Degrees of Luck

ABSTRACT Modal accounts of luck have been used both in epistemology and in ethics to clarify the concepts of knowledge and free will respectively. In this paper, I investigate whether such modal accounts of luck can do justice to the various ways in which luck comes in degrees. I argue that none of the considered formulations is fully satisfactory. I present suggestions for improvement and briefly mention some consequences of the points made in the paper.

Luck plays an important role in both in our daily lives and philosophical theory.[1] For example, Neil Levy argues that free will is incompatible with certain forms of luck, while Duncan Pritchard argues that certain forms of luck are incompatible with knowledge. But what is luck? Both Levy and Pritchard use a Modal Account of Luck (MAL).[2] The *locus classicus* of this account is Duncan Pritchard's Epistemic Luck (2005). Recently, however, Pritchard's views regarding the best way to formulate MAL have changed (2014). In this paper, I argue that none of these formulations of MAL accounts for the various ways in which luck comes in *degrees*.

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[1] For some example in ethics, see (Levy, 2011; Williams & Nagel, 1976). For some examples in epistemology, see (Goldberg, 2015; Pritchard, 2005)

[2] That is not to say it is uncontested, of course. See for example (Goldberg, 2015; Hiller & Neta, 2006; Lackey, 2008)

I then present some suggestions for improvement, and briefly mention some consequences of this way of thinking about luck.

1. The Modal Account of Luck

In the classical formulation of MAL, luck is subject to two conditions, individually necessary and jointly sufficient for an event to be lucky:

> (L1) If an event is lucky, then it is an event that occurs in the actual world but which does not occur in a wide class of the nearest possible worlds where the relevant initial conditions for that event are the same as in the actual world. (Pritchard 2005: 128)

> (L2) If an event is lucky, then it is an event that is significant to the agent concerned (or would be significant, were the agent to be availed of the relevant facts).[3] (Pritchard 2005: 132)

(L1) is meant to express our intuition that lucky events could have easily failed to occur. This intuition is brought out by paradigmatic cases of luck such as finding a treasure in one's yard by randomly digging a hole. Random digging seldom turns up a treasure, so this event could easily have failed to occur. If we modify the case,

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[3] The addition of the modal clause complicates this condition considerably. What are the relevant facts, what does it take to be availed of them, and how to determine what an agent would find significant in counterfactual situations? I will not attempt to answer them: the clause is intended to capture cases where the event is clearly significant to an agent, but where the occurrence of the event is unknown. It is still a matter of luck for me that a meteor missed my house by some meters, even if I am unaware of this. I *would* find this significant, were I availed of the relevant facts.

such that I could not have easily failed to find the treasure, for example because I buried it myself some days ago, we would no longer regard the event as lucky.

The above indicates that lucky events could have easily failed to occur. But this is not yet very clear. How are we to interpret this easy possibility? Pritchard uses a standard possible world framework.[4] On this view, how easily an event could have occurred is determined by the modal distance between the nearest possible world where the event occurs and the actual world. Modal distance is understood "in the standard way … in terms of a similarity ordering." (Pritchard, 2014, p. 596). Thus, the more similar a world is to ours, the more easily possible the events that occur in that world are.[5] Lucky events are thus events that fail to occur in worlds similar to our own.[6]

(L2), on the other hand, expresses the fact that lucky events tend to have some significance. (L2) is required, according to Pritchard, because there could be some events that satisfy (L1) but that we would not consider to be lucky, such as small avalanches occurring at the South Pole, or the wind on Mars creating dunes in the shape of a heart. If no sentient being accords any significance to the event, it is not a matter of luck, it seems.

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[4] Pritchard seems to draw primarily on Lewis' seminal work (Lewis, 1973, 1986).

[5] Similarity is another notion that is less than clear. What makes two worlds similar to each other? Lewis and Pritchard both take this notion to be primitive. I'll follow their usage and rely on our intuitive understanding of degrees of similarity.

[6] That is not quite accurate: only the nearby worlds where the 'relevant initial conditions' for the event are the same as in the actual world are relevant for luck. More on this below.

2. First Way: Modal Distance

Luck is a gradual notion: events can be more, or less lucky. Pritchard accommodates this fact in the following way:

> [D]egree of luck involved varies in line with the modal closeness of the world in which the target event doesn't obtain (but where the initial conditions for that event are kept fixed. (Pritchard, 2014, p. 600)

This is a plausible account of some differences in degree of luck. I am more lucky to survive when the sniper's shot misses me by an inch, than when it misses me by a foot. Pritchard can explain this difference in degree of luck: the nearest world where I get hit is more similar to the actual world in the first case than in the second. Let us call this the first way in which luck comes in degrees.

