



Wishful Thinking about the Future: Does Desire Impact Optimism?

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Abstract

The notion that desire for an outcome inflates optimism about that outcome has been dubbed the *desirability bias* or *wishful thinking*. In this paper, we discuss the importance of distinguishing wishful thinking from the more general concept of motivated reasoning, and we explain why documenting overoptimism or correlations between preferences and optimism is not sufficient to infer a desirability bias. Then, we discuss results from a review and meta-analysis of the experimental literature on wishful thinking. These findings, in conjunction with more recent work, not only highlight important moderators and mediators of the desirability bias but also point out limitations of the empirical research on the bias. These results also reveal an important difference between how likelihood judgments and discrete outcome predictions respond to desirability of outcomes. We conclude by presenting avenues for future research useful for understanding wishful thinking's manifestation in everyday environments and its integration with related phenomena.

- A soon-to-be bride and groom who hope the weather will cooperate on their wedding day.
- An Illinois grade-schooler who thinks it would be ‘pretty cool’ if Chicago was indeed selected as the host city for the 2016 Olympics.
- An office worker who, with a Duke Blue Devils victory, could win the distinction and money for having the best set of NCAA Tournament predictions.
- A Democrat from Texas hoping the news from the swing states does not disappoint.

Will the fact that these people strongly desire a particular outcome inflate their optimism about that outcome? The notion that such desires have a causal impact on optimism has been dubbed the *desirability bias* and is sometimes referred to as *wishful thinking*. To most people, wishful thinking might be a truism. George Orwell (1945) wrote that ‘people can foresee the future only when it coincides with their own wishes’, and perusal of New York Times archives over the last few years revealed many uses of the term, from apparent wishful whims about topics from sports

(e.g., who will win the NBA playoffs) to war (e.g., what is the likelihood that warring factions in Baghdad will reach a settlement). In everyday discourse, there seems to be little hesitation to suggest that someone's hopes fueled their overoptimism. Indeed, a recent study confirms that people generally believe others are optimistically biased about future outcomes (Armor, Massey, & Sackett, 2008).

Among social psychologists, wishful thinking not only seems like a truism, but it also seems well supported by various empirical findings and theoretical conceptualizations. Papers on the general topic of motivated reasoning describe various ways in which motivations influence cognitions, often in a way that enhances or protects a desirable self-view (for reviews, see Balcetis, 2007; Kunda, 1990; Roese & Olson, 2007; Trope & Liberman, 1996). Moreover, there is a host of more specific phenomena for which motivation-triggered bias is at least one possible explanation (see, e.g., Dawson, Gilovich, & Reagan, 2002; Kunda, 1987; Roese & Olson, 2007; Taylor & Brown, 1988; Tetlock & Levi, 1982). It doesn't seem like much of a stretch to assume these phenomena directly support the notion that desires systematically inflate optimism.

So, if it already seems clear that desires do inflate optimism, why are we writing a paper on the desirability bias? We argue that the empirical evidence for the desirability bias (and its mediators and moderators) is actually quite thin, and that there are numerous avenues for interesting and important research regarding this phenomenon. In the next two sections of the paper, we make two important points about distinctions between the desirability bias and other phenomena. First, we argue that the question of whether and how desires bias optimism is unique and cannot merely be treated as a generic question of whether motivations influence reasoning or judgment. Second, we describe why documenting overoptimism or correlational links between desires and optimism is not sufficient for answering the specific question of whether desires *inflate* optimism. After making these distinctions, we turn to a discussion of a 2007 meta-analysis of studies that employed experimental methods to directly test for desirability biases (Krizan & Windschitl, 2007a). The findings from this meta-analysis, in conjunction with other more recent studies, not only highlight important moderators and mediators of the desirability bias but also point out some severe limitations of the empirical research on the bias. We end the paper by presenting important avenues for future research on wishful thinking.

Before proceeding, it should be noted that, consistent with how most researchers have used the terms *wishful thinking* and *desirability bias*, this paper focuses on the bias in situations for which a person would *not* expect to influence the target outcome, such as the situations listed at the beginning of the paper. As discussed later, studying overoptimism when people have control over the outcome is important, but it is considerably different from a conceptual point of view. When people have some outcome control, they can assume that they will take strong steps to facilitate a desired outcome

and prevent the undesired outcome. Therefore, the question of whether and why people would be overoptimistic for desired outcomes under partial control might involve issues of self-efficacy, goal commitment, and effort expenditure – issues not addressed here (but see Bandura, 1997; Henry & Sniezek, 1993).

