3B2v7.51c GML4.3.1 NIP : 299 Prod.Type:COM pp.1–28(col.fig.:NIL) ED:S.Gayathri PAGN: bvr SCAN:

ARTICLE IN PRESS

ELSEVIER

NEW IDEAS IN PSYCHOLOGY

New Ideas in Psychology ▮ (▮▮▮▮) ▮▮▮–▮▮▮

www.elsevier.com/locate/newideapsych

The psychology and philosophy of luck ☆

Duncan Pritchard[a,*], Matthew Smith[b]

[a] *Department of Philosophy, University of Stirling, Stirling FK9 4LA, Scotland, UK*
[b] *Department of Psychology, Liverpool Hope University, Hope Park, Liverpool L16 9JD, UK*

Abstract

There has been a great deal of interest in the concept of luck in the recent psychological and philosophical literature. In philosophy, this interest has tended to focus not upon luck *simpliciter* but rather upon the role that luck plays in ethical and epistemological debates concerning (respectively) moral and epistemic luck. In psychology, in contrast, a number of studies have explicitly examined our everyday conceptions of luck and the manner in which these conceptions influence our lives. This article surveys both the recent psychological and philosophical literature on this topic and argues that (to different degrees) the work of both disciplines in this area has been hampered by a failure to be clearer about what luck involves. Accordingly, this article offers a specification of what is core to the notion of luck and highlights how this analysis can aid further research in this area by both psychologists and philosophers.

Keywords: Causal attribution; Chance; Counterfactual thinking; Fortune; Illusion of control; Luck

0. Introduction

The concept of luck has been a central part of a number of recent discussions in both psychological and philosophical research. The latter has tended to discuss this concept in the light of two analogous debates in ethics and the theory of knowledge regarding the putative existence of, respectively, moral and epistemic luck. In

☆ Versions of this paper have been presented at the Psychology departments at the University of Stirling and at Liverpool Hope University, and we are grateful to the audiences on each occasion. We would also like to thank Philip Tetlock and, especially, Karl Teigen, for critical reaction to an earlier draft of this article. Finally, Duncan Pritchard would like to thank the Leverhulme Trust for the award of a 2-year Special Research Fellowship to conduct work in this area.

*Corresponding author. Tel.: +44-1786-467954; fax: +44-1786-466233.
E-mail addresses: d.h.pritchard@stir.ac.uk (D. Pritchard), SMITHM3@hope.ac.uk (M. Smith).

0732-118X/$ - see front matter © 2004 Published by Elsevier Ltd.
doi:10.1016/j.newideapsych.2004.03.001

contrast, discussions of luck in psychology have tended, unsurprisingly, to be of a more empirical nature, and have involved looking at the manner in which luck influences our perception of events and people. What is interesting, however, is that those involved in both camps of discussion have tended not to analyse the concept of luck itself, except to offer some very general characterisations of what might be involved in the notion. (Indeed, as argued below, there seems to be a number of competing concepts of luck at play in both the psychological and philosophical literature). It is argued here that psychological and philosophical treatments of luck have been marred by this failure to look more closely at the concept of luck itself. In particular, it is argued that there is an analysis of this concept available that is able to capture the core elements of the notion in such a way as to both accord with the most common elucidations of the notion and also accommodate elucidations that appear to run counter to this core proposal.

In Section 1, a critical survey of the main characterisations of luck in the philosophical literature is offered, along with a brief account of the ends to which these elucidations are put. In Section 2, the main empirical studies on luck in the psychological literature are also surveyed. In Section 3, an analysis of the core elements of the concept of luck is proposed and explained in the light of some of the issues raised in Section 1. Section 4 then employs this analysis of luck to cast light on some of the problems that emerge from the psychological treatment of luck discussed in Section 2. Finally, Section 5 offers some concluding remarks.

1. Philosophical treatments of luck

Most of the philosophical discussions of luck have been focussed upon the relevance of this concept to issues in ethics and, to a lesser degree, epistemology. The loci classici for the former debate in the recent literature is an exchange between Nagel (1979) and Williams (1979) on how luck undermines responsibility and thus, a fortiori, moral responsibility. Essentially, the concern raised is that there are morally relevant consequences of our actions which are due to luck, and that this undermines our moral responsibility for those actions. For instance, one example that is discussed by Nagel, and which has been the locus of a great deal of debate in the subsequent literature, is that of the drunk driver. Nagel asks us to compare two moral agents, both of whom drive home drunk, but only one of whom has the misfortune to kill an innocent bystander as a result. Nagel notes that our moral approbation of the 'unlucky' driver is far greater than our moral approbation of the 'lucky' driver, even though we are willing to grant, on reflection at least, that the only difference between the consequences of the two situations is a difference brought about by luck. It would appear then, argues Nagel, that luck has an influence on our moral judgements. Now one might respond to this sort of example by arguing that all it shows is that we should be more careful about our moral judgements by first being clear that the consequences at issue are not due to luck. But this will not do, contends Nagel, because there is a sense in which luck afflicts the consequences of *all* our actions since no matter how likely it was that what happened occurred in the way

that it did, there is always the logical possibility that events could have been different and different in such a way that can be described as being affected by luck.[1] We are thus faced with the dilemma of either abandoning the project of a luck-free system of moral assessment altogether (a system that Nagel and Williams attribute to Kant), or else radically revising our moral intuitions.

Of course, the issue here is not quite as clear-cut as this brief overview indicates. After all, one can push the point about different moral evaluations based on luck in a number of ways. For instance, one might argue that our everyday ascriptions of moral responsibility are radically in error and so should not be trusted in examples such as these. Alternatively, one might contend that, on reflection, our moral evaluations in such cases are equivalent and that they only seem different because the demands of a justice system typically require a victim (hence, on this view, both drivers in the example just offered are equally morally at fault, it is just that the unlucky driver ought to be subject to a legal sanction that outweighs that facing the lucky driver because it is only in the former case that there is a victim). Nevertheless, we need not engage too deeply with these issues since our aim here is not to resolve this debate but rather to gain a better view of how the philosophical literature in this regard employs the notion of luck.[2]

The employment of the notion of luck in epistemological discussion has run along similar lines, although the discussion has tended to fragment into several sub-disputes about the relationship between luck and knowledge. That is, the general thought found in the debate about moral luck has an analogue here, since the key concern about epistemic luck is how epistemic evaluations can coexist with the constitutive presence of luck at all. Interestingly, however, this general issue has tended to be treated as separate from the various sub-questions that have emerged regarding specific features of the relationship between knowledge and luck. Two such sub-questions are worthy of note in this regard—the issue of the status of the counterexamples to the classical tripartite account of knowledge famously proposed by Gettier (1963), and the issue of radical scepticism (the problem of whether we know anything much of substance at all).

In the former case it is taken as given in most of the recent literature that Gettier's counterexamples to the tripartite account work precisely because they show how this view of knowledge allows knowledge possession to be constitutively influenced by luck. In other words, it is simply taken for granted that luck cannot play an essential part in the acquisition of knowledge.[3] Dancy, for example, puts the point in the following matter-of-fact way:

> […] justification and knowledge must somehow not depend on coincidence or luck. This was just the point of the Gettier counter-examples; nothing in the tripartite definition excluded knowledge by luck. (Dancy, 1985, p. 134)

[1] Rescher (1995, Chapter 1) offers an extended defence of this point.

[2] For the main treatments of the issue of moral luck, see the papers contained in the volume edited by Statman (1993).

[3] For a survey of the main responses to the Gettier counterexamples, see Shope (1983).

The further issue of the exact manner in which luck and knowledge are incompatible, however, is rarely given any serious consideration.[4] The same is true in the case of radical scepticism. Again, it is often recognised that radical sceptical arguments gain their appeal by playing on the presence of luck in our everyday ascriptions of knowledge, but there is little analysis of the nature or role of luck as regards this issue that goes beyond this observation.[5] As with the case of moral luck, however, we need not dwell on the specifics of these particular debates, since our purpose here is not to adjudicate these disputes but merely to gain an overview of how they make use of the concept of luck.

Given that discussions on the topics of moral and epistemic luck fail to analyse the concept of luck insofar as it features in the debate in question, it should be unsurprising that they similarly fail to offer an account of luck *simpliciter* that is particularly informative or illuminating. Indeed, for the most part, philosophical treatments of the notion of luck have tended either to employ it as an undefined primitive or else merely gesture at a loose conceptual characterisation.[6] Foley (1984), Gjelsvik (1991), Hall (1994), Greco (1995), Heller (1999) and Vahid (2001) are all representatives of the former camp, since none of them offers an account of the notion at all in their discussions of luck-related topics. Other writers give the impression of offering some kind of elucidation of this notion but, on closer inspection, merely present unilluminating conceptual equivalences. Engel (1992, p. 59), for example, describes the notion of epistemic luck in terms of "situations where a person has a true belief which is in some sense fortuitous or coincidental", which is hardly helpful.

Of those that do attempt to offer a useful account of the notion of luck, one of the most standard approaches has been to define this concept in terms of the notion of an accident. Harper (1996), for instance, notes that "'luck' overlaps both with 'accident' and 'chance'", and Unger (1968, p. 158) cashes-out his anti-luck epistemology in terms of a clause which states that it is "not at all an accident that the man is right about its being the case that p". Morillo (1984) seems to adopt a similar line because throughout her discussion of the topic she uses the notions of

[4] An exception to this is Zagzebski (1994) (cf. Zagzebski, 1996, Part III; 1999), who is both clear about how, exactly, Gettier cases use the presence of luck to undermine the classical account of knowledge (by employing examples which involve a particular mixture of good and bad luck) and what conclusions should be drawn about the relationship between knowledge and luck (see, for example, Zagzebski 1999, p. 109). Zagzebski is very much the exception in this regard, however, and even she does not offer an analysis of luck itself.