There are various other ways, however, in which luck seems to come in degrees. In what follows, I shall provide an overview of these other ways, and argue that they cannot be satisfactorily accounted for by MAL. Along the way I provide some suggestions for improvement.

3. Second Way: Significance

Degree of luck depends on the significance of the event in question. If I do not care at all for the music of Justin Bieber, it is not a matter of luck for me that he decides to give a surprise concert at my house. If I think his music is amazing, I am highly lucky that he comes.

Significance is a matter of degree, and so is luck. Sometimes, degree of luck depends on degree of significance. For example, I am more lucky to roll a six if my life depends on it than when it just wins me a game of Risk. The relatively high degree of luck of the former event is explained by its relatively high significance. Let us call this the second way in which luck seems to come in degrees.

We said above that Pritchard imposes a significance condition on luck. In his most recent formulation of MAL, however, Pritchard abandons any such requirement (2014). The main reason for this change seems to be that

> [w]e shouldn't expect an account of the metaphysics of lucky events to be responsive to such subjective factors as whether an event is the kind of thing that people care about enough to regard as lucky. (2014: 604)

The quote brings out that Pritchard (2014) wants to restrict his analysis of luck to its metaphysics. These metaphysics — that lucky events share a modal profile in that they all could have easily failed to occur — have been part and parcel of the Modal Account of Luck since its inception. What seems to have changed, however, is that Pritchard (2014) thinks that the significance of an event is relevant for our *judgments* about luck, not for the presence of luck itself.

I think there are a couple of reasons for resisting this view, and thus for re-adding a significance clause to MAL. The first is that it seems to be significance specifically which sets luck apart from other modal concepts like coincidence or accidentality. Insignificant events like small avalanches at the South Pole, or heaps of sand on Mars forming certain patterns could be coincidental, but not lucky, it seems. For

example, The Oxford English Dictionary defines luck as "the fortuitous happening of an event favourable or unfavourable to the interest of a person." On standard usage of the concept, lucky events need to have significance.

A second reason for thinking luck implies significance is that luck is an agent-relative: the same event can be lucky for me but not for you, and vice versa. For example, my lottery win can be lucky for me but not for you, if you also bought a ticket. A natural explanation is that the event has positive significance for me, but not for you. Importantly, the difference does not, as Pritchard maintains, merely concern our *judgments* of luck: even impartial observers would judge me to be lucky here but not you. An account that focuses on the modal profile of the events only cannot accommodate this property of luck.

I take these to be compelling reasons for including a significance condition in one's account of luck. Without it, one cannot explain why I am more lucky to roll a six when my life depends on it than when it just wins me a game of Risk.

4. Third Way: Modal Proportions

The third way in which luck seems to come in degrees is brought out by the following otherwise identical cases:

> C1: Winning requires Jill to throw a six. She throws a six and wins.

> C2: Winning requires Joe either to throw a six or a one. He throws a six and wins.

Other things equal, it seems Jill is more lucky to have won than Joe. After all, there are (proportionally) *more* possible ways for Jill to lose than there are for Joe. Let us call this the third way in which luck seems to come in degrees.

The only determinant of degree of luck in the most recent formulation of MAL is the modal closeness of the nearest world in which the target event fails to obtain. However, I set up the cases in such a way that this distance is equal. To argue for this claim I will simplify matters somewhat and assume that physical similarity is the only determinant for modal distance. In particular, I will assume that the nearest world in which Jill loses is a world the die stops rolling a fraction earlier and so lands on one of the faces adjacent to the six. If we treat the cases equally, the same will be true for Joe. None of these faces is *either* a one or a six. Our cases would thus be equally lucky if the only determinant for degree of luck is modal distance. But they are clearly not, so modal distance cannot be the sole determinant of degree of luck.

Prima facie, Pritchard's earlier account fares better. For that account states that "as the width of worlds in which the event in question does not obtain recedes, then our intuition that luck is involved recedes with it" (2005: 130). On Pritchard's earlier account we could thus say that the *more* nearby possible worlds there are in which the target event fails to occur, the higher the degree of luck to which the event is subject. This would explain the difference between our dice cases, since it seems there are more possibilities for Jill to lose than for Joe.