Wishful Thinking Is Distinct from Motivated Reasoning

As mentioned above, papers on motivated reasoning have described various ways in which motivations can influence cognitions (for reviews, see Balcetis, 2007; Kunda, 1990; Roese & Olson, 2007; Trope & Liberman, 1996). For example, people evaluate tests as more or less valid given a good or a bad performance, respectively (Wyer & Frey, 1983), and downplay the convincingness of a claim when it suggests a negative outcome for themselves (Kunda, 1987). The notion of motivated reasoning can be applied to almost any sort of judgment, but the notion of wishful thinking, as we have defined it, applies only to forecasts. Unlike with many types of judgments that would never be definitely deemed accurate or inaccurate, forecasts are often subjected to a ‘moment of truth’, when a person learns whether the event being forecasted does or does not occur. Therefore, there might be processes and considerations behind forecasts and wishful thinking that are rather distinct from the processes and considerations behind other judgments prone to motivated-reasoning effects. First, people might be reluctant to become too optimistic about desirable outcomes in order to avoid potential disappointment, thus lowering their expectations and ‘bracing for loss’ (e.g., Shepperd & McNulty, 2002; Shepperd, Ouellette, & Fernandez, 1996; Van Dijk, Zeelenberg, & van der Pligt, 2003). Second, the ever-increasing temporal proximity of future outcomes might constrain the influence of one’s preferences on forecasts as people begin to think in a more concrete and critical fashion about outcomes closer in time (e.g., Armor & Sackett, 2006; Gilovich, Kerr, & Medvec, 1993; Trope & Liberman, 2003). Third, even if inclined, individuals might be reluctant to express optimism about a desirable outcome due to superstitions or magical beliefs that such expressions ‘tempt fate’ or might influence (i.e., ‘jinx’) the outcome itself (e.g., Pronin, Wegner, McCarthy, & Rodriguez, 2006; Risen & Gilovich, 2007, 2008). These observations not only suggest that there might be unique tethers to people’s optimism about the future (tethers not necessarily relevant to other forms of motivated reasoning), but also suggest ways in which outcome desirability can actually *reduce* optimism in certain contexts (see Krizan & Windschitl, 2007a for discussion).

Overoptimism Per Se and Optimism–Preference Correlations Are Not Sufficient to Infer Wishful Thinking

Although we have suggested that wishful thinking might be less pervasive than most of us think, doesn’t the fact that people often express unwarranted

optimism go against this claim? The psychological literature is indeed replete with examples of rampant overoptimism (see Armor & Taylor, 1998; Buehler, Griffin, & Ross, 2002, for reviews). For example, people believe they are less likely than others to suffer various illnesses (e.g., Weinstein, 1980), overestimate the duration of their romantic relationships (Buehler, Griffin, & Ross, 1995), underestimate their tax completion times (Buehler, Griffin, & MacDonald, 1997), and overestimate their likelihood of having answered general-knowledge questions correctly (Lichtenstein & Fischhoff, 1977). One reason why wishful thinking is so widely accepted as a potent force behind people's forecasts is precisely because it offers a convenient explanation for examples of overoptimism just noted.

However, overoptimism in itself does *not* constitute evidence for wishful thinking; there are a variety of psychological factors that can produce overoptimism without assuming any motivational bias. For example, people might express comparative optimism because of cognitive egocentrism (e.g., Chambers & Windschitl, 2004); they might underestimate likelihoods of contracting a disease because they've been inadequately informed about the conditions that make a person vulnerable to the disease (e.g., Fischhoff, Lichtenstein, Slovic, Derby, & Keeney, 1981); and they might be overly optimistic about a roulette marble landing on a desired slot because of a gambler's fallacy (e.g., Jarvik, 1951). Even for phenomena such as overconfidence effects and hindsight bias, non-motivated accounts offer compelling explanations for major findings (see, e.g., Fischhoff, 1975; Klayman, Soll, Gonzalez-Vallejo, & Barlas, 1999).

