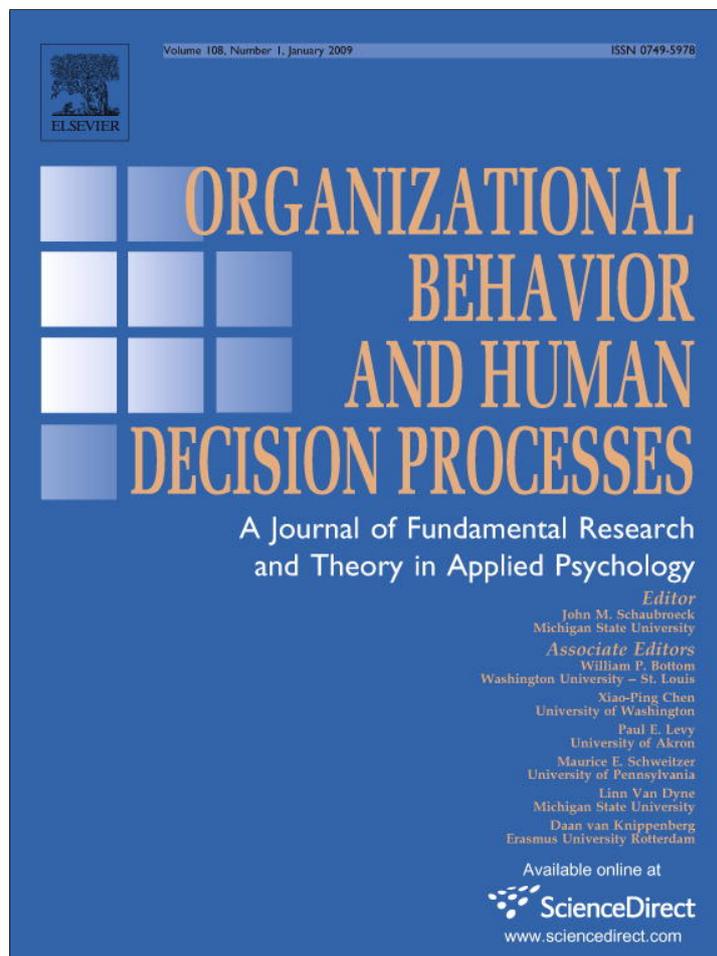


Provided for non-commercial research and education use.
Not for reproduction, distribution or commercial use.



This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

<http://www.elsevier.com/copyright>



Contents lists available at ScienceDirect

Organizational Behavior and Human Decision Processes

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

Biases in social comparisons: Optimism or pessimism? ☆

Geeta Menon^{a,1}, Ellie J. Kyung^{a,*}, Nidhi Agrawal^{b,2}^a Leonard N. Stern School of Business, New York University, 40 West Fourth Street, New York, NY 10012-1126, USA^b Kellogg School of Management, Northwestern University, 2001 Sheridan Street, Evanston, IL 60208-2001, USA

ARTICLE INFO

Article history:

Received 18 December 2006

Accepted 7 May 2008

Available online 24 June 2008

Associate editor: William Bottom

Keywords:

Optimism bias

Pessimism bias

Social comparisons

Controllability

Similarity

Comparative judgments

ABSTRACT

Social comparisons typically lead to two kinds of biases: A comparative optimism bias (i.e., a tendency for people to view themselves as more likely than others to be the beneficiaries of positive outcomes) or a comparative pessimism bias (i.e., a tendency for people to view themselves as less likely than others to be such beneficiaries); rarely are people fully calibrated in terms of how they compare to others. However, there is little systematic research on the factors that determine *when* a comparative optimism versus pessimism bias will occur, how they can be attenuated and whether such attenuation is always desirable. In this paper, we report four studies which demonstrate the following key results: First, we show that *perceived level of control* over the outcome drives whether a comparative optimism or pessimism bias will occur (Study 1). Second, an increase in *perceived similarity* between self and a comparison target person attenuates the comparative optimism bias in domains that people view as highly controllable (Study 2a) and attenuates the comparative pessimism bias in domains that people view as less controllable (Study 2b). Finally, we show that people are willing to work harder when they experience more comparative optimism in higher control scenarios and when they experience less comparative pessimism in lower control scenarios, illustrating that motivating people to strive harder for positive outcomes can result from exacerbated or attenuated bias, depending on the context (Study 3).

© 2008 Elsevier Inc. All rights reserved.

