

Draft. Published in Synthese. Please cite the published version.

## In Defense of an Epistemic Probability Account of Luck

Gregory Stoutenburg

Abstract:

Many philosophers think that part of what makes an event lucky concerns how probable that event is. In this paper, I argue that an epistemic probability account of luck successfully resists recent arguments that all theories of luck, including probability theories, are subject to counterexample (Hales 2016). I argue that an event is lucky if and only if it is significant and sufficiently improbable. An event is significant when, given some reflection, the subject would regard the event as significant, and the event's *epistemic* probability, determined by the subject's evidence, is the only kind of probability that directly bears on whether or not the event is lucky. I conclude with some lessons that are applicable to probability theorists of luck generally, including those defending non-epistemic probability theories.

### **I. Three General Theories of Luck**

Several philosophers think that part of what makes an event lucky is that it is improbable (among them are Baumann 2014, Latus 2003, McKinnon 2013, Rescher 1995, Steglich-Petersen 2010, Stoutenburg 2015). The idea is easily illustrated: suppose I am walking down the street when I find a fifty-dollar bill laying on the sidewalk. No one is around. I am lucky to find (and keep) the money in part because finding money is unlikely. This straightforward explanation of why finding the money is lucky lends plausibility to a probability account of luck.

Not everyone is keen on a probability account of luck. Recently, Steven D. Hales has provided several putative counterexamples to all theories of luck, including probability theories

(2016). I will argue that one version of a probability theory of luck—an *epistemic* probability theory of luck—is able to withstand Hales’s objections. Epistemic probability theories of luck have recently been offered by Asbjørn Steglich-Petersen (2010) and in my (2015).<sup>1</sup> In this paper, I focus on showing that my preferred version, which connects degrees of luck and degrees of evidential support and significance, is not subject to Hales’s counterexamples. (Some of my arguments work *mutatis mutandis* for Steglich-Petersen’s account; I note where this is the case.) I conclude the paper with some general suggestions for probability theorists of luck.

The three types of theories of luck that Hales targets are these:

*Probability theory*: “an event is lucky or unlucky only if it is improbable” (p. 491)

*Modal theory*: “an event is lucky only if it is fragile—had the world been very slightly different it would not have occurred” (p. 491)

*Control theory*: “if a fact was lucky or unlucky for a person, then that person had no control over whether it was a fact” (p. 492).

Each of these theses, as stated, provides only a necessary condition on luck, not necessary and sufficient conditions. One obtains necessary and sufficient conditions by conjoining one of these conditions with a *significance* condition.<sup>2</sup> The correct understanding of significance is

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<sup>1</sup> Depending on how one interprets ‘probability account of luck’, Steglich-Petersen’s account may not be a probability account. The notion of probability seems to have no direct role in his analysis, which is stated in terms of knowledge. I discuss the details of his account in section three. In any case, Steglich-Petersen is certainly defending an *epistemic* account of luck: whether it is an epistemic *probability* account of luck is disputable.

<sup>2</sup> Hales acknowledges this. “[M]y concern here will be with what is added to the significance condition to have a complete theory of luck” (p. 491-2). Nevertheless, his challenges to theories of luck generally ignore the significance condition.

controversial.<sup>3</sup> It is generally agreed, though, that an event is lucky only if it matters—that is, only if it is significant. Even if one is persuaded that significance is not necessary for luck (cf. Pritchard 2014), the fact that so many theories of luck require a significance condition means that to defeat *all* theories of luck defended in the literature, Hales’s counterexamples need to work on *any* interpretation of significance.

But even when a proposed significance condition is combined with a probability, modal, or control principle it would be a stretch to say one thereby has a *theory* of luck. Several important details must be filled in. To illustrate, consider modal theories, which find prominent defenders in Pritchard (2005, 2014) and Levy (2011). They vary in their definitions of significance and the luck-relevant relation between an event’s obtaining in the actual world but not in many nearby worlds—two crucial elements of their theories—while both are modal theories. Pritchard denies that an event can be lucky if it occurs in more than half of nearby possible worlds with the same relevant initial conditions (2005; 2014 is silent about the threshold for luck). Levy allows this. What could be a counterexample to Levy may be answered by Pritchard, and vice versa.

This is just one example. Defenders of different views have argued for many distinctions to set their theories apart from competitors. Bearing this in mind, it appears that Hales is making a very strong claim: there are classes of counterexamples sufficient to refute *all* theories of luck, regardless of these differences. While some of these targets can avoid Hales’s objections by amending their accounts, I will focus on showing how a suitably construed epistemic probability

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<sup>3</sup> For example, Pritchard (2005) endorses what I call a counterfactual subjectivist significance condition, while Coffman (2007) endorses an objective significance condition. Pritchard recently (2014) denied that significance is necessary for luck. Ballantyne (2012) has the best discussion of significance in the literature.

account of luck successfully avoids all of Hales's objections.