Another type of finding that might at first seem to reflect strong support for wishful thinking is the often observed correlation between people's preferences and expectations. For example, people's preferences for political and sporting competitors are potent predictors of their expectations about the winner (e.g., Babad, 1997; Granberg & Brent, 1983; Ogburn, 1934; Wann & Dolan, 1994). However, these correlations do not isolate the *causal* influence of preferences on expectations. For example, within a political context, people's knowledge about a political candidate might drive *both* their preferences and their expectations regarding that candidate's performance in an election, or their expectations of the winner might lead them to switch their preferences (e.g., Granberg & Brent, 1983; Kay, Jimenez, & Jost, 2002). We should acknowledge that it is conceivable to use correlations between preferences and expectations as a means of assessing the desirability bias, if the issue of reverse causality is solved and if third variables (such as knowledge) are controlled or ruled out. However, this is a very difficult task. To adequately rule out knowledge as a problematic third variable, a researcher must control not only for *amount* of knowledge, but also for *content*. Regarding the above example, a researcher would need to control whether participants learned that a candidate was thoughtful (which could drive both liking and expectations about the candidate) or impetuous. Correlational studies on the desirability bias tend not to address this thorny

	Discrete Outcome Prediction	Likelihood Judgment
Stochastic	14 Studies (12 from Marked-Card Paradigm) 13 had significant effects Overall Odds Ratio: $OR = 2.26^*$ 95% CI: 1.89–2.71	9 Studies 2 had significant effects Overall Effect Size: $g = 0.01$ (ns) 95% CI: -.10–.12
Non-Stochastic	0 Studies	7 Studies 4 Had Significant Effects Overall Effect Size: $g = 0.20^*$ 95% CI: .08–.31

Note. * Indicates that the 95% confidence interval around the population estimate of the standardized mean difference or odds-ratio excluded 0 or 1, respectively.

Figure 1 A summarized representation of the experimental studies on the desirability bias that met the inclusion criteria for Krizan and Windschitl's (2007a) review and meta-analysis.

problem, which means that the preference–expectation links in those studies can provide only tentative rather than direct support for the desirability bias.

Findings from Direct Tests of Wishful Thinking

To best examine the causal influence of outcome desirability on optimism, one must use an experimental design in which outcome desirability is systematically manipulated and participants are asked to provide some form of forecast about the outcome. We will now discuss our recent quantitative synthesis of studies using such designs (from Krizan & Windschitl, 2007a).

After a thorough search of published and unpublished literature, we located a total of only 30 studies, which seems a surprisingly low number given the popularity and importance of the topic. In organizing the studies for analysis, we classified each study that tested the desirability bias hypothesis 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 non-stochastic determinants (e.g., competition outcomes), and whether participants were asked to provide a discrete outcome prediction (e.g., will/won't win) or some form of a likelihood or confidence judgment (e.g., 60% likely). As will soon become apparent, these features proved to be critical for understanding when and why the desirability bias is likely to manifest. For each of these four categories, Figure 1 displays the number of studies available, the relevant meta-analyzed effect size, and the associated 95% confidence interval. The figure reveals some critical complexities. First, there were important asymmetries in what types of studies have been conducted to examine wishful thinking. Note that no studies were located that examined outcome predictions about non-stochastic events. It is also

evident that the majority of studies employed stochastic outcomes, perhaps due to a large amount of experimental control they afford. Second, there were important asymmetries in the extent to which consistent desirability biases were present for each type of study. We address the implications of these findings below.

Desirability biases in naturalistic domains

Perhaps the most intriguing examples of wishful thinking involve 'naturalistic' events (e.g., competitions) whose outcomes are not determined by strictly random processes. However, as seen in Figure 1, studies examining naturalistic events were scarce – only seven were located, and all of those assessed subjective likelihood. To complicate matters further, these studies are quite heterogeneous in the methods used to test for desirability biases. Outcomes involved ranged from hypothetical scenarios to competitions and stock market trends, while desirability manipulations usually involved monetary incentives (e.g., Bar-Hillel & Budescu, 1995; Krizan & Windschitl, 2007b). Although there was an overall desirability effect across these studies, it showed substantial variability as it seemed to depend on other factors (e.g., the availability of evidence; Klein, 1999; Krizan & Windschitl, 2007b). The small number of studies prevented any firm conclusions about the general importance of such moderating factors, however, and shows the necessity for a deeper empirical examination of how desires impact predictions of non-stochastic, naturalistic outcomes.