The tendency for people to be comparatively optimistic about themselves, to the point of being unrealistic, has been well-documented. People tend to believe that good things are more likely to happen to oneself relative to the average person (e.g., having a gifted child; Weinstein, 1980) and that bad things are less likely to happen to oneself relative to the average person (e.g., the likelihood of being the victim of a crime or contracting a disease; Taylor & Brown, 1988; Taylor, Lerner, Sherman, Sage, & McDowell, 2003; Weinstein, 1980). This bias has been demonstrated across a variety of judgments including susceptibility to health risk (Keller, Lipkus, & Rimer, 2002; Lin, Lin, & Raghuram, 2003; Luce & Kahn, 1999; Menon, Block, & Ramanathan, 2002; Perloff & Fetzer, 1986; Raghuram & Menon, 1998), evaluation of personal characteristics (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995; Heine & Lehman, 1997; Kruger & Dunning, 1999; Messick, Bloom, Boldizar, & Sam-

uelson, 1985; Weinstein, 1980), and odds of winning in competitive situations (Windschitl, Kruger, & Simms, 2003).

Recent research has also demonstrated a comparative pessimism bias—the tendency for people to believe that certain positive outcomes are more likely to happen for others than for themselves and that certain negative outcomes are more likely to happen for themselves than for others (Higgins, 1987; Lin et al., 2003). While understandably demonstrated in the case of depressives who tend to see themselves in a more negative light (Keller et al., 2002; Lin et al., 2003), this pessimism bias has also been demonstrated in the realms of skill assessment (Kruger, 1999), competitive situations (Windschitl et al., 2003), and games of chance (Lin, Lin, & Raghuram, 2004).

But under what circumstances does the comparative optimism versus pessimism bias occur? The literature is relatively silent on this issue and has focused on demonstrating only one of these biases at a time; that is, the evidence supports optimism bias in some situations (e.g., Weinstein, 1980) and pessimism bias in others (e.g., Keller et al., 2002), but there is little research that explicitly examines *both* biases in the same context or domain. In fact, in a review article, Dunning, Heath, and Suls (2004) highlight the importance of such research.

The focus of our paper is to determine conditions under which one might expect to observe a comparative optimism or pessimism bias with the goal of gaining a better understanding of the antecedents of such biases in social comparison. In a series of four studies, we show the following: (a) Comparative optimism is likely to occur

☆ Order of authorship is reverse-alphabetical and reflects equal contributions by each of the authors. We thank Justin Kruger for his insightful comments on an earlier version of this manuscript, Marie L. Palumbo for her editorial comments, and Andrew C. Park for his graphic assistance. We also gratefully acknowledge the constructive comments from the associate editor, Dr. William P. Bottom, and three anonymous reviewers.

* Corresponding author. Fax: +1 201 221 8155.

E-mail addresses: gmenon@stern.nyu.edu (G. Menon), ekyung@stern.nyu.edu (E.J. Kyung), nidhi-agrawal@kellogg.northwestern.edu (N. Agrawal).

¹ Fax: +1 212 995 4006.

² Fax: +1 847 491 2498.

when one perceives more control over the outcome and comparative pessimism is likely to occur when one perceives less control over the outcome; (b) Both these biases can be attenuated by increasing perceptions of similarity between oneself and a comparison target person (e.g., the average undergraduate); (c) The mechanism for these effects is a change in perception of one's own control in a domain and *not* a change in perception of another person's control; (d) Under specific conditions, people are motivated to work harder in order to attain a positive outcome, thus helping managers and educators to provide the right work environment and means to do better and succeed. We illustrate these effects while controlling for outcome valence (positive outcomes), comparison target (average undergraduate at the school), as well as event domain (kept constant in each study) unlike previous research that varies these constructs to demonstrate these biases.

We now present four studies. For each study, we present the theory that leads to the hypotheses, followed by the experimental methods and results. We conclude with a general discussion of the implications of our results for theory and practice.

Study 1: Controllability as a determinant of the comparative optimism versus pessimism bias

To develop our hypotheses related to controllability and comparative biases, we first describe past illustrations of how social comparisons result in optimism and pessimism biases.