## II. Three Types of Counterexamples

Hales presents three classes of counterexamples: cases involving lucky necessities, cases involving skillful luck, and cases involving diachronic luck. Although Hales gives several examples from each class, for the sake of brevity I consider only what I consider the most forceful of each.

Cases of *lucky necessities* are events the occurrence of which is lucky for a subject, but which had to occur. Necessarily true propositions are also lucky necessities: these are necessarily true propositions the truth of which is lucky for a subject. The existence of lucky necessities is intended to challenge any view of luck that closely connects an event's being lucky (or a proposition's being true) with there being a range of possibilities in which the event fails to occur (or in which the proposition fails to be true). Here is one example from Hales (p. 495):

Logical Bandit: A bandit appears and threatens you with a gun. He will take your wallet unless you answer a logic puzzle correctly. The bandit gives the details of the puzzle. You have no idea what the answer is, so you guess:  $2/3$ . By luck, you guessed correctly. The bandit goes away.

Since mathematical truths are necessary, Hales concludes that probability, modal, and control accounts are all unable to explain why this intuitively lucky guess counts as luck. Given the puzzle the Bandit offered, the answer was necessary, even though it is lucky for you that you gave the answer that you did, since you easily could have guessed differently. Hales argues that cases like this pose a problem for all theories of luck, because even if the world were slightly different, Lucky Necessities would still occur (or would still be true).

Cases of *skillful luck* are those that all theories of luck allegedly misclassify in different directions: either all theories classify the event as lucky when it is properly attributable to skill, or all theories classify the event as non-lucky when it is indeed lucky. Here is one example of the former sort (p. 498):

Cobb: Ty Cobb holds the record for best career batting average at .366. Given that average, for any particular at-bat, it was improbable that Cobb would then get a hit. Even when Cobb does get a hit, he fails to do so in most nearby worlds with the same relevant initial conditions. Cobb is not completely in control of whether he gets a hit. Thus, the probability, modal, and control accounts all dictate that Cobb was lucky to get a hit when he got a hit. But intuitively, when Cobb got hits, it was because of his skill, not luck.

The problem of *diachronic luck* highlights the fact that our attributions of luck sometimes depend in part upon whether we consider the event in isolation at one time or whether we consider that event in relation to other events at other times. Hales argues that all theories of luck ignore that fact, and thus are subject to this class of counterexamples. Here is one such case (cf. p. 505):

Williams: Micheal Williams scored 97 free throws in a row before missing. His free throw percentage was .868, so each individual throw was probable. Plausibly, the modal account suggests that the nearest worlds in which he missed any given throw were not terribly close. Williams also had lots of control over each throw, as demonstrated by his remarkable ability. So, no individual shot was lucky. But on his 79<sup>th</sup> score he broke the old record. He was lucky to

make that shot.

Hales's intuitions about which subjects are lucky or non-lucky are initially plausible. For example, I agree that all modal and control accounts and some probability accounts need to find a response to the problem of lucky necessities. Regarding the modal account, it is well-known that knowledge of necessities is a tricky matter on safety analyses of knowledge.<sup>4</sup> Whatever method of belief-formation one chooses, if  $p$  is a necessary truth and one were to believe that  $p$  using that method, one's belief would be true. That is because what is necessarily true *would be* true under any circumstances. All necessities are non-lucky on a modal account since the event in question happens in all worlds ( $\neg$ proposition is true in all worlds), thus one cannot be lucky that the event occurs ( $\neg$ proposition is true). But intuitively, one can guess that  $p$  and be lucky that  $p$  is true, even if  $p$  is necessarily true.

Similar problems apply to some probability accounts, as Hales shows (p. 494). Theories that call an event lucky only if its occurrence is less than .5 probable clash with intuitions about certain cases. For example, someone playing Russian roulette with a standard six-chambered revolver is intuitively lucky to not die even though the *a priori* probability of being shot in the head is 1/6 (Rescher 1995).<sup>5</sup> An account of luck that delivers the correct verdicts about these cases will have to allow that an event can be lucky even though it is objectively very likely to

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<sup>4</sup> See Luper-Foy (1987), Sosa (1999), Williamson (2000), and Pritchard (2005) for defenses of safety principles. I am not claiming that the quick argument in the paragraph above refutes these views, only that a crude safety account is open to this objection and requires a response.

<sup>5</sup> That is not to say the epistemic probability of being shot in the head must be 1/6. The *a priori* probability of an event does not always equal the epistemic probability of the event. Perhaps I have evidence that the event is rigged: my friends, knowing that I am foolhardy but not wanting to hurt me, have not loaded the gun. They just want to see if I will pull the trigger. Or perhaps I have evidence that someone related to the event set-up has recently taken out a very large life insurance policy on me, and the gun feels a bit too heavy to be holding just one bullet. Such considerations could easily make the epistemic probability of death-upon-trigger-pull closer to or further from 1/6.

occur and that our luck attributions are variable in the ways highlighted by the Williams case.