Desirability biases in games of chance

As seen in Figure 1, the prototypical investigation of wishful thinking involved predictions of chance outcomes. Critically, studies that examined outcome predictions within games of chance yielded the strongest and most consistent effect size in the meta-analysis (see Figure 1). Out of 14 such studies, 12 involved the classic marked-card paradigm (or a close variant), 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; 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. The typical finding is that participants predicted a marked card more often when a marked card was said to result in a gain rather than a loss (i.e., a desirability effect). More targeted analyses also revealed the following. First, the bias tends to be the largest for decks that are said to contain 50% marked cards and 50% unmarked cards; the effects reduce in size as the proportion of marked and unmarked

cards becomes more uneven. Second, monetary and instructional incentives to be accurate in one's predictions do not tend to reduce the size of the desirability bias in this paradigm (see Krizan & Windschitl, 2007a). Third, the effects do not seem to result from illusory perceptions of control (Budescu & Bruderman, 1995). Because findings from the marked card paradigm involving outcome predictions 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. Thus, understanding psychological processes responsible for desirability biases regarding stochastic outcomes is of high importance.

In contrast to outcome predictions, expressions of *subjective likelihood* regarding stochastic outcomes do not seem to be sensitive to outcome desirability – there was no evidence that people assign higher probabilities to desirable (relative to undesirable) stochastic outcomes (see Figure 1). Despite the clear difference between outcome predictions' and likelihood judgments' responsiveness to outcome desirability, no systematic accounts for this difference have yet been fully substantiated (but see Price & Marquez, 2005; Windschitl, Smith, Rose, & Krizan, 2009).

Conclusions from the meta-analysis

In short, findings from experimental tests of wishful thinking were informative although limited. Unfortunately, there were no studies that examined outcome predictions about non-stochastic outcomes, and studies that examined likelihood judgments for said outcomes yielded mixed findings. Perhaps more importantly, studies looking at predictions of stochastic outcomes produced large desirability effects, whereas those involving likelihood judgments essentially produced null effects (see Figure 1). In sum, as of our 2007 review and meta-analysis, the direct evidence for wishful thinking was, at best, mixed.

Recent work not included in the meta-analysis

Recent work conducted since the review further supports conclusions from the meta-analysis and is starting to shed more light on processes that must be considered when explaining results that are, or appear to be, examples of desirability bias. In our recent studies (Windschitl et al., 2009), we demonstrated a robust desirability bias in an improved version of the marked card paradigm. The most notable improvement was to remove the potential for demand characteristics and experimenter bias. In the classic version of the marked card paradigm (e.g., Irwin, 1953), the experimenter communicated the value of each card draw and solicited participants' predictions, potentially influencing participants' responses with unintentional cues about which card should be expected. To remove these concerns, our new paradigm still involved real decks, but a computer program was used

to inform participants about the potential value of a card and to solicit participants' responses.

In addition to demonstrating a robust desirability bias in an improved version of the marked card paradigm, we also confirmed that the desirability bias usually disappears when likelihood judgments, rather than discrete predictions, are solicited. Moreover, we found that when participants were asked to make predictions about the correct answers to trivia questions – and were exposed to the same desirability manipulation as in our marked card paradigm, such that some answers were more desired than others – the desirability bias was essentially nil, except under a special condition. Namely, when we used trivia questions for which the two possible answers to a question were clearly equal in their strength or plausibility (i.e., ridiculously difficult questions), *then* a desirability bias began to emerge.

We believe that this result pattern is consistent with the idea that biased guessing is a major reason why desirability biases are robust for some predictions. That is, when people's predictions are subjectively arbitrary (i.e., a guess), they will tend to guess in an optimistic rather than a pessimistic direction. Arbitrary guessing would be quite relevant to making predictions about card draws (particularly when the number or marked and unmarked cards is equivalent, but also when not equivalent; see Windschitl et al., 2009). Arbitrary guessing would also be relevant to trivia questions for which two possible answers seem equally plausible. Other accounts for desirability bias would have a difficult time explaining the observed pattern of results. For example, accounts that suggest that desires bias evidence evaluations would presumably predict that desirability biases would emerge in all the studies described in the two preceding paragraphs (see e.g., Balcetis, 2007; Krizan & Windschitl, 2007a; Kunda, 1990; Trope & Liberman, 1996). Similarly, accounts suggesting decision thresholds for predicting an outcome are lower for desired rather than undesired outcomes would presumably predict that desirability biases would be comparable whether the outcome is a card draw or a trivia answer (see Price & Marquez, 2005).