[5] For some of the main texts on the problem of radical scepticism in the recent literature, see the volume edited by DeRose and Warfield (1999). See also the survey article by Pritchard (2002). One issue as regards radical scepticism that brings the putative incompatibility of luck and knowledge possession into sharp relief is that of infallibilism—the view that all *bona fide* knowledge is infallibly gained—and its relationship to the sceptical challenge. For the key text on infallibilism, see Unger (1975). A related issue in this regard is that of 'metaepistemological' scepticism, which can perhaps best be defined as a general luck-based scepticism about the theoretical adequacy of any possible anti-sceptical (and in particular *externalist*) epistemology. For the key texts in this regard, see Stroud (1994) and Fumerton (1995).

[6] Indeed, there is no real developed account of luck available in the philosophical literature, perhaps the closest thing being that offered by Rescher (1995) which is discussed below.

luck and accident interchangeably. For example, she notes (Morillo, 1984, p. 109) that knowledge precludes luck and then immediately goes on to say that it is for this reason that some analyses of knowledge demand that the truth of the belief in question should not be accidental.

There certainly is a close relationship between these concepts, but it is not nearly as close as some of these writers appear to imagine. Consider, for example, the paradigm case of luck—the lottery win. In such a case, it is a matter of luck (given the odds) that one wins the lottery, but it need not thereby be an *accident* that one wins (at least absent some further details about the scenario). After all, if one deliberately bought the ticket in question and, say, one self-consciously choose the winning numbers, then to call the resulting outcome an 'accident' appears conceptually confused.

Interestingly, Harper, in the quotation just cited, does not just group the concept 'luck' with the concept 'accident', but also with the concept 'chance'. This too, is a common way of characterising the notion of luck, with Rescher being, perhaps, the foremost exponent of a version of this thesis (see, for example, Rescher, 1995, p. 19). Again, however, although there is manifestly a close conceptual connection between the concepts, it is far from clear exactly how they relate. After all, the property of chance seems to apply only to events, and yet luck seems to attach itself more firmly to the individual affected by the lucky (or unlucky) event in question. For example, it may be a matter of chance that a landslide occurs when it does (or occurs at all), but if no-one is the least bit affected by this event (either adversely or otherwise), then it is hard to see why we would class this occurrence as lucky (or unlucky for that matter).

This issue is further complicated once one reflects on what the relevant understanding of chance is in this context. After all, events that have a low probability of occurring from the agent's point of view (such as a lottery win) are nevertheless plausibly regarded as predetermined to occur given the initial conditions of the situation and the relevant fundamental physical laws. With this in mind, it is not transparent that the relevant sense of chance at issue here should be understood in terms of low probability. Moreover, identifying chance with indeterminacy would fare little better since it ought to be uncontroversial that at least some lucky events are not brought about by indeterminate factors. It thus appears that a more subtle account of chance is needed.[7]

Another common way of characterising luck is in terms of control, or rather the absence of it. If I were to say that, for example, 'I discovered the buried treasure by luck', I would be naturally understood as implying that I did nothing to ensure that I would discover what I did (or, indeed, that I would discover anything at all)—that the discovery itself was out of my control in some way. This is, perhaps, the most common account given of the notion in the philosophical literature and its influence is probably due to the fact that in his influential paper on moral luck Nagel defines this species of luck in just these terms. Here is Nagel:

[7] Rescher (1995) is actually sensitive to these issues (though not others). We discuss his view in more detail below.

> Where a significant aspect of what someone does depends on factors beyond his control, yet we continue to treat him in that respect as an object of moral judgement, it can be called moral luck. (Nagel, 1979, p. 25)

Following Nagel, a number of writers have adopted this line as regards luck in general. Statman, for example, offers the following account of good and bad luck:

> Let us start by explaining what we usually mean by the term 'luck'. Good luck occurs when something good happens to an agent P, its occurrence being beyond P's control. Similarly, bad luck occurs when something bad happens to an agent P, its occurrence being beyond his control. (Statman, 1991, p. 146)

And a similar account is offered by Latus (2000). Nevertheless, both Statman (1991, p. 146) and Latus (2000, p. 167) also note, in footnotes, that lack of control could only plausibly be regarded as a *necessary* condition for luck. After all, as Latus (2000, p. 167) neatly points out, the rising of the sun this morning was an event the occurrence of which was out of one's control. But would we really want to say that it was *lucky* that the sun rose this morning? Moreover, the issue of control is particularly problematic when it comes to epistemic luck, because (on most views at least) belief is a component of knowledge, and it is certainly common to regard the formation of at least one's most basic perceptual beliefs as not being within one's immediate control. Nevertheless, it seems to odd to argue on this basis that basic perceptual belief is 'lucky'.

So although there is clearly something intuitive about thinking of luck in terms of accidentality, chance, or the absence of control, there is no straightforward way available of accounting for luck in these terms. Unfortunately, the philosophical literature does not go further to offer any deeper analysis of the concept of luck that goes beyond these suggestive equivalences. There is thus a lacuna in the philosophical treatments of issues that turn on the notion of luck and this in itself suffices to cast doubt on the conclusions drawn from such debates. We will offer an account of luck below which incorporates the intuitions that drive the partial analyses offered in terms of accidentality, chance and the absence of control whilst lacking the problems facing these partial analyses. First, however, we will survey the studies regarding luck that have been undertaken in the psychological literature.

2. Psychological treatments of luck

Most of the work on luck in the recent psychological literature has taken place in terms of what is known as 'attribution research', which is concerned with the way in which people construct causal explanations for why events happened, such as people's actions (e.g., why a person did what they did) or achievements (e.g., why a person succeeded or failed).[8] Within this area of research, psychologists have examined when it is that people typically attribute an event as being due to luck and

[8] For reviews of this large body of research, see Fiske and Taylor (1991) and Hewstone (1989).

the feelings associated with such an attribution. Much of the work in attribution research can be traced back to the theoretical account of social perception provided by Heider (1958). Notably, Heider proposed that people tend to explain actions or events in terms of stable or enduring causes, rather than in terms of transitory or variable causes. Moreover, he made a distinction between internal (or personal) and external (or environmental) attributions. According to Heider, luck should be seen as a variable, external cause of an event:

> […] a person is felt to succeed because he is lucky when the resultant environmental force in the direction of the goal is at a maximum, or when the force away from it is at a minimum. Thus, when the success is attributed to luck […], two things are implied: First, that environmental conditions, rather than the person, are primarily responsible for the outcome, and second, that these environmental conditions are the product of chance […] (Heider, 1958, p. 91)

Thus, according to Heider, a success for which the individual has little or no responsibility but which is, instead, due more to chance factors is likely to be attributed to luck. Accordingly, Heider suggested that there is a relationship between attributions to luck and what the attributor knows about the personal (internal) characteristics of the person whose performance is to be explained. If personal factors such as ability or effort are perceived as being low, then success may be more likely to be attributed to environmental factors such as luck. This follows from the 'hydraulic' relationship he proposed between internal and external causes which suggests that the less an internal cause is perceived to be responsible the greater an external cause is perceived to be responsible (and vice versa). A number of empirical studies have tested aspects of Heider's theory and found in its favour. As a result of this initial experimental support, Weiner and his colleagues elaborated upon some of Heider's ideas with particular reference to attribution for success and failure in an achievement context (e.g., Weiner et al., 1972; Weiner, 1986). Within the more developed framework that Weiner offers, an attribution to luck as the cause of an event would be typically classified as an attribution to an external, unstable and uncontrollable cause.

Of course, the problems that afflict the philosophical treatments of luck also have application here, since the model of luck that Heider proposes deals in the same kind of conceptual mapping of luck in terms of the concepts of a lack of control of events on the part of the agent and the concept of chance events. In particular, an explanation is needed of why not all chance events that are out of an agent's control are regarded as being due to luck (cf., the 'landslide' objection offered above), and also of what chance consists in (i.e., improbability, indeterminacy or something else). Nevertheless, by offering an account of luck in terms of lack of control and chance, Heider does evade one of the objections offered above—viz., the 'rising sun' objection—since, intuitively, it is not a matter of chance that the sun rose this morning (even though it is out of one's control).

Where the psychological treatment of luck most clearly diverges from the philosophical treatment, however, is in the greater sensitivity that it displays to the

possibility that our intuitions about luck might not translate into concrete (and consistent) formulations of the concept of luck. As Cohen notes:

> The idea of luck is ubiquitous but by no means simple, in the sense that it means precisely the same to everyone, everywhere. Expressions for 'luck' in different languages introduce nuances that are difficult, if not impossible, to capture in any particular tongue. And even those who speak the same language do not necessarily use the word for 'luck' in the same sense. (Cohen, 1960, p. 114)

Indeed, this possibility that the concept of luck may be more ambiguous than it at first seems has itself been looked into. In particular, the issue of whether or not subjects share with researchers a conception of luck as something that is external to the individual, unstable over time, and is completely uncontrollable has been explored. For example, studies conducted by Meyer (1980) and Meyer and Koelbl (1982) found that, respectively, luck was not clearly identified by subjects as being either external or internal and that luck was not clearly identified by subjects as being uncontrollable. In short, there is experimental support for the contention that the theoretical classification of luck does not appear to be universally agreed upon by lay persons.[9]

One possible reason for the lack of agreement between the quotidian and the theoretical classifications of luck may be a confounding of 'luck' with 'chance', two notions which, as noted above, are not conceptually tied in the direct manner that many suppose. For example, Fischhoff (1976) has commented that:

> Some attribution researchers, particularly those concerned with perceived causes of success and failure, have elicited attributions to the category of "luck". Presumably, any chance factors impinging upon a success–failure outcome do constitute either good or bad luck—depending upon how things turn out. Yet it is not clear […] whether chance and luck are indeed synonymous even in success–failure situations. It appears, for example, that "luck" is a person attribution, whereas "chance" is a property of the environment. (Fischhoff, 1976, p. 434)

Fischhoff is not alone in expressing this concern. Others have also noted this apparent confusion between luck and chance:

> Although the term luck is most frequently used in the causal-attribution literature, chance may well be a less confusing term, particularly with respect to the stability dimension. Chance is clearly random and unstable. However, when one speaks of luck, one can think of either the randomness of the concept or the trait aspect, which is indicated in the phrase "he is a lucky person". (Chandler & Spies, 1984, p. 1119)

[9] See also the studies by Rotter and Mulry (1965) and Karabenick and Addy (1979). It is interesting to note that Weiner (1986) explicitly recognised that his model of causal structure was limited in that it was derived by attribution theorists rather than from research participants (though see Russell, 1982, for empirical support for this model).