Comparative optimism bias in social comparisons

Social comparisons often have been shown to result in a comparative optimism bias. This bias was first demonstrated by Weinstein (1980), where college students evaluated their chances of experiencing positive outcomes (e.g., liking their post-graduation job, earning a large salary, living past 80 years old, having a mentally gifted child) as greater than average, and their chances of experiencing negative outcomes (e.g., having a drinking problem, being fired, getting divorced, dropping out of college) as less than average. Weinstein (1982, 1984, 1987) then further demonstrated this effect in the negative domain of health risk perceptions (see also Perloff & Fetzer, 1986); it has since become a topic of mainstream interest in psychology (Chandran & Menon, 2004; Keller et al., 2002; Lin et al., 2003; Luce & Kahn, 1999; Menon et al., 2002; Raghuram & Menon, 1998). This optimism bias can be driven by motivational reasons such as an overall desire to feel happy (Raghuram & Menon, 1998), a need to reduce anxiety associated with uncertain outcomes (Taylor & Brown, 1988), the desire to maintain or enhance self-esteem (Weinstein, 1980), or by more non-motivated reasons such as egocentrism (Kruger, 1999), focalism (Chambers, Windschitl, & Suls, 2003; Windschitl et al., 2003), or the concreteness of the referent group used (Alicke et al., 1995; Klar, Medding, & Sarel, 1996; McConnell, Sherman, & Hamilton, 1994, 1997; see Chambers & Windschitl, 2004 for a review of non-motivated accounts). The effect is robust across a wide variety of health conditions (Perloff & Fetzer, 1986; Raghuram & Menon, 1998), mental illness (Perloff & Fetzer, 1986), and manifests regardless whether or not one has experienced a related event (Shepperd, Helweg-Larsen, & Ortega, 2003).

Comparative pessimism bias in social comparisons

Parallel to the comparative optimism bias, although empirically reported in the literature to a far lesser extent, is a comparative pessimism bias resulting in overly pessimistic views of future outcomes for the self versus others. For example, depressives are known to evaluate themselves in a more negative light due to their

lower self-esteem (Taylor & Brown, 1988). Non-depressives have also demonstrated a propensity for pessimism as well. For example, Kruger (1999) found that people can suffer from this bias in domains in which they judge their absolute skill level as low. People tend to anchor on their own inadequacy while failing to adjust for the similar inadequacy of others in areas such as telling jokes, playing chess, or juggling. Windschitl et al. (2003) found a similar effect in competitive situations such that people based their own likelihood of winning more on assessments of their own strengths and weaknesses than that of others, believing they were less likely to win when focusing on their own weaknesses.

Helweg-Larsen and Shepperd (2001) note that studies assessing comparative biases most frequently employ direct measures of comparison (e.g., ask participants to evaluate their likelihood of experiencing an event on a scale anchored at "much more likely" or "much less likely" than the average peer) because it is easier to find a bias using direct methods. Most instances documenting the pessimistic bias have used a direct comparative measure (e.g., Kruger, 1999; Windschitl et al., 2003). It remains unclear whether a pessimistic bias would emerge from indirect measures of comparative bias (e.g., compare two likelihood judgments by asking participants to estimate their likelihood of experiencing an event and the average peer's likelihood of experiencing the same event separately). In this paper, we systematically investigate the comparative pessimism bias using the less-researched indirect comparison measure.

Comparative optimism or pessimism?

What determines whether a comparative optimism or pessimism bias will manifest? The literature does not directly address this issue. Comparative optimism has been associated with perceptions of greater control such that people believe positive outcomes are more likely for themselves (vs. others) when they perceive they have more control over achieving the outcome (Harris, 1996; Weinstein, 1987; for a review see Helweg-Larsen & Shepperd, 2001; for a meta-analytic review, see Klein & Helweg-Larsen, 2002). This association is consistent with more recent findings on comparative optimism in direct comparative judgments where people perceive greater control over their outcomes in domains where their strengths are salient or they have high levels of skill (Kruger, 1999; Windschitl et al., 2003). Based on previous research, we posit that perceptions of greater control may lead to greater comparative optimism.

Although the literature related to the comparative pessimism bias has not explicitly considered the role of controllability, instances of comparative pessimism may well be associated with perceptions of lower control. For example, consider the Kruger (1999) below-average effect in cases of low absolute skill, the Taylor and Brown (1988) observation of depressives' natural tendency not to suffer from the illusion of control, and the Lin et al. (2004) finding of a pessimism bias for lotteries. In these instances, individuals may perceive lower control over the outcome (e.g., games of chance, low skill) or may be pre-disposed to doubt their ability to control their outcomes (e.g., depressives). Hence, we posit that in domains or situations where individuals perceive the outcome as less controllable, they will make pessimistic comparisons. Thus, our first hypothesis is formally stated as follows:

H1a: When an outcome is perceived as more within one's control, people will exhibit a comparative optimism bias.