Another line of work that has intriguing potential implications for conceptions of wishful thinking is by Vosgerau (forthcoming). He proposed the arousal-likelihood misattribution hypothesis; namely, that people's likelihood estimates for both desirable and undesirable outcomes (relative to neutral ones) can be increased when people misattribute arousal about their stake in the outcome to the likelihood of the outcome occurring. In a key study, likelihood judgments about outcomes were higher when the outcome was positive or negative for the respondent, rather than neutral. Another study demonstrated that imagining watching a soccer game live (more arousing) rather than with a tape delay (less arousing) caused likelihood judgments about the favorite team winning and judgments about the favorite team losing to *both* increase. Vosgerau's (forthcoming) ideas also suggest that desire can inflate both optimism and pessimism via changes

in arousal, and detecting this influence would be dependent on the framing or context in which a likelihood judgment is solicited.

Finally, recent work by Bar-Hillel, Budescu, & Amar (2008a, see also 2008b) demonstrated what first appeared to be a clear desirability bias. Participants were asked to estimate the likelihoods of teams winning their upcoming World Cup soccer games. For each game, they were also told they would receive a monetary reward if a given team (which we will call the target team) won. This desirability manipulation had a significant influence on likelihood estimates, such that desire seemed to be inflating optimism. However, in a follow-up study, Bar-Hillel et al. (2008) tested whether merely singling out the target team (or 'marking' it) was enough to make the team more salient and trigger inflation in likelihood estimates. Indeed, such a simple salience manipulation in the questionnaire (replacing the monetary reward) was enough to cause results resembling the desirability effect. Therefore, it was not necessarily the desirability of the outcomes that produced the original effect. Their work highlights the importance of manipulating not just whether an outcome is made desirable or not (which is likely to have confounds such as the 'marking' mentioned above), but perhaps also manipulating the *degree* of desirability.

New Avenues for Research on Wishful Thinking: Toward a Deeper Understanding

Thus far, we have argued that the plethora of research on motivated reasoning, on overoptimism, and on the preference–expectations correlations does not in itself constitute direct evidence for wishful thinking. We have also discussed a 2007 review and meta-analysis which revealed that the empirical literature on wishful thinking is limited and produced mixed results. Three more recent empirical papers (e.g., Bar-Hillel et al., 2008a, Vosgerau, forthcoming; Windschitl et al., 2009) are consistent with our claim that although desirability effects can be robust when outcome predictions are the dependent variables, there is still little evidence that outcome desirability per se inflates optimism in the form of subjective likelihoods. At this point, a reader might view this analysis as presenting a rather gloomy assessment and forecast for research on wishful thinking. Cheer up, though, because we believe there are a variety of avenues for important and interesting research on this important topic.

First, we see the discrepancy between findings on motivated reasoning research (typically demonstrating strong self-serving effects) and findings from wishful thinking research (mixed effects) as intriguing and worthy of additional theoretical and empirical attention. We have already described some of the conceptual differences between motivated reasoning contexts and wishful thinking contexts, but more work is needed. For example, if people tend to scrutinize information favorable to the self less than information unfavorable to the self (see Edwards & Smith, 1996; Ditto & Lopez,

1992; Dunning, 2003; Kunda, 1990; Trope & Liberman, 1996), then it would seem that people would scrutinize information that supports a preferred outcome less than information that does not, yielding a robust wishful thinking effect. However, might there be something special about the role the self plays in the former but not the latter? Even a very strong preference for a particular outcome might not have much relevance to core aspects of the self, and therefore would not trigger the scrutiny of inconsistent information usually observed with highly self-relevant outcomes that might involve many areas of the self-concept (e.g., Wyer & Frey, 1983).