As we saw earlier, however, it is not easy to identify the conception of chance that is in play here which afflicts only environmental factors. Except as regards events that are genuinely due to indeterminate factors (if such events exist), it is not obvious that *any* event is the product of chance.

In any case, some research has begun to identify differences between subjects' conceptions of luck and chance. For example, in gambling situations, attributions to luck often arise when there appears to be regularity, as opposed to variability, in the pattern of outcomes (Keren & Wagenaar, 1985; Wagenaar, 1988). Keren and Wagenaar (1985) report that, at least in gambling situations, people do perceive chance and luck as real but different causes of events. They asked blackjack players to identify the relative importance of chance and skill in the game of blackjack by dividing 100% into two parts. However, the participants in the study generally believed that there were, in fact, *three* important factors; the third being luck. When they were asked to divide 100% into the three factors, luck was perceived as being most important (45%) with skill being viewed as less important (37%) and chance as least important (18%). Keren and Wagenaar also found that 22 of the 28 blackjack players interviewed distinguished between chance and luck. There was consensus among those interviewed that luck was a concept that refers to a person, whilst chance refers to an event or outcome—some people may be luckier than others, whereas chance is the same for everyone. Thus their views reflect the speculations made by both Fischhoff (1976) and Chandler and Spies (1984).[10]

The ambiguity that emerges here is between luck as it applies to events and luck as it applies to persons. The particular conception of the distinction between luck and chance in these studies depends upon distinguishing between features of the event and features of the person (where chance is a feature of the event and luck is a

[10] Other research has demonstrated that people typically discriminate between luck and chance in their daily lives. Wagenaar and Keren (1988) asked 200 students to write a short description of an event that had happened to them in their own lives. Half of them were instructed to describe an event that was a good example of something that happened by chance, while the remaining participants were instructed to write of a lucky event. This procedure resulted in 80 stories that were appropriate to be used in the experiment (40 'luck' stories and 40 'chance' stories). When 200 students from a different University were asked to rate the degree to which 12 different dimensions were applicable to each of the stories, it was found that luck and chance stories differed along several of the dimensions with which the participants were presented. They reported that luck stories tended to be associated with escape from negative consequences, important consequences, level of accomplishment and prolonged consequences. Chance stories were associated with coincidence, surprise, fun and social contact. Two dimensions were not indicative of either chance or luck: emotions and probability. In a second experiment Wagenaar and Keren (1988) explored further the dimensions upon which perceptions of luck and chance seemed to differ the most: surprise and consequence. They hypothesised that varying the surprise of an outcome should affect perceptions of chance, while varying the consequence of an outcome should affect perceptions of luck. Their hypothesis was only partly confirmed in that variations in the consequence affected the perceptions of luck more than perceptions of chance (as predicted) whereas variations in surprise affected both the amount of perceived chance and luck. Thus, it appears that the higher the consequence of an outcome of an event the more likely one perceives luck to be involved rather than chance. As Wagenaar and Keren (1988) suggest, "large benefits come, not by chance, but through luck" (73). This adds credence to the suggestion made above that there is a 'subjective' component of luck that needs to be incorporated into any account of the notion. We discuss this further in Section 3.

feature of the person). In contrast, if one retains the conception of luck as applying to events, then there is not the conceptual space to mark the distinction in this way. The characterisation of luck offered in Section 3 responds to this ambiguity.[11]

A more sophisticated approach to studying people's perceptions of events as lucky or unlucky in the recent psychological literature focuses on the role of comparison processes. Such an approach is less problematic than traditional attribution research as it does not make the assumptions about how luck should be classified within an underlying causal framework. However, it is similar to some of the work of attribution theorists in that it aims to identify the characteristics of events that are described as lucky (cf., the early attribution research that identified the conditions associated with attributions to luck).

Indeed, in his later writings, Heider, the pioneer of attribution theory, has recognised that an outcome might be perceived as lucky by comparison:

> Something can be bad in itself […] but because one got it instead of something still worse, it is luck. I am lucky not to be killed in an accident, and to get away with just a broken arm. (Heider, 1988, p. 350)

Added to this, Janoff-Bulman (1992) noted that victims of trauma and survivors of extreme negative events, such as rape, often react to such events by perceiving themselves as having been lucky because they imagine how their situation could have been worse. This kind of comparison between what has actually happened and what might have happened, but did not, has been termed 'counterfactual thinking' and appears to play a role in a number of areas of social perception (see, for example, Miller, Turnbull, & McFarland, 1990). A number of studies have empirically examined the role of counterfactual thinking in the attribution of an event to luck. In one study, Johnson (1986) had participants read descriptions of a day in the life of a college student that ended with either a major positive outcome, a major negative outcome, a major positive outcome that almost occurred but did not, or a major negative outcome that almost occurred. In a control condition, no such major outcome was described as occurring or nearly occurring. Participants were asked to imagine themselves in the situation and to rate how lucky, happy and satisfied they would feel. 'Near losers' (i.e., those who nearly experienced a major negative event) were rated as more lucky, but not necessarily more happy and satisfied, than those in the control condition, whilst 'near winners' (i.e., those who nearly experienced a major positive event) were regarded as less lucky than those in the control condition. These findings suggest that the thought of what might have happened is an important factor in attributing an event to luck (or at least describing an event as

[11] It is notable that, in his later formulations of attributional theory, Weiner (1986) recognised the ambiguity concerning the term luck. He acknowledged that luck could be seen as an enduring personal characteristic of some people and so may be perceived as internal, somewhat stable and, to some extent, controllable, whilst chance was more typically perceived as external, unstable and uncontrollable. However, a search through the last 10 years of Psychological Abstracts on CD-ROM shows that attribution research has continued to elicit attributions to luck which are then classified in the traditional manner. Similarly, various refinements of locus of control measures continue to include items that treat luck as external (see Lefcourt, 1991).

lucky or unlucky). Note, however, that in this context the perception of luck is treated more as a subjective feeling rather than as a causal attribution. Nevertheless, the comparison to a counterfactual outcome appears to affect feelings of subjective luck and so, by association, luck may be perceived as a cause of the event (in that it was luck that prevented the counterfactual outcome from happening).

Some recent work has further examined the role of counterfactual thinking in perceiving an event as lucky or unlucky. Teigen (1995) presented students with descriptions of lucky and unlucky events based on descriptions of incidents which had been provided by participants in a previous study. All explicit references to luck were removed. The students were asked to rate how attractive they considered each event, the degree to which they had the impression that something else could easily have happened, and how attractive this alternative would have been. Unlucky events were generally rated as unattractive and as less attractive than lucky events, although lucky events were not rated as especially attractive in themselves. What seemed to be more important was that, for both types of event, raters had the impression that something else might have happened. That is, they were able to imagine counterfactual events that almost happened. Moreover, counterfactual comparisons associated with lucky events were regarded as less attractive than what actually happened, whilst for unlucky events these counterfactuals were more attractive than the actual event. In a parallel study, in which students rated descriptions of positive and negative experiences, as opposed to lucky and unlucky experiences, counterfactual comparisons were not so easily imagined. This suggests that counterfactual thinking plays a role that is particular to perceiving an event as lucky or unlucky that does not apply to positive or negative events as a whole.

Employing a similar design to that of the above studies, Teigen (1998a) found that hazardous situations (where less attractive counterfactuals are easily imaginable) were more likely to be perceived as lucky than unlucky. In a series of studies, Teigen (1996) has further examined how manipulating factors that have been shown to influence counterfactual thinking affects how lucky or unlucky an event is perceived. For example, Kahneman and Varey (1990) have noted how counterfactual thinking is more likely if an alternative situation or outcome is perceived as being close, whether in space (e.g., a few millimetres away) or in time (a few seconds away). Teigen found that when a success was perceived as being physically close to a failure (i.e., when a wheel of fortune stopped in a winning sector, but was physically close to stopping in a losing sector) the success was perceived as more lucky than when the failure was not perceived as physically close.

Moreover, Teigen (2003) also found that this counterfactual closeness could not be understood simply in terms of the probabilities involved. Subjects were willing to treat events as being different as regards the degree of luck involved even whilst granting that the probabilities of each of the two events occurring was the same. Subjects would, for example, recognise that the probability of one's ball landing in a losing sector on a roulette wheel was constant wherever the ball landed in that losing sector, whilst also regarding an event in which one's ball landed near-to the winning sector as involving bad luck, unlike other events where the ball landed further away

(which, depending on where the ball landed, were either not regarded as unlucky at all, or else regarded as involving less bad luck).[12]

Surprisingly, it has also been noted that people often attribute more permanent aspects of their lives to good luck or good fortune (e.g., Teigen, 1996, 1997). This can be observed in comments such as "I am lucky to have a wonderful family", "I am lucky to have had an education" or "I am lucky to have a job I enjoy". It has thus been suggested that subjects employ similar comparison processes to those just described when attributing luck to such long-term or global situations as well as for outcomes of isolated events, even though such attributions do not (at least intuitively) concern 'successful' events that are counterfactually close to the relevant failure (i.e., not having a wonderful family, job, etc.).[13] This counterfactual element of the everyday conception of luck, in both of the forms just noted, is further discussed in terms of the account of luck offered in Section 3.