H1b: When an outcome is perceived as less within one's control, people will exhibit a comparative pessimism bias.

This raises the question of whether these biases stem from differential perceptions of control attributed to oneself versus the

comparison target. There is evidence that individuals are less likely to consider that a comparison target facing the same situation might experience a similar level of control as oneself (e.g., Kruger, 1999). Such enhanced focus only on one's own level of control can lead people to overestimate their control—or lack thereof—relative to the comparison target. Thus, we hypothesize:

H2a: In situations of higher control, people believe they have more control over the situation than the comparison target.

H2b: In situations of lower control, people believe they have less control over the situation than the comparison target.

Table 1 presents a summary of the hypotheses that we test in this paper that relate to the effects of perceived controllability and perceived similarity on comparative biases. While we test H1 and H2 in this study (see the “Control – No Prime” column), we will refer back to this table as we derive the remaining hypotheses.

Methods

Seventy-four undergraduates at a large northeastern university participated in this paper-and-pencil task for partial course credit. We used the domain of getting a good grade in an important course the following semester.

Design

We used a 2 (controllability: higher vs. lower) × 2 (target person: Self vs. average undergraduate at school) within-subjects design. Each factor is explained below.

We manipulated higher and lower controllability by using the following scenario based on a pretest among students from the same population. In this pretest, 30 students rated the extent to which they believed that they had control over their grade on a seven-point semantic-differential scale anchored at “not at all within my control” and “completely in my control” when the exam was based primarily on lecture material ($M = 5.03$) versus applied material ($M = 4.42$), $t(29) = 2.92, p < .01$. Thus, we used exams based primarily on these two methods to manipulate controllability.

In the main study, we first asked students to write down the name of a course they planned to take the following semester that was important to them. We then manipulated controllability by using two variations of a scenario as follows (the underlined words below were presented as part of the scenario in the high control situation, and the italicized words below were presented as part of the scenario in the *low control situation*):

Now, think about the grade you might receive in this course. Let's assume that the grade for this course is mostly dependent on the final exam, and that this final exam is based purely on the material covered only during class lectures *<the material from class and readings as applied to the real world>*. Also assume that a list of the

topics to be covered on the exam will be handed out in class and only these topics will be covered on the final exam. In other words, if a student studies the topics on this list, then the likelihood of getting a good grade in the class is very high. *<Also assume that no specified list of topics for the exam will be distributed in class. In other words, if a student keeps up with real-world events and is able to apply class material to these real-world events, then the likelihood of getting a good grade in the class is very high.>*

The number of words was the same in both experimental conditions. We manipulated this variable within-subjects with reference to the same “important” course participants listed and counterbalanced the order in which the two scenarios were presented. Since the order did not make a difference, we did not include it in further analyses. We manipulated the second factor, target person, by eliciting judgments for the self and the average undergraduate at the school.

Procedure

Participants were told that this study was being conducted to understand how undergraduate students think about themselves and other students at <the school name> in the context of course work. They were then asked to write down the name of a course important to them that they would be taking the following semester and the controllability manipulation described above was implemented with regard to this course. Participants were then asked, “If the grading structure for the course is described as above, how likely is it that **you** will get a good grade in this course?” elicited on a seven-point semantic-differential scale anchored at “Very unlikely to get a good grade” and “Very likely to get a good grade”. They were then asked how likely they thought the average undergraduate at the <school name> was to get a good grade in the same course on the same seven-point likelihood scale. Participants then rated how controllable getting a good grade in the course was if the exam were based (a) completely on the material covered in class, and (b) completely on the material applied to the real world, first for themselves, and then for the average undergraduate at the school; these ratings were elicited using seven-point semantic-differential scales anchored at “Not at all within my <their> control” and “Very much within my <their> control.” Finally, participants provided background information on their gender and age, then were debriefed and dismissed. The results did not vary by any of these background variables and are not discussed further. The questionnaire took less than 15 min to complete.