### III. Epistemic Probability Accounts of Luck

Hales describes a probability account as one that accepts that “an event is lucky or unlucky only if it is improbable” (p. 491). There are many ways that one might understand the *kind* of probability that is relevant to luck, however, and it is crucial to distinguish them. There are two broad categories of probability accounts: objective accounts and subjective accounts (Broncano-Berrocal 2017). Objective accounts understand probability as determined by ‘features of the world’ rather than by degrees of confidence or agents’ evidence. Subjective accounts understand the kind of probability relevant to luck in terms of degrees of confidence or how likely an event is to occur on a subject’s evidence.<sup>6</sup> Hales’s Logical Bandit case provides a powerful objection to any objective probability account, which leaves a subjective probability account as the remaining option. Among subjective views, an epistemic account is preferable to a confidence account, as the only plausible relation that confidence bears to luck is as an effect of how probable an event is on a subject’s evidence.<sup>7</sup> Much more deserves to be said on behalf of these other views, but I will move forward to show how an *epistemic* probability account survives Hales’s objections.

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<sup>6</sup> The distinction drawn here between objective and subjective accounts is useful, but I am unconvinced that the divisions lie where Broncano-Berrocal suggests. Many epistemologists think evidential probabilities are *logical* truths, which suggests that they are *objective*, not subjective. And epistemological externalists characteristically take evidential relations to be contingent, determined by features of the world, which points toward categorizing that view of probability as an *objective* probability account. However, what counts as lucky for a subject according to an epistemic probability account depends upon what evidence a subject possesses, which tells in favor of treating any epistemic account as a *subjective* account, even if epistemological notions used to define the view are apparently ‘objective’ notions. In sum, take the subjective vs. objective division lightly. Also see footnote 14.

<sup>7</sup> One could specify a probability condition for a confidence account of luck that (i) defines how lucky an event is in terms of how confident the subject is that the event will occur and that (ii) claims that how confident one is that an event will occur is determined by one’s evidence. But that would just be an epistemic probability account with an unnecessary part.

The two epistemic probability accounts defended in the literature are (Steglich-Petersen 2010) and (Stoutenburg 2015). While I think that epistemic probability accounts of luck on the whole fare best against Hales's objections compared with all non-epistemic probability accounts and with all non-probability accounts, I will focus on showing how my preferred view can respond to Hales's counterexamples. Before I do that, I will briefly address Steglich-Petersen's account. Steglich-Petersen's probability condition states: "S is lucky with respect to E at t only if, just before t, S was not in a position to know that E would occur at t" (p. 369).<sup>8</sup> Clearly, on Steglich-Petersen's view, knowledge eliminates luck. Steglich-Petersen favors an interest-relative view of knowledge, one according to which knowledge is sensitive to practical factors, such as what is at stake for the subject (Fantl and McGrath 2009, Hawthorne 2004, Stanley 2005). When there is little at stake for a subject who believes that p, it takes less evidence for p and less confidence that p for S to know that p; but when there is much at stake for S if S believes falsely, then it takes more evidence for p and more confidence to know that p.<sup>9</sup> As he puts it,

On my own favoured account of knowledge, the truth of knowledge attributions depends on various features of the agent's practical situation, such as how much is at stake in case of error. For example, if little is at stake in case of error, standards for knowledge may be quite relaxed. Such relaxed standards make it harder for an event to qualify as lucky, on the epistemic account of luck.

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<sup>8</sup> As stated, this is only a necessary condition on Steglich-Petersen's view.

<sup>9</sup> This phrasing suggests that Steglich-Petersen holds that *knowledge* is directly affected by stakes. In the quote above, he claims both that *knowledge* and the truth of *knowledge attributions* are directly affected by stakes. Invariantists about knowledge attributions accept that "S knows that p" is true when S knows that p; so, it is unimportant whether we attribute to Steglich-Petersen a view about knowledge or about knowledge attributions.



(Steglich-Petersen 2010, p. 369)

There is a good reason to keep an interest-relative conception of knowledge out of one's account of luck. The connection between stakes, knowledge, and luck becomes crucially important for understanding *how* lucky an event is. Steglich-Petersen accepts that luck comes in degrees. He writes:

If an event is to count as lucky at all, the lucky agent cannot have been in a position to know that it would occur; but if the agent were almost in a position to know that it would occur, we might be inclined to say that although the event was lucky in the weak sense of satisfying the minimal requirement, it was not very lucky. On the other hand, if the agent were epistemically very far from knowing that the lucky event would occur, the event would be lucky to a greater degree. (Steglich-Petersen 2010, p. 369)