A final, and rather distinct, approach to the study of the psychology of luck has been to examine people's beliefs about luck. For example, Hayano (1978) found that poker players perceived luck to be some kind of 'agent' that explained why cards would fall in detectable patterns. Players believed they could control their luck by employing a variety of strategies such as talking to the cards, moving seats or playing at a different table. More recently, Darke and Freedman (1997a) have provided evidence to suggest that reliable individual differences exist with respect to beliefs about luck. They proposed that, whilst some people hold a 'rational' view of luck as random and unreliable, others hold an 'irrational' belief about luck as being a "somewhat stable force that tends to influence events in their own favour" (p. 486). To test this hypothesis, Darke and Freedman developed a Belief in Good Luck Scale. This scale consists of 12 items (such as "I consistently have good luck" and "There is such a thing as luck that favours some people, but not others") to which respondents rate their level of agreement. Thus, higher scores on this scale reflect a stronger belief that luck is a personal and stable influence in their daily lives. Not only did Darke and Freedman find reliable individual differences in scores on their scale, they also found evidence to suggest that belief in luck as a stable and favourable influence was distinct from related constructs such as locus of control, optimism and self-esteem. In addition, such a belief appeared to be distinct from what Darke and Freedman describe as a belief in personal good fortune:

[12] There is also a burgeoning psychological literature on the role of counterfactual thinking in our everyday reasoning which mirrors this counterfactual dimension to luck ascriptions. See, for example, Teigen (1998b), Tetlock (1998) and Tetlock and Lebow (2001). We are grateful to the authors of these articles for bringing them to our attention.

[13] Teigen (1997) examined this possibility by asking participants to briefly state what they felt was implied by statements such as "I am lucky to have a family" compared with "It is good I have a family". It was found that 'lucky' statements were far more likely to be viewed as implying a comparison to others than were 'good' statements (for example, 70% of participants believed "I am lucky to have a family" implied such a comparison, whilst no participants believed "It is good I have a family" implied this). Thus, it would appear that an attribution to luck in this context again implies an awareness of an alternative state of affairs where one is making a downward comparison with those people who do not have a family (i.e., people who are less fortunate), and so one's circumstances should not be taken for granted.

> Many people will say that life has been good to them—they have better-than-average families, health, economic situations, personal characteristics, talents, and so on. This is sometimes called being fortunate or having good fortune, but is also often called being lucky. (Darke & Freedman, 1997a, p. 499)[14]

What is significant about the person-based conception of luck that emerges from these studies is that it may reflect a belief on the part of the subject that the agent in question (usually the subject himself) has some sort of hidden 'skill' to manipulate events (or at least, 'chance' events).[15] This kind of conception of luck is clearly related to Langer's (1975) theory about an 'illusion of control'. As noted above, Hayano (1978) observed how poker players sometimes behave as if they can control the outcome of chance events. Henslin (1967) observed similar behaviour among crap-shooters who would talk to the dice before throwing for a desired number, throwing them softly for a low number and hard for a high number. Henslin interpreted these behaviours in terms of players' belief in magic. However, Langer suggested that these kinds of behaviours might be better understood within the context of an illusion of control which can be defined as "the perception of control over objectively chance-determined events" (Langer & Roth, 1975, p. 951). She proposed that an illusion of control arises because people have a tendency to assume a skill orientation in chance situations, and so perceive such situations to be controllable. Langer demonstrated that we are particularly susceptible to this illusion when factors from skill situations (such as competition, choice, familiarity and involvement) are introduced into chance situations. For example, in one of Langer's studies, she found that lottery participants who were allowed to choose their own ticket were more reluctant to re-sell their ticket than participants who were simply assigned a ticket. It was as if the act of choosing their own ticket led them to be more confident that the ticket would win than if the ticket had been randomly assigned to them. According to Langer, participants were not treating the lottery as a chance event but rather one that is influenced by skill, even though they had no control over the outcome. Other studies have found that when people experienced an initial

[14] Darke and Freedman (1997a) measured belief in personal good fortune by asking each of their participants to rate their family's financial situation (compared to other families), their overall health and that of their immediate family, the perceived security of their job, and whether they felt they were really getting the things they desired most out of life. Each of these ratings was made on a separate seven-point scale. Participants were also asked to indicate whether they had experienced any of the following different life events or circumstances: a serious accident involving personal injury, or injury of a close family member; a serious illness, or the illness of a close family member; a serious medical operation for themselves or a close family member; and whether they were married, had children, or owned a home. An overall incidence measure was calculated for these nine events/circumstances by summing the number of positive responses (positive responses consisted of not having had a serious accident, or serious illness, etc., being married, having children and owning a home). Darke & Freedman found no significant correlations between scores on the Belief in Good Luck Scale and any of these measures of personal good fortune, leading them to conclude that belief in luck as a stable and favourable influence was unrelated to whether people simply believed they had been fortunate in the past. Belief in good luck was also found to be largely independent of a general satisfaction with one's life.

[15] Though not necessarily. It could be that the agents are simply confusing the concept 'luck' with that of 'fortune'. We discuss this distinction further in Section 3.

success on an ostensibly randomly determined task they were more likely to treat the task as controllable (e.g., Langer & Roth, 1975; Gilovich & Douglas, 1986). Some researchers have argued that these findings are best explained in terms of people's beliefs that luck can influence the outcome of events (e.g., Darke & Freedman, 1997b).

Perhaps unsurprising, this feature of the psychological debate regarding luck has been of interest to researchers in parapsychology. After all, if one construes parapsychology as "the scientific field that is concerned with interactions, both sensory and motor, that seem not to be mediated by any recognised physical mechanism or agency" (Rush, 1986, p. 4), then a clear case emerges for examining these 'lucky' skills to see whether (i) they exist and (ii) appropriate parapsychological explanations can be given of them. A number of researchers have speculated about possible parapsychological explanations for people's experiences of luck, and some have conducted experiments to assess these explanations (for a review, see Smith et al., in press). Although the findings from these studies do not unequivocally support a link between luck and 'psi' (the term used to refer to ostensibly parapsychological abilities), such a link would lend support to the beliefs about luck discussed above (i.e., that luck is controllable).

In general, we can draw three main conclusions from this survey of the psychological literature on luck. First, that it is far more sensitive to the manner in which our everyday intuitions about luck may license contradictory elucidations of this notion. Second, that one particular way in which our everyday intuitions about luck are contradictory is in terms of how they appear to license both the interpretation that luck is a feature of events that are (for the most part) external, unstable and uncontrollable, and the interpretation that luck is a property of persons which enables them to have a certain kind of 'hidden' influence over events (though perhaps only chance events). This second observation in turn raises the sub-issue of whether it makes sense to understand the luck that attaches itself to persons rather than to events as being skill-based (as some parapsychologists have suggested), or whether it merely represents an 'illusion of control' on the part of the subjects concerned. And finally, third, that there appears to be a role for counterfactuals to play in any plausible account of luck. This final issue in turn raises the sub-issue of whether an understanding of luck in terms of counterfactuals can capture the 'subjective' aspect of this notion (i.e., that it is only events which are significant in some way to the agent concerned that can count as lucky or unlucky). Moreover, the role of counterfactuals here poses a challenge to the simple-minded view about types of luck that is found in the philosophical literature. There it was simply taken as given that only events which the agent regarded as positive could be candidates for 'good luck' ascriptions, and only events which the agent regard as negative could be candidates for 'bad luck' ascriptions.[16] As we have seen, however, the situation is in fact more complicated, in that, for example, even a 'bad' event, such as a car

[16] Recall the passage from Statman (1991, p. 46) that we quoted in Section 1: "Good luck occurs when something good happens to an agent P, its occurrence being beyond P's control. Similarly, bad luck occurs when something bad happens to an agent P, its occurrence being beyond his control."

accident, can be regarded as an instance of good luck if the counterfactual comparison is an event which is even worse (such a car accident that kills the agent).

3. An elucidation of the concept of luck

Fortunately, there is a way of thinking about luck that can accommodate the range of intuitions canvassed so far whilst also reconciling this apparent contradiction in our everyday conception of luck. In order to outline what this conception of luck is, however, it is first necessary to say a little about the philosophical notion of 'possible worlds'.

Call the world that we in fact inhabit the *actual world*. This world is contrasted with an unlimited number of *possible worlds*, worlds which are different, in some respect, to the actual world. More specifically, the actual world is the complete description of what is actually the case, whilst each possible world is a complete counterfactual description of what could have been the case.[17] Possible worlds are here to be understood in the standard way as ordered in terms of a similarity function with respect to the actual world. That is, a possible world counts as nearer to the actual world than another possible world provided that the former possible world is more similar to the actual world than the latter possible world. The most common explication of this similarity function, and the one that we will employ here, is in terms of what needs to be different to effect the change from the actual world to the target possible world. For example, the possible world in which all that is different from the actual world is that one particular table is two inches to the left is in the relevant sense 'closer' to the actual world than a possible world in which every table is two inches to the left since more needs to be different to turn the actual world into the latter possible world than is the case with the former possible world. This conception of the orderings of possible worlds will be important to what follows.[18]

With this account of possible worlds in mind, consider the following characterisation of what, we argue, is one of two conditions which, collectively, capture the 'core' notion of luck:

> (L1) If an outcome is lucky then it is an outcome which occurs in the actual world but which does not occur in most of the nearest possible worlds to the actual world (worlds which most resemble the actual world).

[17] Accordingly, a proposition which is false as a matter of logical necessity (e.g., 'P ≡ not: P') will be false in all possible worlds (i.e., will not be part of the complete description of every possible world), whilst a proposition which is true as a matter of logical necessity (e.g., 'P ≡ P') will be true in all possible worlds (i.e., will be part of the complete description of every possible world). In contrast, contingent propositions (such as, 'Napoleon was exiled to Elba') will be true in some possible worlds and false in others (i.e., they will be part of the complete description of some possible worlds and not part of the complete description of others).