Results

Manipulation check

In order to ensure that the controllability manipulation worked as intended, we conducted a one-way repeated-measures ANOVA on participants' level of control over getting a good grade in the class when the exam was based on lectures versus applied mate-

Table 1
Summary of research hypotheses and studies

		Perceived similarity between self and comparison target		
		Control–No prime	Dissimilarity primed	Similarity primed
<i>When does the comparative optimism versus pessimism bias manifest? (Studies 1, 2a and 2b)</i>				
Perceived controllability in the domain	Higher	• Optimism (H1a)	• Optimism (H3)	• Optimism attenuated (H3)
	Lower	• Pessimism (H1b)	• Pessimism (H3)	• Pessimism attenuated (H3)
<i>What happens to perceptions of control for self? (Studies 1 and 3)</i>				
Perceived controllability in the domain	Higher	• Enhanced (H2a)	• Enhanced (H4a)	• Dampened (H4a)
	Lower	• Dampened (H2b)	• Dampened (H4b)	• Enhanced (H4b)
<i>What happens to behavioral intentions to attain positive outcome? (Study 3)</i>				
Perceived controllability in the domain	Higher	• No predictions tested	• Enhanced (H5a)	• Dampened (H5a)
	Lower		• Dampened (H5b)	• Enhanced (H5b)

rial. This analysis indicated a main effect of controllability, $F(1,73) = 45.92, p < .01$, confirming the results from the pretest that receiving a good grade on an exam based on lectures ($M = 6.15$) is perceived as more controllable than one based on applied material ($M = 4.57$).

Likelihood of getting a good grade in a course (H1)

A 2 (controllability: lower vs. higher) \times 2 (target person: self vs. average undergraduate at school) repeated-measures MANOVA on the likelihood of getting a good grade in the course revealed a significant two-way interaction, $F(1,73) = 17.22, p < .01$, and a main effect of controllability, $F(1,73) = 45.17, p < .01$. The pattern of means is presented graphically in the top panel of Fig. 1.

In order to test H1, we conducted planned contrasts between target persons within each level of control. When getting a good grade is perceived as lower control (i.e., exam based on applied material), the self is perceived as having a lower likelihood of getting a good grade ($M = 4.57$) than the average undergraduate ($M = 5.07$), $F(1,73) = 4.09, p < .05$. When getting a good grade is perceived as higher control (i.e., exam is based on lectures), the self is perceived as having a higher likelihood of getting a good grade ($M = 6.15$) than the average undergraduate ($M = 5.36$), $F(1,73) = 16.07, p < .01$.

Note that the movement in likelihoods is significant for the self when the domain is lower control ($M = 4.57$) versus higher control ($M = 6.15$), $F(1,73) = 41.94, p < .01$, compared to the average undergraduate where the difference is significant only at $p = .08$, albeit in the same direction ($M = 5.07$ vs. 5.36), $F(1,73) = 3.24$. Therefore, perceived outcome controllability affects likelihood estimates for self more than for the average undergraduate.

Perceptions of controllability (H2)

We conducted a 2 (controllability: lower vs. higher) \times 2 (target person: self vs. average undergraduate at school) repeated-measures MANOVA on the perceptions of controllability of getting a good grade in the course that revealed a significant two-way interaction, $F(1,73) = 15.67, p < .01$, and a main effect of controllability, $F(1,73) = 28.22, p < .01$. The pattern of means is presented graphically in the bottom panel of Fig. 1 and reflects the same pattern as the likelihood means on the top panel. When getting a good grade is perceived as lower control (i.e., exam based on applied material), the self is perceived as having less control over getting a good grade ($M = 4.78$) than the average undergraduate ($M = 5.20$), $F(1,73) = 7.07, p < .01$. When getting a good grade is perceived as higher control (i.e., exam is based on lectures), the self is perceived as having a more control over getting a good grade ($M = 6.15$) than the average undergraduate ($M = 5.73$), $F(1,73) = 7.52, p < .01$. These results support H2. Note, again, that the movement in perception of control is steeper for the self in lower ($M = 4.78$) versus higher control domains ($M = 6.15$; $F(1,73) = 45.92, p < .01$) than for the average undergraduate ($M = 5.73$ vs. 5.20 ; $F(1,73) = 6.14, p < .05$), though both pairs of differences are statistically significant.