The trouble is that by incorporating an interest-relative account of knowledge into the analysis of the probability condition on luck, one abandons a straightforward connection between degrees of luck and strength of *evidential* support. Interest-relative accounts of knowledge hold that knowledge can be gained and lost by varying the stakes relevant to one's believing that *p* while one's evidence (and confidence) remain constant. Holding fixed an event's significance and evidential probability, the view that knowledge is interest-relative, when incorporated into the probability condition for luck, implies that how epistemically probable an event is can change with a shift in stakes *alone*. That is because how close a subject is to knowing that an event will occur determines how epistemically probable the event is and closeness to knowing is affected by stakes. So, on this view, stakes directly contribute to how epistemically probable an event is,

even without any change in evidence. That cannot be right: surely how *likely* an event is for you does not depend on how much is at stake for you—even if how *lucky* the event is *does* indirectly depend upon the stakes (perhaps because stakes affect *significance*). On the contrary, a core insight of an epistemic *probability* account of luck is that how lucky an event is depends directly on *how probable* the event is *conditional on a subject's evidence*.<sup>10</sup> Building an interest-relative account of knowledge into the account of luck requires rejecting those plausible, straightforward connections between the concepts of evidential support, epistemic probability, and degrees of luck. Whatever else one thinks of interest-relative accounts of knowledge, there are good reasons to keep interest-relativity out of one's probability condition for luck. It is better, I think, to directly connect how lucky an event is for a subject with how probable it is on the subject's *evidence*.

I will now describe my preferred epistemic account of luck before taking on Hales's arguments in the next section. The account accepts this probability condition on luck:

*Epistemic Probability Condition:* Event E is improbable to some degree for subject S if and only if immediately prior to E's occurring, S's evidence did not guarantee that E would occur.<sup>11</sup>

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<sup>10</sup> (Stoutenburg 2015, p. 328) contains a similar argument.

<sup>11</sup> In my (2015) I defined the condition this way: "Event E is lucky to some degree for subject S only when E was/is not epistemically guaranteed for S." My new formulation is an improvement for a few reasons. First, it is clearer to make temporal references explicit, as I do here. Second, the locution "epistemically guaranteed" that I used in my (2015) is slightly unfortunate, as one may reasonably object that when one knows that p, p is epistemically guaranteed for one. But if that view is combined with a view that allows that one's knowledge is constituted by factors in addition to belief and the probability of a proposition on one's evidence—as every fallibilist view *must*—then those accounts eliminate more luck than I think is plausible. So, it is better to state unequivocally that luck is possible whenever one's *evidence* does not rule out the event's occurrence. Third, I previously defined the probability condition as a necessary condition on *luck* rather than as a biconditional for analyzing *probability for luck*. I here define the probability condition as necessary and sufficient for probability for luck, and explicitly add that this biconditional and the significance biconditional jointly analyze luck. The view is the same, but the

Luck also requires satisfying this significance condition:

*Counterfactual Subjective Significance Condition:* Event E is significant to some degree for S if and only if, upon minimal reflection, S would value E's occurring.

Satisfying both conditions is necessary and sufficient for an event to be lucky to some degree for a subject. Let us call the account of luck that accepts these two conditions as individually necessary and jointly sufficient for luck the *Epistemic Analysis of Luck*, or EAL. A few expository remarks about these conditions are in order.

First, 'epistemic guarantee' here should be understood as epistemic probability 1.0. The epistemic probability that an event will occur is determined by one's evidence that the event will occur. One is *in a position* to know that the event will occur when and only when that event's occurring is 1.0 probable on one's evidence.<sup>12</sup> The view therefore allows that there may be events that are epistemically probable but count as lucky to some degree, specifically when the probability that the event will occur is between 0.5 and 1.0. That is a virtue: again, consider a

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presentation of the conditions is clearer here.

<sup>12</sup> First, Steglich-Petersen could, in principle, make the same claim. However, as I have argued above, incorporating an interest-relative conception of knowledge into one's probability condition for luck problematically separates an event's epistemic probability from how probable the event is on one's evidence.

Second, this account of luck implies a kind of infallibilist conception of knowledge, in that one knows that an event will occur or that a proposition is true only when one's evidence guarantees it. Infallibilists about knowledge have been a minority for a while, but are starting to reappear, especially thanks to the defense of infallibilism in (Williamson 2000). Nevertheless, infallibilist conceptions of knowledge are a minority view.