[18] For the key texts on possible worlds, see Lewis (1973, 1987) and the papers collected in the volume edited by Loux (1979).

With L1 in mind, consider how it captures two of the paradigm cases of luck mentioned in Section 1, the lottery win and the lucky discovery of treasure. Take the lottery case first. Here we have a lucky outcome which, true to L1, occurs in the actual world but which—(so long as, of course, the lottery was both fair and sufficiently demanding)—does not occur in most of the near-by possible worlds. After all, the whole attraction of a fair lottery is that the possible world in which one wins is very alike the actual world, even though it is in fact unlikely that such a possible world should be the actual world.[19] This point highlights the sense in which the similarity ordering of possible worlds is not tantamount to an ordering in terms of probability. For although it is highly unlikely that one should win the lottery, it is still nevertheless true that there is a near-by possible world in which one does win the lottery because very little needs to be different to turn the actual (non-lottery-winning) world into the appropriate (lottery-winning) possible world (a few numbered balls just need to fall into slightly different holes on the machine that draws the lottery numbers). L1 thus explains our first paradigm case of luck, in that the lucky event of a lottery win is clearly an event which, on this conception of possible worlds, obtains in the actual world but not in most near-by possible worlds.

Similarly, L1 can also account for the case of the lucky discovery. According to L1, this event can count as lucky because, although it occurred in the actual world, it does not occur in most of the possible worlds that are most alike the actual world. And, indeed, this conforms to our intuitions concerning this case. After all, to say that the discovery is lucky is to say that, in most possible worlds similar to the actual one, one would not have made the discovery that one did. Accordingly, it follows that although the treasure was found in the actual world, it would not have been found in most near-by possible worlds, just as L1 demands.

Significantly, this condition on luck can also accommodate examples which are not, intuitively, cases of luck. For example, it is not lucky that the sun rose this morning, on this view, because although this is an event that is out of one's control, it is nonetheless also true that the sun rises in most (if not all) of the nearest possible worlds to the actual world.

A further motivation for employing this type of condition on luck is that it can explain why accidentality and lack of control are both closely related to, but not essential to, luck. After all, if I have control over a certain event, such that I am able to (typically) determine that a certain outcome occurs, then that is most naturally understood as saying that in most near-by possible worlds that outcome is realised and therefore not lucky (just as L1 would predict). Consider the example of a fair 100 m race between an amateur athlete and an Olympic gold medallist at this distance, both of whom want to win. Presumably, we would say that if the gold medallist wins then that win is not due to luck, whilst if the amateur athlete wins then (all other things being equal) it is (because it will be due, for example, to the gold

[19] Indeed, in the UK the national lottery explicitly plays on this intuition in its advertising campaign which shows people in everyday situations discovering that they have won the lottery, along with the accompanying slogan "It could be you".

medallist falling over or succumbing to some similar fate). Moreover, this is reflected in the fact that it is only the Olympic gold medallist who has significant control over the outcome in this respect. After all, because of his prodigious skill, coupled his strict training schedules and heightened levels of concentration, he is able to not only ensure that he wins in the actual world, but also in nearly all of the near-by possible worlds as well. Indeed, the only worlds where he fails to win are those where something goes wrong, such as those worlds where he stumbles and falls before the winning line. Accordingly, should the other runner win the race, then this win will be lucky because in most of the nearest possible worlds he loses. Control over events is thus a good determinant of whether or not luck is involved.

Similar remarks apply to accidentality. To say that an outcome is an accident is, intuitively, to say that in most near-by possible worlds it does not occur. Accordingly, on the rough modal analysis offered of luck above, it would follow that accidental outcomes will tend to be lucky outcomes. For example, to say that I found the buried treasure by 'accident' is naturally taken to mean both that in most near-by possible worlds I do not find the treasure and also that my discovery is due to luck.

L1 is also able to capture the relevant sense of 'chance' that we saw commentators trying to identify above. The chief concern raised regarding accounts of luck formulated in terms of chance was that it was unclear how one is to understand the notion of chance in this context. In particular, it was noted that the two most plausible ways of understanding this notion—in terms of low probabilities or indeterminacy—were highly unsatisfactory since there were paradigm cases of luck where the event in question was, at least in one sense, neither indeterminate nor of a low probability. By employing L1 we can evade this concern by noting that the sense of chance in play is merely that modal notion of how the event in question, though it occurs, does not occur in most worlds similar to the actual one. On this view, the temptation to identify chance with indeterminacy, low probabilities or some other factor is simply a red herring.

One further advantage to L1 is that it can incorporate our intuition that some events are luckier than others. After all, sometimes events occur which are so fortuitous that they appear to constitute a greater degree of luck than is usual. For example, that I happen find my wallet, replete with its contents, in the street the day after losing it is clearly lucky, but it is not nearly so lucky as losing my wallet and then finding it again, replete with its contents unharmed, a year later. A plausible explanation of why we think the second outcome is luckier than the first is that there are far fewer near-by possible worlds where the second event occurs than the first event occurs. L1 thus captures the sense in which extremely unusual events can be regarded as luckier than just plain unusual events.

This element of L1 also points to another aspect of luck—its inherent vagueness. After all, there will be events where it is just hard to say whether or not they are lucky. For example, does dropping one's wallet and finding it (untampered with) 10 min later when one retraces one's steps (and knowing that one has only just dropped it) count as lucky? Possibly, though, equally, possibly not. Our confusion here relates to the fact that such an event is part of the wide range of penumbral

cases where it is just not clear whether luck is involved.[20] L1 captures this aspect of luck because it will likewise be a vague matter whether or not the event does not occur in most of the near-by possible worlds. In general, possible worlds are not well-suited to drawing sharp boundaries because it is not always clear how to accurately 'measure' the nearness of the relevant possible world, nor to 'count' possible worlds in the required manner.[21] Nevertheless, although this is, in general, a drawback to the use of modal language, it is not nearly so problematic when the modal language is employed in a case like this because the vagueness inherent in the modal language simply reflects the vagueness inherent in the concept that we are trying to capture.

L1 alone does not capture the core notion of luck, however, because, as we noted above, we also need to say something about the significance that the agent in question attaches to the target event, since it is only significant events that are counted as lucky or unlucky. The example cited in Section 1 to illustrate this was that of the landslide which did not affect anyone, either positively or adversely. Clearly, such an event is neither lucky nor unlucky. Nevertheless, it might still be an outcome that meets the condition outlined in L1, and hence this example serves to illustrate that L1 alone will not suffice to capture the core notion of luck.

We thus need a second condition that captures the 'significance' element of luck. Here is one possible formulation:

(L2) If an outcome is lucky, then it is an outcome that is significant to the agent concerned.

Though vague, this condition should suffice to capture the basic contours of the 'subjective' element of luck, and thus also capture the sense in which luck can be either good or bad. Take the landslide example just noted, for instance. L2 rules this event out as being an example of luck on the grounds that it is not an event that is of any significance to anyone. Moreover, by adapting this scenario, we can capture the sense in which whether or not an event is judged to be lucky can depend upon the agent concerned. After all, if only one person was affected in a significant way by the

[20] Indeed, whether or not, ultimately, we regard luck as being involved in these cases might depend upon the significance that we accord to the event in question, as discussed below.

[21] This is the so-called 'world order' problem for possible worlds. A related difficulty is that of the 'world border' problem, which concerns how one is to identify the nearest possible world to the actual world. For discussion of these two issues, see Lewis (1973, 1987). A further problem in this regard is just how one is to understand the possible worlds in question. For example, when dealing with the lottery case we intuitively understand the relevant class of near-by possible worlds to be those where, if one does not actually buy a lottery ticket, one at least make some effort to purchase one. If we did not understand the near-by possible worlds in this way then worlds in which one makes no attempt to buy a lottery ticket could count as modally close and thus, in principle at least, influence whether the lottery win was lucky or not. Since context normally takes us to the range of worlds at issue directly, we will not try to modify L1 to handle this issue here except to note that the modification in question would have to explicitly demand that each of the near-by possible worlds that are relevant should have certain features in common with the actual world. (This debate is analogous to that in epistemology concerning the need for any account of knowledge formulated in terms of possible worlds to explicitly index the agent's belief to the method or process employed to form that belief in the actual world. In this way, only those possible worlds where the agent forms his belief via the same process or method as in the actual world are able to influence the agent's possession of knowledge. For the key discussion in this respect, see Nozick, 1981, pp. 179–185.)

landslide, then this event would be lucky (or unlucky) for them only. Furthermore, the manner in which the luck affects the agent will determine the type of luck that is involved. For example, if the landslide has adverse effects on the agent (as one would expect)—such as if it destroyed his house—then we would expect this agent to regard this event as being bad luck. Conversely, however, if the landslide has positive effects—if, for example, it levelled the hillside that he was about to pay a small fortune to have levelled artificially—then we would expect the agent to regard this event as good luck. The type of luck, and its very existence from that agent's point of view, thus depends upon the significance that the agent attaches to the event in question.[22]

Although there is a presumption in favour of a lucky event being considered a case of bad luck if the event is regarded by the agent negatively (or considered a case of good luck if the event is regarded by the agent positively), in line with the empirical data cited in Section 2 this presumption can be overridden if the conversational context explicitly focuses on a specific counterfactual comparison. That is, a car accident which the agent survives—an event in which luck is involved and which is regarded by the agent in a negative fashion—will tend to be regarded as an instance of bad luck, but this type of luck ascription can be altered if the conversational context encourages the agent to focus on a counterfactual alternative that is even worse, such as a car accident in which the agent dies. Similar remarks will apply to ascriptions of good luck.[23] So whilst the presence of luck will depend upon conditions L1 and L2 obtaining, and whilst the type of luck involved—good or bad—will tend to covary in line with whether or not the event is (respectively) regarded negatively or positively, this account can allow for those cases in which 'negative' events are viewed positively (and vice versa), because of the specific counterfactual comparison that is at issue in that conversational context.