There is a possible problem with this way of accounting for the difference in degree of luck, however. Pritchard seems to endorse a Lewesian picture of possible worlds.[7] On such a realist picture, we should distinguish uncountable many distinct nearby possible worlds.[8] For example there will be separate worlds for each slightly different location in which the die lands, each still close enough to count as nearby. If the die's coordinates can be represented by continuous variables, there will be at least infinitely many distinct nearby possible worlds where Jill throws a six, and there will similarly be infinitely many nearby possible worlds where she does not. The same in the case of Joe. On this conception we cannot simply say there are (proportionally) *more* distinct nearby possible worlds where Jill loses than where Joe loses. Perhaps for this reason, Pritchard (2014) refrains from talking about proportions of possible worlds altogether. So neither of Pritchard's versions of MAL adequately accounts for the difference in terms of luck between Jill and Joe.

Luckily, we can modify the modal account of luck in a number of ways to avoid this problem. One plausible solution would be to define a *probability* measure over the relevant possible world space. We would then be able to say that the difference in degree of luck between Jill and Joe is explained by the fact that the probability of Jill's win is lower than Joe's.

On this interpretation, degree of luck depends not just on modal closeness, but also on the probability of the event in question. This bring MAL closer to Nicholas

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[7] Pritchard is less than clear on what he considers to be the metaphysical nature of possible worlds. However, both the fact that he refers exclusively to Lewis' work and his examples suggest a realist interpretation.

[8] Lewis puts the number at $\beth_2$ (1973, p. 90).

Rescher's probabilistic account of luck (Rescher, 2001, 2014). On Rescher's account, (good) luck (λ^+) is a product of the significance of an event (Δ) and the probability that the event did *not* occur (1- p):

$$\lambda^+ = \Delta - \Delta(p) \text{ (Rescher, 2014, p. 624)}$$

We saw that a factor would have to be added to account for the fact that luck depends on modal distance as well. Here, I will not try to answer the question how these factors should be weighed against each other. I rest content with the qualitative claim that any account of luck should include them all.

Another possible way to resolve the present problem draws on recent work in modal semantics. Particularly relevant here is the recent interest in partially specified possibilities rather than maximally specific possible worlds.[9] On Lewis' conception possible worlds are *maximally specific* entities   complete alternate universes, or 'ways absolutely everything might have been'. Possibilities, on the other hand, represent ways particular things could have been, leaving much else undetermined. An example would be the possibility that I throw a six with a fair die. This possibility does not entail anything about the weather at the time of my roll, or the exact location of the die after it, whereas Lewesian possible worlds *would* be determinate in this regard.

Possibilities can be further refined. Thus, we may refine the possibility that I throw a six into the more specific possibilities that I throw a six while the sun is shining, and the distinct possibility that I throw a six and while the sun is not

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[9] Examples of such accounts are (Edgington, 1985; Holliday, 2015; Humberstone, 1981; Rumfitt, 2015)

shining. Perhaps possible worlds can be conceived of as the limit of such refinement. However, the possibility framework is compatible with the absence of any such limit. Thus, the possibility framework allows for possibilities that can be refined *without end*.

It is the fact that possibilities come at different levels of granularity that may prove particularly useful to the Modal Account of Luck in the present context. For different levels of granularity allow for different *numbers* of distinct possibilities. On the level of the number of eyes being thrown by Jill and Joe respectively, there are just six possibilities: the possibility of throwing a six, a five, a four, etc. On this level of granularity, thus, there genuinely are *more* possibilities for Jill to lose than for Joe, proportionally.[10]

Thus, while an account of luck in terms of Lewisean possible worlds would be problematic, the same need not hold for an account of luck that is formulated in terms of possibilities. The development of such an account is beyond the reach of the present paper, however, and so this suggestion is no more than a promissory note. What is important is that degree of luck depends on proportions of possibilities. Any adequate account of luck needs to account for this fact.

5. The Description Dependence of Luck

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[10] This strategy may require a non-standard treatment of the modal operators. For even if we just distinguish between, say p and not-p, there may still be uncountably many possibilities on this level of granularity if we have to count the possibility that p as a distinct possibility from the possibility that necessarily possibly p, or possibly necessarily p. Thanks to Barteld Kooi for bringing this to my attention.