Third, one might argue that a proposition being certain on one's evidence is insufficient for knowledge, perhaps because one must also not be subjected to higher-order defeat of the sort that may occur in a case of peer disagreement. The issue is difficult and a serious treatment is beyond the scope of this paper, so I will simply state my preferred view without arguing for it. I think that if one really has evidence that *guarantees* the truth of a particular proposition, then one is justified in rejecting further evidence against that proposition, including higher-order evidence like testimony from a disagreeing peer (Unger 1975). If one were to encounter further evidence, including higher-order evidence, that really did reduce the probability that the proposition is true, then one would not know the proposition, and it would be reasonable to say that one never did know it. I recognize that all of those claims are highly controversial. I should also point out that someone interested in accepting EAL but who does not want to accept all of these claims about knowledge could respond to the concern about defeat by simply conceding that certainty on one's evidence is insufficient for knowledge. I thank an anonymous referee for encouraging me to discuss this issue.

Russian roulette win. An epistemic account of luck respects the intuition that there can be probable lucky events.

Second, the Epistemic Probability Condition is compatible with different accounts of evidence and what it is for an event (or proposition) to be probable on one's evidence.<sup>13</sup> All the account requires is that a subject's evidence is what determines epistemic probabilities for the subject. A subject's evidence includes facts accessible to the subject upon reflection, including the subject's experiences, knowledge, and justified beliefs.<sup>14</sup>

Third, satisfying either the Epistemic Probability Condition or the Counterfactual Subjective Significance condition *without the other* does not make an event lucky to any degree whatsoever. An event must satisfy *both* conditions to be *even a little* lucky. And how lucky an event is is determined by how probable the event is on the evidence plus how significant it is.

Fourth, events can be positively or negatively significant for a subject. For an event to be positively significant, and thus a candidate for *good* luck, S must *positively* value E's occurring;

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<sup>13</sup> Those sympathetic with an epistemic analysis of luck will likely let their metaepistemological views determine their analyses of epistemic probability for luck. One might be an actual frequentist reliabilist and understand 'E makes probable P' in terms of the actual frequency of events described by P happening when E in the actual world. E.g. the probability of a coin toss landing heads is .5 if, in the actual world, coins land heads half of the time they are tossed. (Cf. Alston's 1988 reliable indicator theory of justification.) Or one might be a transglobal reliabilist and understand E making probable P as a matter of the percentage of E-worlds that are P-worlds among worlds very much like ours as far as experience is concerned (cf. Henderson and Horgan 2006). And so on. See Conee and Feldman (2008) and Comesaña (2010) for discussion of the flexibility of evidentialist views in epistemology. The flexibility owes to the need to analyze 'evidence' and 'epistemic probability' in order to get a complete theory of justification. While I prefer the account described in the main text (and supplemented in the next footnote) to these alternative epistemic accounts, I still think that these epistemic accounts are superior to non-epistemic accounts of luck.

<sup>14</sup> In addition to an account of evidence, a fully worked-out epistemic probability account of luck needs an account of the evidential relation. I accept that the epistemic making-probable relation that holds between a body of evidence and an event (or proposition) is a logical relation. See Fumerton (1995), where a logical interpretation of probability is put to work for a theory of epistemic justification, and of course (Keynes 1921), where the idea is first proposed. I think that only a logical conception of epistemic probability can be used to satisfactorily address deep skeptical concerns (Fumerton 1995). However, one could in principle incorporate a different conception of probability into an epistemic probability account of luck.

for an event to be negatively significant, and thus a candidate for *bad* luck, S must *negatively* value (or “disvalue”) E’s occurring. An event may be positively or negatively significant for a subject without the subject positively or negatively valuing the event at the time it occurs, or a moment immediately prior: that is why the condition says that the subject would have the valuing attitude “upon minimal reflection”. It is difficult to precisely characterize “upon minimal reflection” outside of identifying definite boundaries. To require months of psychotherapy is too much, but one need not be prepared to do the needed valuing at a moment’s notice. One may even need further information in order to *discover* one’s valuing attitude toward an event.

Fifth, as a thoroughly subjective account, an event will not count as lucky *for a subject* if that subject would not find that event significant upon minimal reflection. There are counterexamples in the literature that aim to show that an event can be significant for a subject even when the subject does not value the event, or if the subject disvalues the event (Ballantyne 2012, Ballantyne and Kampa forthcoming). In such cases, the verdicts of objective and subjective accounts of significance diverge. Take the case of Rex the determined anorexic (Ballantyne 2012). Rex wants to shed an unhealthy amount of weight and so consumes only tap water. Unbeknownst to Rex, the water supply is infused with a nutritional supplement, and thus drinking the water frustrates Rex’s destructive goal. Ballantyne, who accepts an objective view of significance, says “[a] natural reaction is that Rex enjoys good luck”. That reaction may be natural, but it is not obviously correct. Fortunately, it is possible to explain our willingness to attribute good luck to Rex while accepting the Counterfactual Subjectivist Significance Condition. *At the time of the incident*, it was not lucky *for Rex* that Rex drank enhanced water. That is not what Rex wanted. If Rex were to find out about the water enhancement, he would likely be frustrated and consider himself to be unlucky. Intuitively, a person is *unlucky* for

occurrences that thwart that person's considered desires, not *lucky*, and it is to the benefit of a theory of luck that it can accommodate this. On a subjectivist view, Rex would be correct in thinking that he is unlucky. However, the rest of us may truly regard Rex as lucky: the Counterfactual Subjective Significance Condition permits that it *is* lucky *for those who care about Rex's health* that Rex drank enhanced water because those who care about Rex positively value his life and health. It would also *later* be significant and lucky *for Rex* if, looking back on the incident, Rex were to conclude that his desires were misguided, and to *then* be grateful and find significant that he maintained his health.