A further advantage of employing L2 as a condition on luck is that it can account for a second sense in which luck comes in degrees which is different from that accommodated by L1. In the case of L1, we capture degrees of luck in terms of how many near-by worlds the event in question obtains. A second sense in which luck admits of degrees, however, concerns the significance involved. Consider the following two scenarios. First, that one suffers the misfortune of having one's home swept away in a hurricane, but where none of one's family was in the home at the time. Second, where one has the misfortune of not only having one's home swept away in a hurricane, but also of losing one's family as well since they were in the house at the time. Intuitively, the second scenario is a case of bad luck that outweighs that in play in the first scenario. Now one could, of course, understand the difference of degree here in terms of how the second case might be more unusual than the first (perhaps this is a holiday home and one's family are hardly ever there),

[22] Indeed, the very same event can be judged to be lucky by one person, unlucky by another and neither lucky nor unlucky by a third person (see, for instance, the example of the sinking of the Spanish Armada offered by Rescher, 1995, p. 20).

[23] In a recent article, Teigen (2003) outlines in detail how the focus of the conversational context can alter the type of luck ascription that the agent makes. We are grateful to Teigen for drawing our attention to this article.

and therefore regard the second scenario as obtaining in fewer of the near-by possible worlds than the first scenario. But there is no inherent reason why we should understand the difference of degree in this way. Instead, the intuition in such a case is, I take it, that the difference relates to the significance attached to the event by the agent. Losing one's house and one's family is, ceteris paribus (one might hate one's family!), a far worse event than merely losing one's house. There are thus two axes along which degrees of luck run—that of how unusual the event is, and that of how significant the event is.[24]

Before we go on to consider the manner in which this notion of luck can be employed to handle the diverse empirical results found in the psychological literature, we need to remark on two points which threaten to complicate this otherwise neat picture of the core conception of luck. The first of these points concerns the sense in which one can be lucky even though one does not recognise this fact. After all, one might have narrowly avoided being hit by a thunderbolt, and thus losing one's life, and yet simply fail to notice that one had had such a lucky escape. The problem that such an example raises is that it seems to be a case of a lucky event even though the event is not significant for the agent concerned because he is unaware of it. Prima facie, then, it would appear to be a counterexample to any account of the core notion luck formulated in terms of the conjunction of L1 and L2.

The way to deal with such an example is to widen our understanding of significance so that it includes what the agent would find significant were they to be availed of all the relevant facts. In this way, L1 and L2 can once more accommodate an example of this sort.

The second challenge to this account of luck is posed by those, such as Rescher, who argue that luck is inextricably tied to what the agent can rationally expect to occur. On this view, an outcome could be lucky for an agent even though it occurred in most near-by possible worlds just so long as the agent himself could not be rationally expected to have predicted such an event. Fortunately, the examples that Rescher offers to support this line are unpersuasive. Here is one of them:

---

[24] For this reason, there will in principle be some cases where the highly unusual nature of the event will be 'cancelled out' by the low significance of the event. (Similarly, one could formulate a scenario in which the high significance is 'cancelled out' by the fact that the event is only marginally unusual). Moreover, as noted above, it could be that there are cases of luck that are penumbral by the lights of L1, but still cases of luck because they clearly fit L2 (where the event is highly significant). Again, this point will also work in reverse, where an event is penumbral by the lights of L2, but still a case of luck because it clearly fits L1. Note, however, that this does not mean that an event which does not meet L1 at all could still qualify as lucky because the event is highly significant. An example that illustrates this—due to Rescher (1995, p. 25)—is that of the Russian Roulette player who survives and is considered lucky even though the odds were in his favour (only one of the many chambers in his revolver was loaded). Rescher notes that although we might call such an example a case of luck because the outcome was highly significant and there was an element of chance involved, it is nevertheless more properly understood as a case of good fortune rather than luck (we remark on this distinction below). Our analysis conforms to this. If it is indeed the case that the agent survives in most near-by possible worlds, then it was not lucky that he survived no matter how significant or 'chancy' the outcome was. (Interestingly, Rescher (1995) also notes that there are two axes along which one can understand degrees of luck, although his account of the non-significance axis is very different from that outlined here. See, in particular, Section 3.4).

> […] a happy or unhappy development can be a matter of luck from the recipient's point of view even if its eventuation is the result of a deliberate contrivance by others. (Your secret benefactor's sending you that big check represents a stroke of good luck for *you* even if it is something that he has been planning for years). Thus even if someone else—different from the person affected—is able to predict that unexpected development, the eventuation at issue may still be lucky for those who are involved. (Rescher, 1995, p. 35)

It is far from clear that this is a case of luck, however, no matter how much the agent may regard it as such. Indeed, the example seems more accurately to be an instance of good fortune rather than luck on the agent's part, where fortune relates to those cases where the course of life has been good to one rather than cases where luck is specifically involved.[25] In order to see this, one need only note that if the agent were to discover that this event had been carefully planned all along, then he would plausibly no longer regard it as a lucky event. Indeed, once he discovered that this event was always due to occur, it seems plausible to suppose that he would regard himself as no more lucky than a favoured son is lucky to have received a vast inheritance from his rich father (i.e., not lucky at all, but merely fortunate). The moral to be drawn from such cases is thus not that lack of information on the part of the agent is a determinant of luck (which is the moral that Rescher draws), but rather that lack of information can seriously affect the agent's ability to correctly determine whether or not an event is lucky in the first place.[26] Accordingly, and this point will

[25] On this view of fortune, one could regard lucky events as being part of a more general class of fortunate events. Interestingly, Rescher (1995, passim) also makes this distinction between luck and fortune.

[26] Similar remarks apply to the other examples that Rescher (1995) offers to support his case in this regard. See, in particular, Rescher (1995, Section 2.5). In general, the failure of these examples to make their intended point undermines Rescher's account of luck by highlighting how it is unnecessary to contend that an event which is significant for the agent can be lucky in terms of both unpredictability that is due to chance and unpredictability that is due to ignorance on the part of the agent. The reason for this is that Rescher misunderstands the relationship between ignorance and luck. Consider, for instance, the main example that Rescher offers in support of his 'two-component' view, that of the luck involved in picking the right number on a roulette wheel in contrast to the luck involved in picking the right path to take when one confronts a fork in the road (see Rescher, 1995, pp. 35–36). In the former case, argues Rescher, the luck is a product of the unpredictability brought about by the chance nature of the situation. In contrast, in the latter case, the luck is the product of the unpredictability brought about by the ignorance on the part of the agent. Let us grant for the sake of argument that the latter case is indeed a case of luck (add some extra possible paths if that helps). Is it really true that we need to make explicit appeal to the agent's ignorance here to capture a special sense in which the outcome at issue in the second case is lucky? Seemingly not. After all, we can capture the luck at issue in the second case merely by noting (at least where there are more than two possible paths available) that in most near-by possible worlds the agent will choose the wrong path. Thus, we need make no explicit mention of the agent's ignorance. Of course, if there were some reason that the agent was unaware of why he was destined to pick the right path then this would present a prima facie difficulty, but then this difficulty would simply be handled in the same way as the 'benefactor' example discussed above by noting that, had the agent been aware of this fact, then he would not have regarded himself as lucky in the first place. Accordingly, once the examples are properly understood, one can subsume the motivation for Rescher's 'two-component' view under the more general modal account offered here. That is, ignorance on the part of the agent concerned can affect whether or not he correctly identifies that he is lucky, and (being a feature of the actual world) it can also

be significant to our discussion of how this account of luck impacts on the treatments of luck in the psychological literature, we must be wary of taking a subject's judgement about whether or not he is lucky at face value when that subject is in a state of information that is incomplete in some relevant way.

4. Employing the elucidation of luck

The import of the above discussion is that the conjunction of L1 and L2 offers us an account of luck that can meet most of the problems regarding the philosophical debate regarding luck. In particular, it can capture the paradigm cases of luck (and the paradigm cases where no luck is involved), whilst also accounting for the intuitions regarding luck that were noted above (that it has something to do with lack of control, accidentality, chance, and that it has a 'subjective' component). This initial success should suffice to motivate further philosophical work being conducted on how this account of luck can cast light on the specific philosophical debates regarding moral and epistemic luck.[27] A more pressing matter for our purposes, however, is how this account impacts on the debate regarding luck in the psychological literature. This is especially so given that the one 'intuition' that this characterisation of luck does not capture, at least directly, is the ambiguity between an event-based and a person-based conception of luck that is so central to the psychological literature.

Let us begin with those aspects of the psychological literature that this account of luck can directly accommodate. Clearly, the central advantage of this account is that it can straightforwardly capture that element of the psychological discussion that understands luck in terms of events. Consider again the approach favoured by Heider and Weiner that identifies luck with events that are determined 'externally' via chance environmental factors rather than 'internally' via actions undertaken by the agent. The characterisation of luck offered here accommodates this basic intuition since internally determined events are, intuitively, events which obtain not just in the actual world but also in most near-by possible worlds as well (as with the example of the Olympic runner above). Moreover, it is important that the external determinants of lucky events are due to chance because events that are not due to chance environmental conditions (such as the rising of the sun) are clearly not lucky. In terms of our modal language, a chance external determinant will be one that only effects the target outcome in the actual world and a handful of near-by possible worlds, and this is what makes such an outcome, if significant, lucky by the lights of

(*footnote continued*)
influence the range of possible worlds that are relevant to the determination of whether an event is lucky, but neither of these features of ignorance indicate that it needs to play an explicit role in our account of luck.

[27] For example, one consequence of this characterisation of luck is that the drunk driver in the example cited in Section 1 who manages to make it home safely is not (*contra* Nagel) thereby lucky (at least pending further details about the scenario), though he may well be fortunate. Initial work on how the account of luck offered here is applicable to the problem of epistemic luck can be found in Pritchard (2003, 2004).

