Organizational Behavior and Human Decision Processes 111 (2010) 33–47

Contents lists available at ScienceDirect

Organizational Behavior and Human Decision Processes

journal homepage: www.elsevier.com/locate/obhdp

The desirability bias in predictions: Going optimistic without leaving realism

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ARTICLE INFO

Article history:
Received 20 August 2008
Accepted 16 August 2009
Available online 12 September 2009

Accepted by Maurice Schweitzer

Keywords:
Desirability bias
Wishful thinking
Optimism
Motivated reasoning
Likelihood judgment
Subjective probability

ABSTRACT

Does desire for an outcome inflate optimism? Previous experiments have produced mixed results regarding the *desirability bias*, with the bulk of supportive findings coming from one paradigm—the classic *marked-card paradigm* in which people make discrete predictions about desirable or undesirable cards being drawn from decks. We introduce a biased-guessing account for the effects from this paradigm, which posits that people are often realistic in their likelihood assessments, but when making a subjectively arbitrary prediction (a guess), they will tend to guess in a desired direction. In order to establish the validity of the biased-guessing account and to distinguish it from other accounts, we conducted five experiments that tested the desirability bias within the paradigm and novel extensions of it. In addition to supporting the biased-guessing account, the findings illustrate the critical role of moderators (e.g., type of outcome, type of forecast) for fully understanding and predicting desirability biases.

Introduction

Julie, who works at the west branch of a company, gets a stunner from her morning newspaper: The corporate office is closing either the east or west branch, to be announced later. Julie scours the rest of the story looking for clues about which branch will close.

While vacationing in Seattle, Bob is tickled to hear that if the weather conditions are right, the Blue Angels Squadron will perform a flight demonstration near his hotel. He promptly checks several weather forecasts.

Does the fact that Julie wants to keep her job and Bob wants to see the flight demonstration cause them to be biased in an optimistic direction, with Julie expecting that her branch will be safe and Bob expecting the weather to cooperate? In more general terms, the question being raised is whether people tend to show a *desirability bias*—an effect in which the desire for an outcome inflates optimism about that outcome.

Research on the desirability bias (also known as the *wishful thinking effect*) has not produced a consistent set of findings. Perhaps the most widely known studies that have directly tested the desirability bias used a paradigm developed by Marks (1951) in which people are asked to make dichotomous predictions about whether a marked card will be drawn from a deck (e.g., Crandall, Solomon, & Kellaway, 1955; Irwin 1953; Irwin & Metzger, 1966). These studies tend to produce robust desirability biases—that is, participants predict a marked card more often when the drawing of a marked card would result in a monetary gain. However, outside this marked-card paradigm, detection of a consistent desirability bias seems to be more elusive (see Bar-Hillel & Budescu, 1995; Bar-Hillel, Budescu, & Amar, 2008a, 2008b; for review see Krizan & Windschitl, 2007a). To date, relatively little is known about the underlying causal mechanisms that yield desirability biases in the marked-card paradigm, and why these mechanisms have not produced consistent effects outside the paradigm.

Therefore, the overall goal of the present research was to identify the key mechanisms accounting for the desirability biases in the marked-card paradigm, and to investigate the applicability of these mechanisms when key aspects of the paradigm are altered. Addressing these issues is critical for achieving a better understanding of how desires impact people's expectations. In the next sections, we first briefly summarize findings from a recent meta-analysis on desirability effects, before then discussing possible mechanisms that will be tested in our experiments.

Evidence regarding the desirability bias

Krizan and Windschitl (2007a) recently conducted meta-analysis of studies in which the desirability of outcomes was experimentally manipulated and in which the dependent variable was some

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doi:10.1016/j.obhdp.2009.08.003

form of a forecast. The analysis was also restricted to cases in which respondents did not have an ability to control the outcome; as illustrated in the opening vignettes, such cases are common and important in everyday life. Each study in the analysis was classified into one of four categories, defined by whether the study concerned outcomes that were purely stochastic in nature (e.g., card-draw outcomes) or had some nonstochastic determinants (e.g., competition outcomes), and whether participants were asked to provide a discrete outcome prediction or some form of a likelihood or confidence judgment about an outcome. For each of these four categories, Fig. 1 displays the number of studies that were located for the review and the relevant meta-analyzed effect sizes for the desirability bias. The figure reveals some critical complexities. One cell is entirely empty because no studies in that category were located despite a concerted search. More importantly, studies in the stochastic-predictions cell (upper left) appear to produce large desirability effects, whereas the overall effect in the stochastic-likelihood cell is essentially nil, and the overall effect in the nonstochastic-likelihood cell is small yet significant. In short, one cell stands out—studies in the stochastic-predictions cell have produced desirability biases at a level and consistency that is not matched by other cells. Naturally, there is good reason peer deeper into the studies and effects within that cell.

