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## Understanding the coherence of the severity effect and optimism phenomena: Lessons from attention

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### ABSTRACT

Claims that optimism is a near-universal characteristic of human judgment seem to be at odds with recent results from the judgment and decision making literature suggesting that the likelihood of negative outcomes are overestimated relative to neutral outcomes. In an attempt to reconcile these seemingly contrasting phenomena, inspiration is drawn from the attention literature in which there is evidence that both positive and negative stimuli can have attentional privilege relative to neutral stimuli. This result provides a framework within which I consider three example phenomena that purport to demonstrate that people's likelihood estimates are optimistic: Wishful thinking; Unrealistic comparative optimism and Asymmetric belief updating. The framework clarifies the relationships between these phenomena and stimulates future research questions. Generally, whilst results from the first two phenomena appear reconcilable in this conceptualisation, further research is required in reconciling the third.

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A consensus in the psychological literature, both academic and popular, is that humans are prone to an almost universal optimism bias (see e.g., [Sharot, 2012](#)). The current paper focusses on optimism in likelihood estimates. One might define such optimism as an inappropriately high belief that a positively valenced event will occur, or an inappropriately low belief that a negatively valenced event will occur. Qualitatively, such optimism would be demonstrated by research findings that suggest likelihood estimates for positive events are greater than those for neutral events, or findings which suggest that likelihood estimates for neutral events are greater than those for negative events (holding all else constant). As recognised in [Slovic \(1966\)](#), the effect of event desirability in such an instance may be continuous (such that very positive events are perceived as more likely than moderately positive events for example), or categorical (very positive events are perceived as equally likely to occur as moderately positive events, but both are subjectively more likely than neutral or negative events).

To the extent that the ubiquity of optimism is accepted, a surprising result from the judgment and decision making literature is that participants seem to overestimate likelihoods of negative events, relative to neutral events ([Harris, Corner, & Hahn, 2009](#); [Risen & Gilovich, 2007](#); [Vosgerau, 2010](#)). Such a 'severity effect' appears to disprove any claim for the *universality* of optimism, but its existence also raises questions for the reconciliation of the probability judgment literature. How can this result co-exist with a literature that purports to demonstrate such ubiquitous optimism in people's likelihood judgments?

The present paper draws on theorising from the attention literature to develop a cogent theoretical framework. I subsequently consider different sources of evidence for optimism and discuss how they can be situated within such a framework. It becomes apparent that some effects fit more readily into this framework than others, whilst others can be reconciled with-

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out the need for such a 'fit'. For those that remain, these should consequently be considered separate phenomena. Alternatively, future research might of course disprove the existence of one or more of these effects. On this point, some might suggest that the much greater quantity of literature on optimism as opposed to the Severity effect suggests that the simplest reconciliation is to argue against the latter effect's existence. Of course, future empirical research might demonstrate this to be the correct answer. At present, however, there is direct empirical support for this effect, which has yet to receive direct critique. In addition, as will be seen below, evidence from lower levels of cognition (namely attention) is more consistent with the Severity effect, than with any other effect of event utility<sup>1</sup> on likelihood estimates. Finally, a consideration of how these effects can be considered together in this way is informative and useful in understanding how they relate to each other. As the Severity effect appears, at least on first inspection, to be the odd-one-out here, it is the phenomenon that is of most use in constraining the organising framework.

The paper will take three phenomena reported in the optimism literature as examples of how the present framework can be applied. The three phenomena to be used as exemplars are: (1) likelihood estimates for positive events are higher than for neutral events (e.g., Bar-Hillel, Budescu, & Amar, 2008; Massey, Simmons, & Armor, 2011; Simmons & Massey, 2012); (2) people believe negative [positive] future life events to be less [more] likely to occur to themselves than to others (e.g., Weinstein, 1980, 1982); (3) people update their likelihood estimates for future life events more in response to positive information than to negative information (e.g., Sharot, Korn, & Dolan, 2011).