L1. Furthermore, by outlining luck in terms of the more general modal notion of possible worlds rather than such concepts as chance, one evades the issue regarding just how environmental factors are to be understood as due to chance. That is, as noted above, the relevant sense of chance that is at issue here is best understood modally in terms of how such chance environmental factors only produce the target outcome in a small range of near-by possible worlds (as opposed to environmental factors that produce the target outcome in most of the near-by possible worlds). In this sense, the rising of the sun is not due to a chance environmental factor (and so is not lucky), whereas a lottery win is (and so can be lucky). Moreover, by not understanding the ordering of possible worlds in terms of the probabilities of the events involved, this modal account of luck avoids the problem raised by Teigen regarding how luck ascription do not covary with probability ascriptions.

Furthermore, by incorporating a 'significance' condition, L2, this account is also able to pay due attention to the sense in which there is a 'subjective' component to luck, a conclusion that is also found in the psychological literature. There are two features of the psychological literature that are being accommodated here. First, the significance condition captures the sense in which luck is distinct from chance, even when chance is understood along the lines formulated in L1. By the lights of this account, one reason why agents draw this distinction (we will discuss another below), is that chance is simply a function of the modal properties of the event itself, whilst luck also demands that the chance event in question should also be of significance to the agent. No wonder, then, that the psychological literature is full of studies which indicate that subjects make this distinction between chance and luck.

The second feature of the psychological literature that is accommodated, in part, by this element of our characterisation of luck concerns the 'counterfactual' element of how subjects typically understand the type of luck at issue. Whilst significant 'luck' events which are perceived by the agent negatively will tend to be regarded as instances of bad luck (and significant 'luck' events perceived by the agent positively will tend to be regarded as instances of good luck), the type of luck ascription can be altered by directing the agent to focus on specific counterfactual comparisons. Thus, a significant 'luck' event—such as a car accident—which is otherwise thought of as an instance of bad luck because it is generally perceived by the agent in a negative fashion, can be made into a good luck event by directing the agent to focus on a counterfactual comparison in which the event turned out even worse than it did (where the agent was killed, for example). Similar remarks will apply to 'luck' events which are generally regarded by the agent positively and which are thus ordinarily treated as instances of good luck.

The account of luck offered here can also capture the sense in which luck admits of degrees. This is particularly transparent when one considers those cases offered by Kahneman and Varey (1990) and Teigen (1996) discussed above where the degree of good luck ascribed by an agent depended on how counterfactually 'close' the possibility of failure was. Such cases clearly correspond to the reading of the modal account offered above where one event can be luckier than another because it obtains in fewer near-by possible worlds.

Not all of the examples offered in the psychological literature of how agents employ counterfactuals in their assessments of luck fit straightforwardly into this account, however. Consider, for instance, the examples offered by Teigen (1996, 1997) of agents who ascribe luck to relatively permanent aspects of their lives, such as when they observe that they are lucky to have a 'wonderful family'. Such cases do not conform to the account offered here because unless there is some specific reason for thinking that this outcome could not have occurred in most near-by possible worlds, then there is no reason for thinking that these cases meet L1 and thus should be treated as genuine instances of luck. The problem here is largely superficial, however, for it seems that the agents are simply confusing luck with fortune. If it is not at all 'chancy' that one has a wonderful family, then it is not a matter of luck that this outcome occurred. Nevertheless, one might consider oneself fortunate in that one's life has developed in this advantageous fashion rather than in some other way (just as one could be fortunate, but not thereby lucky, in being born with a happy temperament).

Nevertheless, the central difficulty that this account of luck needs to deal with concerns the key ambiguity noted in the psychological literature between luck as it applies to events and luck as it applies to persons. It is certainly the case that the psychological literature has identified a sense of the quotidian notion of luck that attaches to persons and so some account is needed to explain how this can accord with the conception of luck captured in L1 and L2. Our claim here is that the person-based notion of luck, whilst it derives its plausibility from the more basic events-based notion, is actually predicated on a conceptual confusion.

This claim, whilst controversial, is lent experimental support via a careful reading of the experiments regarding gamblers that were cited above. For what seems to be being ascribed to agents by the subjects in these studies is some degree of skill which enables the agents to manipulate outcomes, particularly (or perhaps only) where there is some significant degree of chance in play. Critically, however, an outcome that is brought about via an agent's skill is not, we argue, properly understood as a 'lucky' outcome. As noted above with the case of the runner of an Olympic pedigree, a genuine skill to achieve a certain end precludes, in the standard case at least, that the end is brought about by luck. Although there may be non-standard cases where the Olympic runner wins his race through luck (perhaps because every runner, including himself, falls over, but he happens to make it across the line first regardless), the usual case (the case that obtains in most near-by possible worlds) will be where the Olympic runner wins on grounds of skill. Accordingly, we would not say, in the standard case of the Olympic runner winning the race as a result of his skill, that the win was lucky. The task in hand is thus to explain why luck is being offered as an explanation in the case of the 'lucky' gambler.

It would seem that the putative 'luck' at issue in such cases is being ascribed because of the belief that the agent in question has some sort of inexplicable and hidden skill. That is, that the lucky gambler is someone who is able to influence chance events even though there is no clear explanation of how such a feat is being effected. Such cases force a dilemma. Either there is a genuine (though hitherto not understood) skill in play here, in which case the agent is not really lucky at all (just as

our account of luck would predict); or else there is no skill at work here (only the mistaken belief in one) and thus the results in question are indeed lucky, but the luck attaches to the event and not to the person (just as, again, our account of luck would predict). Either way there is no challenge to our characterisation of luck, but in each case there is an explanation of why the concept of luck is being predicated here at all. In the former case this is because the putative skill is mysterious and impacts on chance events, so giving the impression that the supposedly 'lucky' events are in fact the intended results brought about by a 'lucky' person. One can see how an inability to understand how certain results might be effected could lead to those results being attributed to a skills-based conception of luck (and thus a person-based conception of luck), especially when those results appear to be being generated in a fairly consistent way by the agent concerned. Once one identifies the process by which the results are effected, however, then the temptation to bring luck into the explanation subsides accordingly and, with it, any temptation to ascribe luck to the person as opposed to the event. Conversely, once it is identified that there is no genuine process effecting these results, then the luck remains but only at the level of the event with no corresponding temptation to ascribe it to the agent (since they have, ex hypothesi, no influence over the event).

In order to see this claim in more detail, consider how the issue of the possible existence of psi impacts on this debate. Were it to transpire that 'lucky' gamblers were in fact in the possession of parapsychological skills that were previously unknown, then it would clearly be the case that we would no longer attribute the success on the part of the agent to achieve certain results to luck (and, indeed, we would no longer think of the events effected by this means as being 'lucky' events). Similarly, were it to transpire that the apparent above-average performance of the 'lucky' gambler was illusory (and thus that the hypothesis of there being parapsychological skills in play was made redundant in this case), then again we would no longer ascribe luck to the agent. In this case, we would simply say that the event was lucky (in line with our account), and attribute no significance to the false beliefs of the agent that he is able to influence such lucky events. In such cases, we would simply say that the agent was labouring under an 'illusion of control', as discussed in Section 2.

One can thus account for the person-based notion of luck that creates tensions in the psychological literature in terms of the events-based account outlined here without thereby having to undermine the experimental results gained by those who have explored the person-based notion. That is, there is an explanation available of the studies that support a person-based conception of luck which conforms to the core events-based approach encapsulated in our account of luck described above. What is needed to resolve this difficulty is a conception of luck that conforms with a wide range of intuitions about luck along with a sensitivity to how ignorance on the part of the agents concerned (as identified, in part, in the psychological literature as an 'illusion of control') can lead to false and therefore misleading ascriptions of luck. The combination of L1 and L2 provides just such a conception of luck.

5. Concluding remarks

There are clearly further issues that could be explored in this regard, and we will here list just a few of them. First, there is the possible account that can be given of how, in detail, the characterisation of luck offered here can be adapted to accommodate the broad range of issues that have emerged in the psychological and philosophical literature. We recommend that this kind of study would best be undertaken on a case-by-case basis, since a general account would be apt to obscure specific features of each sub-debate. Second, there is the issue of how one might supplement the characterisation of luck offered here in order to provide a more specific account of the notion. There are several possibilities that might be explored in this regard, including a more detailed analysis of the manner in which one is to understand the notion of a possible world and the restrictions that can be placed on the range of possible worlds that are at issue in each case, along with a more fine-grained account of the notion of 'significance'. Third, there is the empirical issue of whether the apparent 'lucky' skills attributed to agents in the psychological literature are genuine skills at all. In contrast to the other two issues listed, this is an investigation for psychologists (as opposed to psychologists *and* philosophers) to undertake, at least in the first instance. It has two stages. The first is to identify whether there are any good grounds to think that a possible skill is being exhibited in these cases at all (whether, for instance, the success in question is statistically significant). Provided that there are grounds to think that skills might be exhibited here, the further issue is to determine what these skills might be and whether they can be accommodated in terms of standard psychological processes or whether parapsychological explanations might be needed.

References

Chandler, T. A., & Spies, C. J. (1984). Semantic differential placement of attributions and dimensions in four different groups. *Journal of Educational Psychology*, *76*, 1119–1127.

Cohen, J. (1960). *Chance, skill and luck*: *The psychology of guessing and gambling*. London: Pelican.

Dancy, J. (1985). *Introduction to contemporary epistemology*. Oxford: Basil Blackwell.

Darke, P. R., & Freedman, J. L. (1997a). The belief in good luck scale. *Journal of Research in Personality*, *31*, 486–511.

Darke, P. R., & Freedman, J. L. (1997b). Lucky events and beliefs in luck: Paradoxical effects on risk-taking. *Personality and Social Psychology Bulletin*, *23*, 378–388.