Of the 14 studies in that cell, 12 involved the classic marked-card paradigm or a close variant (e.g., Crandall et al., 1955; Irwin 1953; Marks, 1951). In the prototypical study, participants are first told the proportion of cards that are marked (which might be manipulated from 10% to 90%) and then are told whether drawing a marked card will mean that they gain or lose some specified amount of money (or points). Participants make predictions about numerous decks before learning anything about the outcomes of the card draws. Of the 12 studies using this marked-card paradigm and soliciting dichotomous outcome predictions, all 12 produced significant desirability biases (see Krizan & Windschitl, 2007a). That is, participants predicted a marked card more often when a marked card would result in a gain rather than a loss. The bias tended to be largest for decks that contained 50% marked cards. Monetary and instructional incentives to be accurate in one's predictions did not tend to reduce the size of the desirability bias in this paradigm. Because findings from the marked-card paradigm have tended to be robust and replicable, they have become the hallmark example of scientific evidence that people are prone to suffer from a desirability bias in their forecasts.

Possible mechanisms

Although numerous studies have produced a desirability bias in the marked-card paradigm, explanations as to how such a bias operates or why it might be greater in some paradigms than in others has tended to be discussed in only a cursory fashion (notable exceptions include Budescu & Bruderman, 1995; Price & Marquez, 2005). In this paper, we explicitly consider four types of accounts for the desirability bias in the marked-card paradigm.

The first account refers to an artifactual explanation that has not been adequately tested. In previous studies using the marked-card paradigm, participants were told by the experimenter what the value of drawing a marked card would be. The same experimenter would also orally solicit a prediction about whether the drawn card would be marked. This procedure is clearly vulnerable to experimenter bias and demand characteristics (e.g., Rosenthal & Fode, 1963). It is easy to imagine that the way in which an experimenter asks the "Will it be a marked card?" question could be different if drawing a marked card would have good rather than bad consequences for the participant, and it is easy to imagine that the respondent might feel some pressure to respond in a certain way when the experimenter is directly posing the questions.

The second type of account, which we will call the *biased-evaluation account*, posits that desire for an outcome biases the way in which the evidence for that outcome is perceived or evaluated. In the broader literature on motivated reasoning, there are several empirical demonstrations that suggest that evidence for a desired conclusion is viewed as stronger or with less skepticism than would the same evidence for an undesired conclusion (for reviews see Balcetis, 2008; Kunda, 1990; Pyszczynski & Greenberg, 1987; Trope & Liberman, 1996; see also Krizan & Windschitl, 2007a). As applied to the marked-card paradigm, the biased-evaluation account (or any variant thereof) would suggest that the stated proportion of marked cards somehow seems larger or more favorable when marked cards are desirable rather than undesirable. Although some readers might question whether a precise and fully relevant statement about the proportion of marked cards (e.g., "4 of the 10 cards are marked") could be differentially evaluated, we note that there have been numerous studies showing that even the most precise numeric information can be viewed as bigger or smaller as a function of context or presentational features (see e.g., Hsee, 1996; Kirkpatrick & Epstein, 1992; Klein, 1997; Peters et al., 2006; Windschitl, Martin, & Flugstad; 2002; Windschitl & Weber, 1999). Therefore, it is theoretically tenable that desire for a marked card could make "4 out of 10" seem larger than it otherwise would.

The third type of account, which we will call the *biased-threshold account,* assumes that the evaluation of the evidence for a marked card is unbiased, but the decision threshold for predicting that a marked card will be drawn is lower when the marked cards are desired rather than undesired. Therefore, when the subjective probability of a marked card is 40%, this might trigger a prediction

	Discrete Outcome Prediction	Likelihood Judgment
Stochastic	14 Studies (12 from Marked-Card Paradigm) 13 Had Significant Effects Overall Odds Ratio: OR = 2.26*	9 Studies 2 Had Significant Effects Overall Effect Size: g = 0.01 (ns)
Non-Stochastic	0 Studies	7 Studies 4 Had Significant Effects Overall Effect Size: g = 0.20*

Fig. 1. A summarized representation of the experimental studies on the desirability bias that met the inclusion criteria for Krizan & Windschitl (2007a) review and meta-analysis. Note: * Indicates that the 95% confidence interval around the population estimate of the standardized mean difference or odds-ratio excluded 0 or 1, respectively.