A second and related question, and one that is difficult to crack, is whether desirability biases just won't fully materialize in laboratory studies for which money or other modest stakes are used. It is instructive to note that small monetary values were more than enough to produce wishful thinking effects when discrete outcome predictions were solicited (e.g., see Irwin, 1953; Pruitt & Hoge, 1965; Windschitl et al., 2009), so the smallness of the possible gains or losses cannot be used as a very satisfying explanation for why wishful thinking is difficult to find when likelihood judgments are solicited. However, there is no denying that real-world reasons for wanting an outcome (e.g., wanting positive news about a health test) could often have much greater impact than reasons created by monetary manipulations that researchers use in a lab setting, and there is little understanding of the different impacts these reasons might have. For example, desire for a positive outcome on a serious medical test might trigger optimism based on beliefs about the involvement of omnipotent agents (e.g., God; see related work by Kinney, Emery, Dudley, & Croyle, 2002; see also Croyle, Sun, & Hart, 1997). However, it seems unlikely that such beliefs would be triggered in a lab setting when merely money is gained or lost. Also relevant is the possible cost of being overly optimistic or pessimistic. Presumably, people's tendency to be unrealistic in their optimism or pessimism would lessen as the potential cost of such an error goes up (although there is currently little support for this from the marked card studies; see discussion in Krizan & Windschitl, 2007a). In real-world settings, there may be large asymmetric loss functions in which the cost of being overly optimistic versus overly pessimistic are quite different (see Armor et al., 2008; Harris, Corner, & Hahn, 2009; Weber, 1994; Weber & Hilton, 1990). Hence, there are complex possibilities in real-world settings, such as a case in which people are fairly motivated to be optimistic but they know that overoptimism could be deadly. Exploring the interactions of different levels or types of outcome motivations and different levels of accuracy motivations (also symmetric versus asymmetric) is a difficult yet worthwhile challenge.

A third avenue for research would be to focus on how even in the absence of static wishful thinking bias, perceptions of bias could have important and perhaps snowballing implications in complex, natural environments. In such environments, desires, knowledge, and preferences dynamically inter-relate and change in complex ways through mutual influence. For example, research

on election forecasts has shown that in addition to preferences biasing expectations (Granberg & Brent, 1983), over time expectations of the winner might also shape people's preferences and voting intentions, either because people want to get on the 'bandwagon' with the winner (e.g., Mehrabian, 1998), want to side with the 'underdog' (e.g., Ceci & Kain, 1982), or need to rationalize the existing political conditions outside of their control (e.g., Kay et al., 2002). We believe there is much to be gained from examining how preferences and expectations inter-relate in dynamic informational environments over time, and call on researchers to make use of longitudinal designs which can be useful for separating these influences as they co-occur. For example, a recent longitudinal study on preferences and expectations regarding the 2008 Presidential election reveals that, over time, preferences are more likely to shape expectations than the other way around, particularly among those highly identified with their party (Krizan, Miller, & Johar, 2009).

One feature of complex everyday environments is the iterative nature of social interactions involved. Consider financial trading markets (e.g., the New York Stock Exchange), where individuals are repeatedly required to extract complex information from others' behavior and to make forecasts based on such information. Specifically, investors' forecasts influence their investing behavior, which informs others' forecasts and behavior, and so on. In this vein, Seybert and Bloomfield (forthcoming) showed that financial incentives in trading markets can, over multiple trading rounds, lead to wishful betting (i.e., purchasing stocks for higher than warranted prices) which will eventually lead to wishful thinking (i.e., overestimating final stock value), even though initial forecasts of final stock values were unbiased. A supporting study that employed a variant of the marked card procedure further supported the idea that initially unbiased perceptions of likelihood (see earlier discussion) can become biased in the direction of desirable outcomes if people are exposed *only* to information about others' betting (Seybert & Bloomfield, forthcoming). This research provides compelling evidence for how initially unbiased likelihood judgments about stochastic outcomes (e.g., Windschitl et al., 2009) can become biased if the only information people have is others' betting behavior that tends to be biased in the direction of one's desires (e.g., Irwin & Snodgrass, 1966). These findings are a compelling demonstration of how a slight leap of faith on the part of an investor can result in substantially biased market forecasts down the line, and generally underscore the importance of investigating the complexities of how desires, knowledge, perceptions, and optimism influence each other in natural environments involving iterative interactions.

Another avenue for research should be aimed at understanding how interpersonal dynamics might influence expressions of wishful predictions. Consider that the forecasts in question don't just exist as epistemic entities; they are usually *expressed* in one way or another. In other words, people often communicate their expectations to others – students share their optimism and pessimism regarding exams they just took, athletes communicate the