It is a strength of the account that it is able to offer a plausible error theory to explain conflicting judgments of significance. The error theory is that a false significance-attribution may seem true in cases when there are other closely-related significance attributions that are true. This error-theoretic explanation of diverging significance-attributions is preferable to the alternative Ballantyne offers, according to which there are two distinct *kinds* of interests: subjective interests and objective interests. On that view, Rex's objective interests are satisfied while his subjective interests are not. While that account fits the case, the error-theoretic explanation does too, and more parsimoniously.<sup>15</sup>

I now turn to argue that the Epistemic Analysis of Luck (EAL) avoids Hales's objections, noting along the way how a defender of Steglich-Petersen's epistemic account of luck could also reply.

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<sup>15</sup> One might further worry that my account requires too much cognitive sophistication of subjects like small children who are nevertheless intuitively beneficiaries of luck. Small children are more cognitively sophisticated than they get credit for, and consequently such objections are questionable, as I argue in (Stoutenburg 2017).

#### IV. How the Counterexamples Fail against EAL

Recall that Hales's three classes of counterexamples are lucky necessities, skillful luck, and diachronic luck. I will reply to a case from each class and show how EAL handles the objection.

##### *Lucky Necessities*

Consider Hales's logical bandit case. EAL handles this case with ease. You do not understand the puzzle, so the details of the puzzle that entail the correct answer are not included in your evidence. If the probability of the answer being  $2/3$  had been 1.0 on your evidence, you would have been in a position to know that  $2/3$  was the answer, and consequently not lucky to answer correctly. You clearly were not in a position to know the answer, since you had to guess. So, the probability condition is satisfied. And the event of getting the answer right, thereby keeping your life and your wallet, was significant. So, the significance condition is satisfied, too. Therefore, in keeping with strong intuition, your guess was lucky.<sup>16</sup>

##### *Skillful Luck*

Hales's Ty Cobb case is supposed to show that all theories of luck classify the case as "just plain luck" (p. 499) when Cobb's hits result from skill, not luck. EAL satisfactorily handles this case.

Three points are important here. First, luck comes in degrees. According to EAL, how lucky an

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<sup>16</sup> Steglich-Petersen's epistemic probability account can also handle the case as follows. The stakes for getting the answer correct are very high, which makes it difficult to know what the correct answer is. Since your evidence does not make it probable enough for you to know in this situation, answering correctly is lucky for you.

Note also that if some accepted principles of modal logic are interpreted as epistemic principles, with the 'necessity' operator interpreted as 'knowledge', then necessary truths should count as known because they are necessary. I reject that consequence, thus I also deny that these principles of modal logic describe the same property that we express when we use the word "knowledge", rather than some idealized epistemic property. This denial is motivated. For instance, traditional epistemologists overwhelmingly reject the principle that if one knows that p, one knows that one knows that p: but that principle is a straightforward application of the principle that if it is necessary that p, then it is necessary that it is necessary that p, given an epistemic interpretation. I thank an anonymous reviewer for prompting me to discuss this.

event is depends partly on how probable the event is on one's evidence. One might be just a *tiny* bit lucky with respect to some event even if the event's obtaining is overwhelmingly due to luck-irrelevant factors.<sup>17</sup> I am a relatively good typist. Characters appearing on the screen in a way I intend and anticipate is overwhelmingly due to my ability to type. Yet every time I strike a key, I am a little lucky that the key I struck caused a corresponding character to appear in my document. (I assume for the example that my keystrokes are significant, even though they generally are not.) My pressing a key is causally insufficient for the appearing of the corresponding character. For any particular successful keystroke, all sorts of things could go wrong, and I am not antecedently able to rule out the possibility of those things obtaining. A wire could come loose so no character is produced. I could accidentally change the computer's language to Arabic so that a different character appears. I could have a low battery that triggers a sudden automatic shutdown. And so on. So, I *am a little* bit lucky when my keystroke intentions are realized on the screen because prior to a given keystroke I lack evidence that enables me to know my intentions will be realized. Likewise for Ty Cobb: for any given at-bat, he lacked evidence that enabled him to know he would get a base hit. Even he should have been a little surprised whenever he got a base hit, given that he was in possession of evidence that made it straightforwardly *improbable* that he would get a hit. So, he *was* somewhat lucky whenever he got a hit.<sup>18</sup>

However, it would normally be shocking to call Ty Cobb "a lucky hitter". That brings me to the second point. We must distinguish conditions of *true* attribution of a property and

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<sup>17</sup> For a helpful discussion of ways to understand degrees of luck, see Church (2013).