DeRose, K., & Warfield, T. (Eds.). (1999). *Skepticism: A contemporary reader*. Oxford: Oxford University Press.

Engel, M. (1992). Is epistemic luck compatible with knowledge? *The Southern Journal of Philosophy*, *30*, 59–75.

Fischhoff, B. (1976). Attribution theory and judgement under uncertainty. In J. H. Harvey, W. J. Ickes, & R. F. Kidd (Eds.), *New directions in attribution research*, Vol. 1. Hillsdale, NJ: Erlbaum.

Fiske, S. T., & Taylor, S. E. (1991). *Social cognition* (2nd ed). New York: McGraw-Hill.

Foley, R. (1984). Epistemic luck and the purely epistemic. *American Philosophical Quarterly*, *21*, 113–124.

Fumerton, R. (1995). *Metaepistemology and skepticism*. Lanham, MD: Rowman & Littlefield.

Gettier, E. (1963). Is justified true belief knowledge. *Analysis*, *23*, 121–123.

Gilovich, T., & Douglas, C. (1986). Biased evaluations of randomly determined gambling outcomes. *Journal of Experimental Social Psychology*, *22*, 228–241.

Gjelsvik, O. (1991). Dretske on knowledge and content. *Synthese*, *86*, 425–441.

Greco, J. (1995). A second paradox concerning responsibility and luck. *Metaphilosophy*, *26*, 81–96.

Hall, B. J. (1994). On epistemic luck. *The Southern Journal of Philosophy*, *32*, 79–84.

Harper, W. (1996). Knowledge and luck. *The Southern Journal of Philosophy*, *34*, 273–283.

Hayano, D. M. (1978). Strategies for the management of luck and action in an urban Poker Parlour. *Urban Life*, *6*, 475–488.

Heider, F. (1958). *The psychology of interpersonal relations*. New York: Wiley.

Heider, F. (1988). In M. Benesh-Weiner (Ed.), *The Notebooks*, Vol. 4. München-Weinheim, Germany: Psychologie Verlags Union.

Heller, M. (1999). The proper role for contextualism in an anti-luck epistemology. *Philosophical Perspectives*, *13*, 115–130.

Henslin, J. M. (1967). Craps and magic. *American Journal of Sociology*, *73*, 316–330.

Hewstone, M. (1989). *Causal attribution*: *From cognitive processes to collective beliefs*. Oxford: Blackwell.

Janoff-Bulman, R. (1992). *Shattered assumptions*: *Towards a new psychology of trauma*. New York: Free Press.

Johnson, J. T. (1986). The knowledge of what might have been: Affective and attributional consequences of near outcomes. *Personality and Social Psychology Bulletin*, *12*, 51–62.

Kahneman, D., & Varey, C. A. (1990). Propensities and counterfactuals: The loser that almost won. *Journal of Personality and Social Psychology*, *59*, 1101–1110.

Karabenick, S. A., & Addy, M. M. (1979). Locus of control and sex differences in skill and chance risk-taking conditions. *Journal of General Psychology*, *100*, 215–228.

Keren, G., & Wagenaar, W. A. (1985). On the psychology of playing blackjack: Normative and descriptive considerations with implications for decision theory. *Journal of Experimental Psychology: General*, *114*, 133–158.

Langer, E. J. (1975). The illusion of control. *Journal of Personality and Social Psychology*, *32*, 311–328.

Langer, E. J., & Roth, J. (1975). Heads I win, tails it's chance: The illusion of control as a function of the sequence of outcomes in a purely chance task. *Journal of Personality and Social Psychology*, *32*, 951–955.

Latus, A. (2000). Moral and epistemic luck. *Journal of Philosophical Research*, *25*, 149–172.

Lefcourt, H. M. (1991). Locus of control. In J. Robinson, P. Shaver, & L. Wrightman (Eds.), *Measures of personality and social psychological attitudes*. San Diego: Academic Press.

Lewis, D. (1973). *Counterfactuals*. Oxford: Blackwell.

Lewis, D. (1987). *On the plurality of worlds*. Oxford: Blackwell.

Loux, M. (Ed.). (1979). *The possible and the actual*. Ithaca, NJ: Cornell University Press.

Meyer, J. P. (1980). Causal attributions for success and failure: A multivariate investigation of dimensionality, formation, and consequences. *Journal of Personality and Social Psychology*, *38*, 704–715.

Meyer, J. P., & Koelbl, S. L. M. (1982). Dimensionality of students causal attributions for test performance. *Personality and Social Psychology Bulletin*, *8*, 31–36.

Miller, D. T., Turnbull, W., & McFarland, C. (1990). Counterfactual thinking and social perception: Thinking about what might have been. In M. P. Zanna (Ed.), *Advances in experimental social psychology*, Vol. 23. Orlando: Academic Press.

Morillo, C. R. (1984). Epistemic luck, naturalistic epistemology, and the ecology of knowledge. *Philosophical Studies*, *46*, 109–129.

Nagel, T. (1979). *Moral luck in his mortal questions*. Cambridge, UK: Cambridge University Press.

Nozick, R. (1981). *Philosophical explanations*. Oxford: Clarendon Press.

Pritchard, D. H. (2002). Recent work on radical skepticism. *American Philosophical Quarterly*, *39*, 215–257.

Pritchard, D. H. (2003). Virtue epistemology and epistemic luck. *Metaphilosophy*, *34*, 106–130; and reprinted in M. S. Brady & D. H. Pritchard (Eds.) *Moral and epistemic virtues*. Oxford: Basil Blackwell.

Pritchard, D. H. (2004). Epistemic luck. *Journal of Philosophical Research*, *29*, 193–222.

Rescher, N. (1995). *Luck*: *The brilliant randomness of everyday life*. New York: Farrar, Straus and Giroux.

Rotter, J. B., & Mulry, R. C. (1965). Internal versus external control of reinforcement and decision time. *Journal of Personality and Social Psychology*, *2*, 598–604.

Rush, J. H. (1986). What is parapsychology. In H. L. Edge, R. L. Morris, J. Palmer, & J. H. Rush (Eds.), *Foundations of parapsychology: Exploring the boundaries of human capability* (pp. 3–8). London: Routledge & Kegan Paul.

Russell, D. (1982). The causal dimension scale: A measure of how individuals perceive causes. *Journal of Personality and Social Psychology*, *42*, 1137–1145.

Shope, R. (1983). *The analysis of knowing*. Princeton, NJ: Princeton University Press.

Smith, M. D., Wiseman, R., & Harris, P. (in press). The relationship between 'luck' and psi. *Journal of the American Society for Psychical Research*.

Statman, D. (1991). Moral and Epistemic Luck. *Ratio*, *4*(New Series), 146–156.

Statman, D. (Ed.). (1993). *Moral luck*. Albany, NY: State University of New York Press.

Stroud, B. (1994). Scepticism, 'externalism' and the goal of epistemology. *Proceedings of the Aristotelian Society*, *68*(Supplementary Volume), 290–307.

Teigen, K. H. (1995). How good is good luck?: The role of counterfactual thinking in the perception of lucky and unlucky events. *European Journal of Social Psychology*, *25*, 281–302.

Teigen, K. H. (1996). Luck: The art of a near miss. *Scandinavian Journal of Psychology*, *37*, 156–171.

Teigen, K. H. (1997). Luck, envy, gratitude: It could have been different. *Scandinavian Journal of Psychology*, *38*, 318–323.

Teigen, K. H. (1998a). Hazards mean luck: Counterfactual thinking and perceptions of good and bad fortune in reports of dangerous situations and careless behaviour. *Scandinavian Journal of Psychology*, *39*, 235–248.

Teigen, K. H. (1998b). When the unreal if more likely than the real: Post hoc probability judgements and counterfactual closeness. *Thinking and Reasoning*, *4*, 147–177.

Teigen, K. H. (2003). When a small difference makes a large difference counterfactual thinking and luck. In D. R. Mandel, D. Hilton, & P. Catellani (Eds.), *The psychology of counterfactual thinking*. London: Routledge.

Tetlock, P. E. (1998). Close-call counterfactuals and belief-system defenses: I was not almost wrong but I was almost right. *Journal of Personality and Social Psychology*, *75*, 639–652.

Tetlock, P. E., & Lebow, R. N. (2001). Poking counterfactual holes in covering laws: Cognitive styles and historical reasoning. *American Political Science Review*, *95*, 829–843.

Unger, P. (1968). An analysis of factual knowledge. *Journal of Philosophy*, *65*, 157–170.

Unger, P. (1975). *Ignorance*: *A case for skepticism*. Oxford: Oxford University Press.

Vahid, H. (2001). Knowledge and varieties of epistemic luck. *Dialectica*, *55*, 350–372.

Wagenaar, W. A. (1988). *Paradoxes of gambling behaviour*. Hove, UK: Lawrence Erlbaum.

Wagenaar, W. A., & Keren, G. B. (1988). Chance and luck are not the same. *Journal of Behavioural Decision Making*, *1*, 65–75.

Weiner, B. (1986). *An attribution theory of achievement, motivation and emotion*. New York: Springer.

Weiner, B., Frieze, I. H., Kukla, A., Reed, I., Rest, S., & Rosenbaum, R. M. (1972). *Perceiving the causes of success and failure*. Morristown, NJ: General Learning Press.

Williams, B. (1979). Moral Luck. *Proceedings of the Aristotelian Society*, *50*(Supplementary Volume), 115–135.

Zagzebski, L. (1994). The inescapability of gettier problems. *Philosophical Quarterly*, *44*, 65–73.

Zagzebski, L. (1996). *Virtues of the mind*: *An inquiry into the nature of virtue and the ethical foundations of knowledge*. Cambridge, UK: Cambridge University Press.

Zagzebski, L. (1999). What is knowledge. In J. Greco, & E. Sosa (Eds.), *Epistemology* (pp. 92–116). Oxford: Basil Blackwell.