Given a description of an event, there are thus three factors that influence degree of luck: significance, modal distance and modal proportions. However, the degree of luck to which an event is subject also depends on how we describe the event in the first place. This fact gives rise to a problem analogues to the problem of the reference class for probability theory, and shows us a subjective aspect of luck.

Degree of luck seems to depend on our description of the event in two ways. First, as we saw above, the level of granularity that we choose to describe the relevant possibilities will influence the degree of luck. There is a difference in degree of luck between Joe and Jill on one, relatively coarse-grained level of description, but not on a partition of the space of possibilities that is as fine-grained as Lewis would have it. So what distinct possibilities we recognise influences the degree of luck to which an event is subject.

Second, degree of luck depends on our description of the relevant initial conditions for the event. For example, if the relevant initial conditions for a lottery win are broadly specified (buying a random ticket, for example) the event will be lucky. If we specify them more narrowly it may not be a case of luck at all. Given that I bought *this* ticket, and given that the drawing system produced *this* number, I could not easily have lost.

That degree of luck depends on the specification of the relevant initial conditions is acknowledged by Pritchard:

If one includes in the initial conditions for the event the demand that the balls fall into the lottery machine in a certain way, then one will no longer generate the desired result that the event is lucky… (Pritchard, 2005, p. 131)

Given that degree of luck depends on the specification of the relevant initial conditions in this way, we may ask what the 'correct' relevant conditions for an event are. However, saying anything general here proves difficult. Instead, Pritchard assumes that we can "pick out such initial conditions on a case-by-case basis" (Pritchard, 2014, p. 599).

How do we pick out these initial conditions in each case? I would suggest that there is no principled set of initial conditions for any event, but that pragmatic and/or contextual factors determine our choice in this regard. This seems plausible for the lottery case: normally, we are not interested in the amount of luck required to win when one buys a winning ticket. Rather, our interests lie in the determination of the amount of luck involved when we win buying a random ticket. After all, when we have to decide to buy a ticket, we don't yet know which one will be the winning one.

On this latter interpretation, the notion of luck would resemble the notion of probability. According to what is known as the 'Reference Class Problem', the probability of an event depends on what we take to be the relevant reference class

for that event."[11] Since there does not seem to be an objective way of determining the 'correct' reference class for an event, it seems that there is no objective probability measure (Hájek 2007: 565). Interestingly, luck resembles probability in this respect. For as we saw, the degree of luck of an event depends on the specification of its relevant initial conditions. If it is indeed the case that there is no 'correct' set of relevant initial conditions to be picked out, that means there is no objective luck measure as well.

In the debate about probability, the reference class problem has led many to abandon an objective interpretation of probability. Perhaps a similar move is in order in the debate about luck. Pritchard (2014) says that "as philosophers our interest is ultimately not in our subjective judgements about luck as such … but rather in luck as an objective phenomenon" (2014: 605). The above considerations, however, indicate that as philosophers, our interest might also be in the relation between luck and probability. Chances are this will reveal a subjective aspect to the notion of luck.

6. Conclusions

In this brief essay, I argued that degree of luck depends on i) the significance of the even in question, ii), the modal closeness of the nearest world in which the event fails to occur, iii) the number of possible ways in which the event can fail to obtain,

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[11] See for example (Hájek, 2007; Reichenbach, 1949). Hájek traces the problem back to John Venn (1888). A more full comparison between these problems for luck and probability is called for. I hope to undertake such a project in the future.

and iv), our description of the event itself. I argued that none of the considered versions of MAL adequately accommodates all factors. In particular, Pritchard's most recent formulation of the account does not recognize the fact that that degree of luck depends on i) and iii) above. I argued that i) can be accounted for by adding a significance condition on luck, and iii) by either adding a probability condition, or by drawing on a different conception of the possibilities relevant for luck. I closed with the suggestion that iv) brings out a striking resemblance between the notions of luck and probability.

If what I have argued for is right, then this will have some important consequences for philosophical theories that draw on a notion of luck. For example, if luck comes in degrees, the anti-luck epistemologist, who says that knowledge is incompatible with luck, must specify whether she thinks there is any specific degree of luck that is still compatible with knowledge, and if so, what the threshold value would be. Further, our findings would indicate which specific factors influence the luckiness of our beliefs, and thus the matter of whether we have knowledge or not. The fact that some of these factors seem to be subjective would mean, finally, that whether we have knowledge or not could depend on how we describe the relevant events concerned. These are important consequences that merit further study. [12]

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