<sup>18</sup> Steglich-Petersen's account could say the same thing: since Cobb could not know that any individual at-bat would be a hit, a hit is always a little lucky.



conditions of *appropriate* attribution of a property. Consider: I am running around the house looking for my son's toy dinosaur. I ask my wife: "Do you know where the dinosaur is?" She replies, with snark: "We don't have a dinosaur." That reply was conversationally *inappropriate* because it disregarded what we both know I was trying to get across, namely that I was trying to find my son's toy that shares some important features of a dinosaur writ kid-friendly. However, what she said is plainly *true*. There have never been dinosaurs in my house. When we think about the distinction between truth-conditions and appropriateness-conditions for luck attributions, it becomes clear what to say about Cobb. He is *somewhat* lucky every time he gets a hit, but it is rarely appropriate to say "Cobb was lucky." When we focus on the fact that for any at bat it was improbable that Cobb would get a hit, it is perfectly clear that there *is* luck involved. But it would usually not be appropriate for a reporter to ask Cobb, "How do you feel about having such a remarkably lucky batting average?" It is interesting, though, that even people whose successes are due far more to skill than to luck still sometimes call themselves lucky or thank God or others for their achievements.<sup>19</sup>

Third and finally, theorists have a decision to make when it comes to luck and attributability. We could say that when an event is lucky to any degree at all, then an individual crucially involved in the causal chain leading to that event is not to be given any credit for the event. Or we could say that some amount of attributability is compatible with some amount of

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<sup>19</sup> I take the fact that "You are lucky to X" and "I am lucky to X"—when they are attributions of the same property to the same individual regarding the same event *from different perspectives*—vary in communicative content to suggest that there is a negative *implicature* correlated with second-person and third-person luck attributions. We get offended if someone says we are lucky for something we think we have earned, even if we are prepared to attribute luck to ourselves. Given that evidence, it is a mistake to think there is an *entailment* from "You are lucky to X" to "You do not deserve credit for X," because, again, you might be willing to call *yourself* lucky while still thinking that you deserve credit.

luck, and that just what degree of attributability is compatible with just what degree of luck is a vague matter; or that they are compatible, but there is no vagueness because there is a threshold somewhere. Whatever we say, it should be perfectly obvious that Cobb was not *solely* responsible for *any* of his hits. A few other necessary conditions are calm air, pitches capable of being hit well, not being suddenly struck by lightning, etc. While we often speak as though some particular causally-relevant condition is '*the cause*' of some event, we know things are not so simple. J.L. Mackie pointed this out long ago (1974). We *say* the arsonist used gasoline to burn down the house, but many factors had to cooperate to make the house burn down. The arsonist and gasoline are salient in a way that other factors like air and matches are not—not to mention stranger events the non-obtaining of which was also causally necessary for the fire, such as the absence of water spewing from suddenly burst pipes, diluting the gasoline and thereby preventing the fire from starting. No fire chief hoping to stay employed will report that *the cause* of a house fire is the absence of burst pipes. But that report has just as strong a claim to truth as does "The arsonist caused the fire." The moral is that we should not be lured into thinking we have to choose between, on one hand, claiming that Cobb's swinging the bat is causally sufficient for his getting on base and thus that his hits are attributable to him, and, on the other, considering Cobb "just plain lucky" (p. 499) to get on base. The relationship between luck and credit is more complicated than that.

### ***Diachronic Luck***

Hales contends that our inclination to attribute luck to some events depends in part upon whether we consider the event in isolation at one time or whether we consider that event in relation to other events at other times. He contends that no theory of luck can accommodate the

diachronically varying judgments. While the judgments in question might initially *seem* to support the existence of diachronic luck, closer attention to which event is the allegedly lucky one, plus focus on the role of significance in luck, undermines Hales's conclusion. Here is how EAL handles Hales's example of Micheal Williams's free-throw record-breaking shot. For each individual shot, Williams was not in a position to know that he would make it. So, the probability on his evidence was not high enough to exclude luck. Note also that his free throw percentage, while high, was *only* .868, which means he missed over ten percent of free throws. But the Epistemic Probability Condition is only a necessary condition of luck. If each basket in the series was equally epistemically likely to go in, that does not by itself imply that each basket was equally lucky. Indeed, Hales is right that the record-breaking shot deserves to be called "lucky" in a way that earlier shots in the sequence do not. Here, the Counterfactual Subjective Significance Condition helps secure the intuitive verdict, because the 79<sup>th</sup> shot *was* more significant to Williams than the rest of the series. It *mattered* to Williams that he broke the record, and it mattered retrospectively a great deal more than the earlier free throws in the series. So, Williams' 79<sup>th</sup> consecutive free throw *was* luckier than those in the series before and after it.<sup>20</sup>

## V. A Few Lessons for Probability Theorists of Luck

There are a few brief lessons that probability theorists of luck, including those who reject EAL and any other epistemic probability account, can take away from this discussion.

