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# Motivated perception of probabilistic information



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## ABSTRACT

Desirability bias is the tendency to judge that, all else being equal, positive outcomes are more likely to occur than negative outcomes. The provision of probabilistic information about the likelihood that events will occur is typically viewed as a way to influence judgments by grounding them in objective information. Yet probabilistic information may be perceived differently when people are motivated to arrive at a particular conclusion, enabling the desirability bias. The present investigation explored how probabilistic information is used and perceived when people are motivated. In a game of chance, desirability bias was present for judgments about the likelihood of outcomes occurring to the self but not an unaffiliated other despite equal probabilities (Study 1). Probabilities were perceived as having more variance, both subjectively and in terms of probability spread (Studies 2, 3a, and 5), when participants were motivated to arrive at a particular conclusion (for the self or another person on the same team). Further, desirability bias was greater when probabilities were perceived as having more variance, either due to wide versus narrow probability ranges or subjective uncertainty (Studies 3b and 4). Together, these findings demonstrate that people perceive probabilistic information as having more variance when they are motivated to arrive at a conclusion and that this greater perceived variability contributes to bias in judgment.

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## 1. Introduction

The general tendency to believe that what is desired is likely to occur – a desirability bias – has been documented in a variety of populations and contexts and has been called one of the most important biases that characterize human thought (Kahneman, 2003; Taylor & Brown, 1988). Desirability bias is considered an important bias in part because people's judgments about what is likely to happen in the future influences how they behave, think, and feel in the present, with bias in these estimates resulting in potential harm (Edwards & Von Winterfeldt, 1986; Luce & Raiffa, 1957). It is well known that people tend to underweight or ignore probabilities when judging their likelihood of experiencing an event (Epley & Dunning,

2006; Kahneman & Miller, 1986). Yet little is known about how people *perceive* probability information when they are judging their likelihood of experiencing an event. The present investigation examined how people use and perceive objective probabilistic information about the likelihood of future outcomes when they are motivated to arrive at preferred conclusions for themselves or someone affiliated with them, versus when they are less motivated for an unaffiliated person. If perception of objective information differs when people are more versus less motivated, it has important implications for understanding the power of motivated reasoning as well as the utility of providing information to correct bias.

### 1.1. Desirability bias

Desirability bias has been defined as a bias in judgments of the likelihood of events that results from the desirability of the events. It is most clearly demonstrated

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in studies that reveal a systematic tendency for judgments to be biased in the direction of desires, such that, all else being equal, desirable events are judged to be more likely than undesirable events (Krizan & Windschitl, 2007; Lench, 2009). Across a variety of populations and for a multitude of events, people judge that the future will be consistent with their desires. In the unrealistic optimism literature, for example, people judge that they are more likely than the average person to experience positive life events and less likely than the average person to experience negative life events (Weinstein, 1980), even when the positive and negative events are associated with the same objective likelihood (Lench & Ditto, 2008).<sup>1</sup> Even in games of chance, where people have no control over the outcomes of the game and have limited information, people judge that they will receive desirable outcomes and will not receive undesirable outcomes that are equally objectively likely to occur during the game (Krizan & Windschitl, 2007; Lench & Ditto, 2008; Marks, 1951).

This is not to say that people judge whatever they want to be true regardless of evidence. There tends to be a moderate correspondence between people's judgments that they will experience various events and their actual level of risk, the base rate they perceive for the event, and the objective probability of receiving an outcome (Krizan & Windschitl, 2007; Lench & Ditto, 2008; McKenna, Warburton, & Winwood, 1993; Price, Pentecost, & Voth, 2002; Rothman, Klein, & Weinstein, 1996). Yet within this background of general sensitivity to evidence, people make judgments consistent with their desires, particularly when probabilities are open to interpretation (e.g., 50% of the cards are marked). Less bias is observed when probabilities are less open to interpretation (e.g., 95% of the cards are marked; Krizan & Windschitl, 2007). Thus the degree to which objective probabilities are open to interpretation is an important contributor to desirability bias in judgment. Below, we further suggest that motivations to arrive at a particular conclusion might lead people to perceive probabilities as more open to interpretation than they actually are, and that this perceived variance might contribute to desirability bias.

## 1.2. Motivated reasoning and perception

Motivated reasoning accounts suggest that how people respond to and perceive information can be altered by their motivations to arrive at a particular conclusion (e.g., Ditto & Lopez, 1992; Gilovich, 1991; Kunda, 1990). Probabilistic information is frequently treated as objective information that people simply assimilate to judge the likelihood of events (Edwards, 1962) and failure to appropriately use probabilistic information has been viewed as

the result of a lack of experience with probabilities (Brown & Morley, 2007; Kahneman & Tversky, 1979). Yet evidence suggests that perceptions of probability information can be altered by the context in which that information is provided (e.g., if probabilities are provided for one outcome versus simultaneously for two outcomes; Hsee, 1996). In the present investigation we focused on how the context of making judgments when motivated to arrive at a conclusion (for the self or an affiliated other) as opposed to when less motivated (for an unaffiliated other) might influence perception of probabilistic information. People are typically motivated to make optimistic judgments for themselves, but are less motivated to arrive at a particular conclusion for another person, particularly if that person is a stranger (Hall & Taylor, 1976; Hoorens & Buunk, 1993; Pahl, Etser, & White, 2009; Regan, Snyder, & Kassin, 1995; Vallone, Griffin, Lin, & Ross, 1990; Van Lange, 1991). If motivations alter the perception of probabilistic information, identical objective probabilities will have a different subjective meaning when people apply that information to the possibility of outcomes in their own future (or the future of an affiliated other) versus the future of an unaffiliated other.

There is evidence that *what* information people consider varies for themselves versus other people. Probability information tends to be ignored or underweighted for the self compared to others. Generally, people view others as more similar to the average than they see themselves (Pronin, Berger, & Molouki, 2007) and as a result may be more likely to use average information to judge others and individuating information to judge themselves (Kahneman et al., 1986). For example, people rely on their own best performance and their potential when judging their ability but average past performance when judging others' ability (Williams & Gilovich, 2012). Similarly, people focus on their plans when estimating how long it will take them to complete tasks, but focus on information from similar past experiences to estimate how long it will take others (Buehler, Griffin, & Ross, 1994; Helzer & Dunning, 2012; Koehler & Poon, 2006). Thus, when people have unique insight about themselves that they do not have about another person, they overweight that individuating information and underweight normative and probabilistic information.

In contrast, in the present investigation, we were interested in *how* people perceive probability information, not *what* information they use when multiple types of information are available. An unexplored possibility is that motivations to arrive at a particular conclusion may alter subjective perceptions of probabilistic information. Motivation to arrive at a particular conclusion increases skepticism about and analysis of information (Ditto & Boardman, 1995; Ditto & Lopez, 1992; Ditto, Munro, Apanovich, Scepansky, & Lockhart, 2003). As a result, motivated people might view objective information as more open to interpretation (i.e., more variable). If motivations to arrive at a particular conclusion change perception of the variance associated with objective probability information, then any probability information, regardless of objective clarity, could be interpreted as variable and leave judgments susceptible to the impact of desires.

<sup>1</sup> The pervasiveness of unrealistic optimism may partially result from factors other than the desirability of the events, including that people have difficulty comparing themselves to an average and may focus only on themselves (Chambers, Windschitl, & Suls, 2003), or might have a different conception of average than researchers (Harris & Hahn, 2011). However, these criticisms are limited to studies that ask participants to compare themselves to an average peer and are not relevant to studies that use other methodological paradigms and questions.

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