Whilst a variety of phenomena have been brought under the banner of 'optimism' (see e.g., Kahneman, 2011), these three phenomena have been chosen carefully. Firstly, they all concern likelihood estimates about future events. Furthermore, (1) is the direct analogue for the Severity effect in the positive domain; (2) is the most used paradigm from which the optimism conclusion is derived; (3) purports to provide a direct motivation-based explanation for (2) – for which non-motivational explanations have recently dominated. Furthermore, as a relatively new and somewhat different methodology in the field, it is useful to show how (3) needs to be conceptualised such that its results can be compared with those from extant methods in the literature.

It is important to note that all three sets of findings have been questioned in the recent literature (on 1: Harris et al., 2009; Krizan & Windschitl, 2007; on 2: Hahn & Harris, 2014; Harris & Hahn, 2011; on 3: Harris, Shah, Catmur, Bird, & Hahn, 2013; Shah, Harris, Bird, Catmur, & Hahn, 2016; Yu & Chen, 2015). The reader will notice that the author of the current paper is well represented in these critiques. It is important to note at the outset that I remain sceptical about the status of these phenomena, and am not stepping back from those critiques. This article is not, however, intended to revisit those arguments, or even to respond to their critics (Shepperd, Klein, Waters, & Weinstein, 2013; but see Hahn & Harris, 2014, for some response). Rather, in the present article, I will consider the potential for a reconciliation of the seeming inconsistency between the Severity effect and these purported optimism phenomena, which are still well regarded in the literature (e.g., Shepperd, Waters, Weinstein, & Klein, 2015; Windschitl & Stuart, 2015). In so doing, I will provide a novel clarification of the conceptual relationship between the three demonstrations of optimism outlined above. Furthermore, in light of extant critiques of the methodologies employed, identifying general consistencies and inconsistencies among these phenomena provides insight both into the likely true status of the phenomena, and also into the coherence and thus plausibility of alternative explanations.

## 1. The severity effect

In the literature on the interpretation of verbal probability expressions (VPEs; e.g., 'likely'), interpretations have been shown to be susceptible to a range of context effects (e.g., Beyth-Marom, 1982). One of the largest influences on interpretations is the base rate of the event being described (Fischer & Jungermann, 1996; Wallsten, Fillenbaum, & Cox, 1986; Weber & Hilton, 1990) – that is, 'unlikely rain in the UK' would be seen as more likely than 'unlikely rain in the Sahara desert.' Once controlling for this effect, however, a further influence on the interpretations of VPEs is the severity of the event being described. Specifically, numerical translations of VPEs are systematically higher when the VPEs refer to negative events than to (relatively) neutral events. Bonnefon and Villejoubert (2006) termed this effect the 'severity bias,' and it has been observed in a variety of domains including health (Bonnefon & Villejoubert, 2006; Juanchich, Sirota, & Butler, 2012), financial investment outcomes (Juanchich et al., 2012), environmental concerns (Harris & Corner, 2011) and offender profiling (Villejoubert, Almond, & Alison, 2009). These studies have employed hypothetical vignettes in both the first (Bonnefon & Villejoubert, 2006; Harris & Corner, 2011, Studies 1 & 2; Juanchich et al., 2012) and third (Harris & Corner, 2011, Study 3; Villejoubert et al., 2009) persons. Harris and Corner (2011), among others (e.g., Juanchich et al., 2012), subsequently used the term 'severity effect' to label this phenomenon. In the current paper, I take the effect of negative utility on interpretations of VPEs as a specific instantiation of the Severity effect, but more generally I use the term to describe the phenomenon whereby likelihood estimates for negative outcomes are greater than for neutral outcomes (Harris et al., 2009; Risen & Gilovich, 2007; Vosgerau, 2010).

<sup>1</sup> I attempt to keep my current terminology consistent with the terms used in described papers. In my own use of terms, there is a degree of interchangeability, but 'valence' typically corresponds to a categorical distinction between negative, neutral and positive events, whilst 'utility' is a continuous term.

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