expectations about their competitors' performance to their teammates, and people make forecasts about election outcomes in front of others. Given the pervasive influence of social norms and self-presentational forces on social behavior (e.g., Leary & Kowalski, 1990; Schlenker, 2003), it is quite likely that expressions of optimism are also susceptible to these influences (see Helweg-Larsen, Sadeghian, & Webb, 2002). Indeed, people might make over-optimistic time predictions of task completion time (i.e., commit the planning fallacy) in order to foster positive impression in others (Pezzo, Pezzo, & Stone, 2008), or might under-predict their performance in a competition in order to 'lull' the opponent into a false sense of security (Gibson & Sachau, 2000). Although the above findings concern outcomes involving personal control, recent findings from our laboratories show that people's performance predictions *after* completing a task (i.e., when there is no more opportunity for primary control) can be quite susceptible to inter-personal dynamics involved (Krizan, Scherr, & Windschitl, 2009). Specifically, post hoc performance forecasts seem to be a complex function of the information one's peers are expected to have regarding one's forecasts, actual performance, or both (Krizan et al., 2009). Thus, the consideration of intra-personal aspects of desirability bias (e.g., I think I will win as it makes me feel good) should also be extended to consideration of inter-personal aspects (e.g., I claim I will win in order to look good, and as a result may even feel better).

A fifth and final research avenue, which is intertwined with the others, is to target more research on the potential mediators and moderators of wishful thinking effects. We already discussed recent research that was specifically pointed at these variables (e.g., Bar-Hillel et al., 2008a, Vosgerau, forthcoming; Windschitl et al., 2009), but there is much more to be done. In our 2007 review paper, we speculated about several classes of mediators potentially relevant for understanding how preferences bias predictions (Krizan & Windschitl, 2007a). These mediating mechanisms include such processes as chronic negativity biases, biased scrutiny, focalism, and strategic considerations. They could potentially operate at three stages involved in generating forecasts (e.g., information search, evidence evaluation, and response formation). For example, desirability could bias processes early, by leading the forecaster to unduly focus on evidence for or against the desirable outcome at the expense of evidence for its alternative (e.g., Krizan & Windschitl, 2007b). Or it could cause people to repeatedly imagine the desirable alternative, having consequences for optimism (e.g., Levi & Pryor, 1987). Furthermore, desirability could actually change the way in which the individual uses or weighs evidence relevant for the forecast (e.g., by over-scrutinizing undesirable evidence; cf. Ditto & Lopez, 1992), or could influence how people translate their epistemic uncertainty into a concrete response. Although we found this speculation about possible mediators to be useful, with such numerous possibilities, further direct empirical tests are essential.

Conclusions

In conclusion, we would like to return to individuals mentioned at the start of this paper. Would the expectations of the bride and groom, the Illinois grade-schooler, the office worker, and the Texan Democrat be optimistically biased due to their respective desires? The available scientific literature provides some places to start when attempting to answer these questions. For example, perhaps people like those in our vignettes would lean in an optimistic direction if they were otherwise 'on the fence' for making a discrete prediction (e.g., Windschitl et al., 2009). Also, these people would probably be less optimistic as the time of the relevant event draws nearer (e.g., Gilovich et al., 1993; Shepperd et al., 1996). However, as we have highlighted, there are many opportunities for creating more definitive and thorough understanding of the questions of whether, when, and why desires bias optimism. We are optimistic, but hopefully not wishfully so, that researchers will pursue these opportunities.

Acknowledgements

This work was supported by grants SES 03-19243 and SES 07-20349 to the second author from the National Science Foundation. We thank Jeff Miller for his comments on the manuscript.

Short Biographies

Zlatan Krizan was born in Rijeka, Croatia, where he finished secondary education in chemical sciences. After moving to United States, he earned a Bachelor's Degree in Psychology with High Honors at Winona State University, following which he completed his doctorate work in personality and social psychology at the University of Iowa. Dr. Krizan is currently an Assistant Professor of Psychology at Iowa State University where he directs the Self and Social Perception Laboratory and coordinates the Social Area. He conducts work on social judgment, comparison, and related personality processes. His work has been published in multiple peer-reviewed journals such as *Psychological Bulletin*, *Journal of Experimental Social Psychology*, and *Journal of Research in Personality*, among others. He also serves on the editorial board of the *Journal of Personality and Social Psychology: Personality Processes and Individual Differences*.

Paul Windschitl is an Associate Professor of Psychology at the University of Iowa. His scholarly interests include social cognition and judgment and decision making. His empirical research has investigated various judgment processes and biases (including egocentrism and motivational biases), with a particular emphasis on judgments pertaining to uncertainty, such as confidence about winning competitions, social-comparative optimism about life events, subjective probabilities regarding well-defined stochastic events,

and perceived vulnerability to health threats. He holds a PhD from the Iowa State University and a BA from Creighton University.

Endnote

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