being calculated is, indeed, accurate, our willingness to attribute more modal fragility in the case of the lottery is a result of our insufficiently fleshing out exactly what changes to our world would be necessary in order to truly produce one-in-a-million odds.

On the other hand, it might be the case that Pritchard is right, and we are apt to take the Olympic bet over the lottery win, but surely in this case we have simply incorrectly calculated the odds. Probability simply seems to be an attempt at quantifying the breadth and nature of the class of nearby possible worlds. It is for this reason that we expect changes in lottery odds to go hand-in-hand with the amount of nearby possible worlds in which a win is obtained, and it is for this reason that Pritchard seems right that an amateur gold medal win in the Olympic 100-meter sprint is less likely than a mere lottery win. This likelihood would, in a truly infallible account of the relevant probabilities, result in two different calculations. Thus, we should grant, as Pritchard does, that in gambling we are right to be inclined to accept the more modally close event over the modally distal one. At the same time, truly divergent modalities should be reflected in the relevant probabilities, which in turn should allow the probability theory to explain the difference. Without the assurance of infallible actuaries, Pritchard is right to point out that the lottery bet seems like a better one than the Olympic bet, but this is simply to say that we have good reason to suspect that the equivalent probabilities are inaccurate. In this way, our actual (and fallible) insurance actuaries are performing a kind of modal calculation, by looking at the rate of events occurring in other cases where the initial conditions are sufficiently similar, but this should not motivate us to think that probability is a worse guide in estimating risk. Rather, calculations of probability present us with a useful way of quantifying how modally fragile an event actually is, rather than relying merely on our intuitions about modal closeness.

Here we have an error-theory which explains how we might be misled into thinking one genuine one-in-a-million bet is better than another, and an explanation which allows probability theory to capture what Pritchard thinks only the modal theory can. Further, if we imagine the case of the modal insurance company, or imagine asking the same company to insure us against our betting on the Olympic win or lottery win respectively, we can see that the probability theory of luck is sufficient to capture the deep association between luck and risk (even when this comes down to a matter of degree).

IV. Conclusion

In conclusion, Duncan Pritchard is right in arguing that the modal theory of luck is strong to the extent that it associates luck with risk and allows for degrees of luck, but it is not alone in doing so. Both the control theory and the probability theory are able to accommodate degrees of luck (with probability theory being better able to quantify them), and probability theory is, perhaps, better equipped to calculate risk in the real world than any competing theory. Finally, in the instances where modality and probability seem to come apart, and instances where merely chancy events seem to result in luck, we have found error theories which explain how and why our intuitions can be led astray. In the case of supposed likely lucky events, we may, in fact, be tracking poor estimates of probability motivated by our hopes of significant and affect-rich events obtaining. In the case of equally likely modally divergent events obtaining, we may simply be wrong about the probabilities of events, or under-describing the changes to our own world necessary in order for those events to occur. On this basis, the probability theory of luck seems to be quite capable of achieving any of the successes attributed to the modal theory, and in many instances, seems to better capture our judgments about exemplary cases.

Works Cited

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