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<sup>20</sup> Because Steglich-Petersen does not have a separate significance condition, his account, unlike EAL, is open to the problem of diachronic luck. Note, furthermore, that a counterfactual subjective significance condition is needed to account for the problem of diachronic luck, because only that sort of significance condition can account for how seemingly contradictory attributions of significance by a single individual to a single event at different times can both be true.

First: *avoid arbitrary probabilistic thresholds*. Strictly-speaking, an event is probable (on any analysis of probability) so long as the probability of the event occurring is 0.5 or higher. A probability theory of luck that requires an event to be less than 0.5 probable to be a candidate for luck is doomed to fail because there are lots of events that we consider lucky that are likely to occur. The Williams case nicely illustrates this. Solution: define one's probability condition so that an event is a candidate for luck whenever the probability of the event occurring is below 1.0. An objector will likely point out that the resulting probability theory may be far too permissive, which leads to the next lesson.

Second: *stress significance*. There are *two* necessary conditions on luck, not one. A probability theory (or modal theory, for that matter) that allows for the probability condition on luck to be satisfied in the way suggested above allows for many events to be *candidates* for luck, but most candidates never take office. If much of what happens is no significance to us, then those events are non-lucky. It is harder for a plausible accusation of being overly-permissive to succeed than it may initially appear. But what about when an event is *just a little* significant?

Third: *emphasize degrees*. If an event is just a little significant and just a little improbable, then it is *just a little* lucky. Consider the Cobb case. With so much that can go wrong for a batter, there is plenty of luck involved in being an overall, long-run successful hitter. There is nothing incoherent about the idea that Cobb's individual hits are so minimally lucky as to not deserve being called "lucky", even while his luckier successes do deserve to be mentioned: not because of a difference in kind—from non-lucky to lucky—but because of a difference in degree—from minimally lucky to highly lucky. (Compare, again, with the Williams case.) Here is an analogy. Young children love getting older and announcing that fact. When a stranger at the store check-out asks a four-year-old, "How old are you?" the chances of the kid answering

“four” are minimal, at least once he understands that years divide into quarters. When the child answers “Four-and-a-quarter” or “four-and-a-half”, what the child says is true, even though parents are more likely to simply say that the child is four because we think those genuine differences in degree are often not worth mentioning. We get *just a little* older all the time, but we need not commit to announcing our ages in years plus days. Only when those small changes add up to an extra year do we make note of it (or lie).

Fourth: *be permissive and lean heavily on your error theory*. Having said all of that, one should simply accept a permissive view of luck, as the Logical Bandit case suggests. The fact that luck comes in degrees should be emphasized by the permissivist, as it plays a crucial role in the permissivist’s error theory. The permissivist needs a way of explaining our ordinary reluctance to classify certain events as lucky, like in the Cobb case. As I suggested above, that can be done with principles of conversational pragmatics. Our utterances are expected to have a point. If luck is ubiquitous, then little is accomplished by pointing to one of many lucky events and calling it what it is. That does not imply that the luck-attribution is false, but it does imply that it would be strange to make without some goal in mind beyond reporting the mundane truth. A permissive view of luck, relying on these ideas, explains why we call some events lucky, but not others, even though there are lots of lucky events: we only bother to attribute luck to events that are *highly* lucky.

Fifth, *rethink the incompatibility principles*. Many philosophers have thought that the presence of luck undermines knowledge and credit for performing an action.<sup>21</sup> If a permissive

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<sup>21</sup> The entire literatures about anti-luck epistemology and the problem of moral luck presuppose incompatibility principles of the sort I mention here. Ballantyne (2014) and Coffman (2015) are critical of applying analyses of luck to concepts like credit and knowledge.

view is true, then there are two basic options concerning knowledge and credit. The first is to admit that there is very little that we know and very little for which anyone deserves credit. One who accepts such a view will likely offer an error theory for our over-permissiveness in attributing knowledge and credit, and that error theory will likely resemble the one I proposed in the previous paragraph. So, this austere option is on the table. The second option is to refine the incompatibility principles: a belief is unjustified *to the degree that* it is lucky—note that this is compatible with a fallibilist view of knowledge—and an agent deserves credit for an action *to the degree that* the action is non-lucky. On this option, the ubiquity of luck need not imply skepticism about knowledge or creditable action. Whether one prefers the first option or the second, further work remains to be done.<sup>22</sup>

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<sup>22</sup> I thank Brian Collins and anonymous reviewers for comments on drafts at various stages.

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