Discussion

The results of this study provide direct evidence that the occurrence of comparative optimism versus pessimism depends on the level of perceived control over outcomes. We also demonstrated that perception of the average undergraduate's control changed

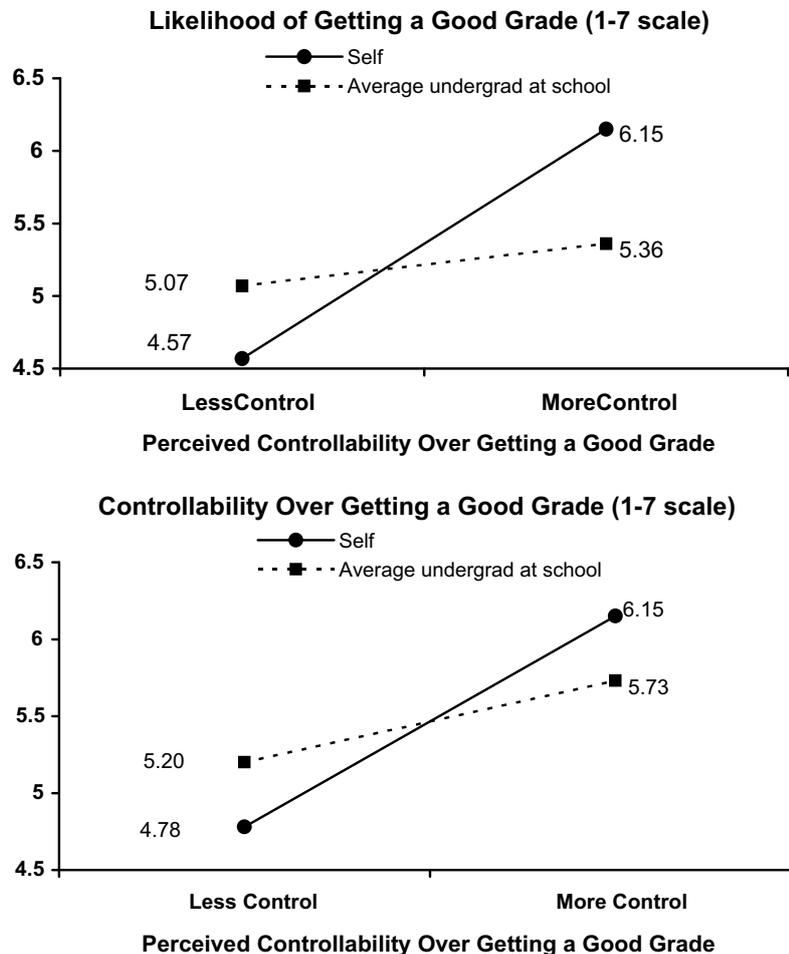


Fig. 1. Study 1: Comparative optimism versus pessimism as a function of outcome controllability.

less as a function of the type of exam than perception of one's own control. These data provide evidence that the locus of movement for perceptions of control originates from the self rather than the other person.

Having established that controllability is a determinant of whether a comparative optimism or pessimism bias occurs, we next address how to attenuate these biases.

Study 2: The attenuating effect of perceived similarity between comparison targets

Since optimism and pessimism biases involve a comparison of oneself with a target other, these biases should be a function of how similar people view themselves relative to the comparison target. There is evidence that greater perceived similarity results in more modest and realistic self-assessments when making self-presentations (Tice, Butler, Muraven, & Stillwell, 1995), taking the blame for failures (Sedikides, Campbell, Reeder, & Elliot, 1998), or making judgments of health risk (Chandran & Menon, 2004; Harris & Middleton, 1994; Klein & Weinstein, 1997; Perloff & Fetzer, 1986).

There are two reasons why perceived similarity between oneself and a comparison target should attenuate social comparison biases. First, the motivational processes that apply to the self (e.g., the need to see oneself as more likely to be the beneficiary of a positive outcome than someone else) are also likely to apply to a similar (vs. different) comparison target; this would lead people to have similar judgments for closer others and the self (Menon, Raghuram, & Schwarz, 1995). On the other hand, such motivational reasons do not hold for comparison targets that are perceived as substantially different from the self. Second, the literature on social comparisons suggests that whereas similarity-based comparisons lead to assimilations, difference-based comparisons lead to contrast effects (Mussweiler, 2003). Therefore, when the comparison target is similar, estimates of the self and the comparison target should assimilate and reduce both optimism and pessimism biases.

In the light of the two reasons above, perceived similarity between the self and the comparison target should moderate the extent of both optimism and pessimism biases such that the biases are reduced when people believe that the other person is more like them. Although perceived similarity has been indirectly examined in illustrations of comparative optimism, its role in reducing comparative pessimism has not.

H3: Perceived similarity between oneself and the comparison target will moderate optimism and pessimism biases such that the biases are attenuated when perceptions of similarity are higher.

Table 1 presents a summary of H3. We now report the results of two studies with the goal of testing H3; one study is set in a domain in which perceptions of control over the outcome are higher (Study 2a) and the other in a domain in which perceptions of control over the outcome are lower (Study 2b).

Pretest

In order to choose two domains that reflect situations in which participants felt that they had lower and higher levels of control over the outcome, we ran a pretest among 38 students from the same population that was used in the main studies. In this pretest, we asked participants to rate different outcomes (e.g., winning a raffle, doing well in a trivia competition on pop culture, among others) on the extent to which the participants could control the outcome on a seven-point scale anchored at "Not at all within

my control" and "Very much within my control." We chose two domains that reflected positive outcomes (i.e., the outcome was desirable) that varied on controllability: Doing well in a trivia competition based on popular culture ($M = 4.97$) and winning a raffle ($M = 1.45$), $F(1,37) = 165.76$, $p < .01$.

Study 2a: Comparative optimism in a higher-control scenario

Methods

Thirty-eight undergraduates at a large northeastern university participated in this paper-and-pencil study for partial course credit. The study was in the domain of winning a trivia competition based on popular culture being conducted by the undergraduate college at the school.

Design. We used a 3 (prime similarities vs. prime differences between self and average undergraduate at school vs. no prime) \times 2 (target person: self vs. average undergraduate at the school) mixed-factorial design, with the first factor manipulated between-subjects and the second within-subjects.

Procedure. Participants were told that this study was being conducted to understand how undergraduate students think about themselves and other students at their school. Two of the three experimental (i.e., the "prime") conditions were then asked to write down "TWO ways in which you are similar <different> compared to the average undergraduate student at <school name>." This manipulation was intended to vary perceptions of similarity between self and the average undergraduate such that when similarities were primed, the self would be seen as more similar to the average undergraduate, and when differences were primed, the self would be seen as less similar (Chartrand & Bargh, 2002). The third experimental condition (i.e., the "no prime" condition) was not given this task.

Then all participants were told, "Suppose <school name> were to conduct a trivia contest on popular culture" and asked "How likely do you think you are to do well in this trivia contest?" followed by "How likely do you think an average undergraduate at the <school name> is to do well in this trivia contest?" Both were elicited on seven-point "likelihood of winning" semantic-differential scales anchored at "Not at all likely" and "Very likely." They then rated the controllability of winning the contest by answering the following question: "How much within your control is your doing well in the trivia contest?" elicited using a seven-point semantic-differential scale anchored at "Not at all within my control" and "Very much within my control."

All participants then rated how similar the average undergraduate was to them on a seven-point scale anchored at "Not at all similar" and "Very similar." To rule out the possibility that the effects observed were due to differential difficulty associated with retrieving similarities or differences between self and the average undergraduate (which could create a confound), in the "prime" conditions, participants then rated how easy or difficult it was to list two similarities/differences between self and the average undergraduate on a seven-point scale anchored at "Easy" and "Difficult." Finally, participants provided background information on their gender and age. These variables did not affect our primary measures and are not discussed further. Participants were then debriefed and dismissed. The questionnaire took less than 10 min to complete.

Results

Manipulation and confound checks. In order to ascertain that our similarity manipulation worked as intended, we conducted a one-way ANOVA on the extent to which participants perceived

the average undergraduate as being similar to them. This ANOVA revealed a significant main effect of prime, $F(2, 35) = 5.71, p < .01$, such that the self and the average undergraduate were perceived as less similar in the prime differences condition ($M = 3.62$) than in the prime similarities condition ($M = 5.25$), contrast $t = 3.25, p < .01$. Therefore, our priming conditions worked as intended. While the difference between the control condition ($M = 4.00$) and the prime difference condition was not significant, p 's $> .20$, the difference between the control and the prime similarities condition was, contrast $t = 2.48, p < .05$.

We conducted a one-way ANOVA (prime similarities versus differences) on the measure that asked how easy or difficult the task was. This analysis confirmed that thinking of two similarities ($M = 4.08$) was as difficult or easy as thinking of two differences ($M = 4.62$), $F < 1.0$, thus eliminating recall difficulty as an alternate explanation to our results.

Likelihood of doing well in the trivia competition (H3). We conducted a 3 (prime: similarities vs. differences vs. no prime) \times 2 (target person: self vs. average undergraduate at school) repeated-measures ANOVA on the seven-point "likelihood of doing well" measure. The cell means are presented graphically in the top panel of Fig. 2.

This analysis revealed a significant interaction of the prime and target person, $F(2, 35) = 3.91, p < .05$, and a significant main effect of the target person, $F(1, 35) = 15.91, p < .01$. Planned contrasts

indicated that the perceived likelihood of oneself doing well in the trivia competition compared to the average undergraduate was significantly different when differences between self and the average undergraduate were primed ($M_{\text{self}} = 5.69; M_{\text{avg-undergrad}} = 3.54$), contrast $F(1, 35) = 17.35, p < .01$, and in the no prime condition ($M_{\text{self}} = 5.38; M_{\text{avg-undergrad}} = 4.00$), contrast $F(1, 35) = 7.17, p < .01$, but not when similarities were primed ($M_{\text{self}} = 4.33; M_{\text{avg-undergrad}} = 4.25$), contrast $F < 1.0$. These results support H3 such that the comparative optimism bias observed in the prime differences and control conditions is attenuated when perceptions of similarity between self and the average undergraduate are enhanced by priming similarities.

Potential process—perceived controllability over the outcome. Why is it that people believe they are more likely to win a pop-culture trivia competition when they perceive greater differences between themselves and the average undergraduate? One explanation is that when differences between the self and average undergraduate are primed in this higher control domain, people perceive themselves as having more control over the situation than the average undergraduate. In contrast, when similarities are primed, people are likely to conclude that the level of control they have is not very different from that of a comparison target.

In this study, we elicited participants' perceptions of control over their doing well in the trivia competition on a seven-point

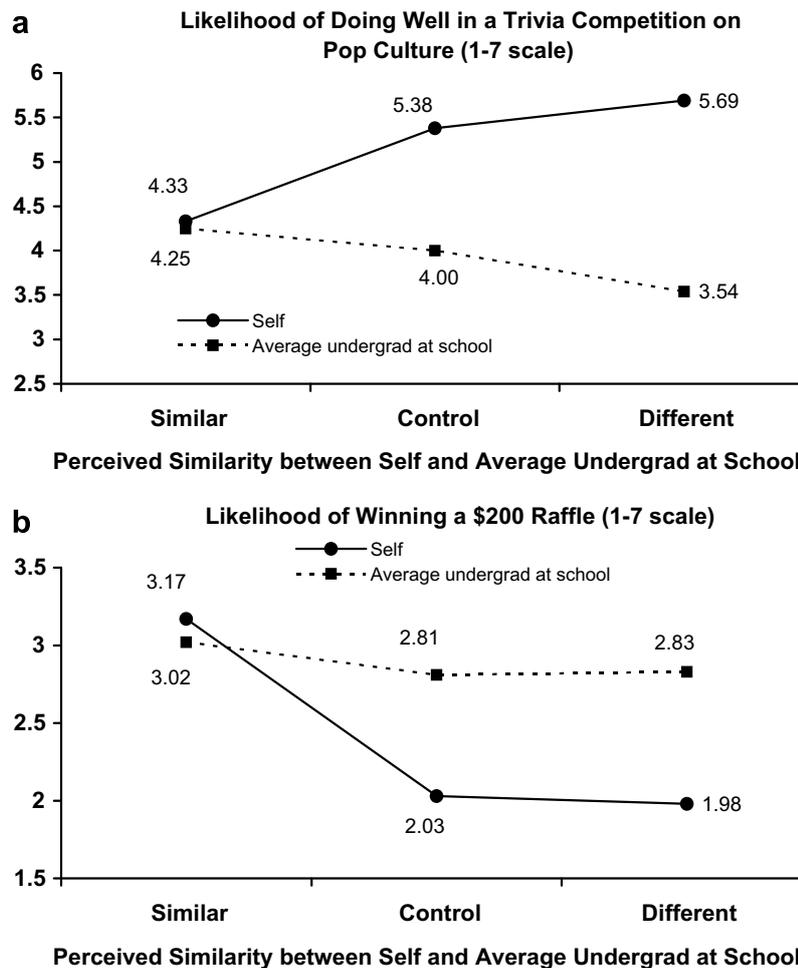


Fig. 2. Study 2: (a) Priming similarities attenuates comparative optimism in a higher-control scenario. (b) Priming similarities attenuates comparative pessimism in a lower-control scenario.

scale, with a higher number reflecting higher levels of control; note that because participants believe they have higher control in this domain, we expect that perceptions of control would be higher in the prime differences and no-prime conditions compared to the prime similarities condition. A one-way three-level ANOVA obtained a main effect of the prime, $F(2,35) = 4.99$, $p < .05$, such that priming similarities ($M = 3.75$) led to significantly lower perceptions of control than priming differences ($M = 4.85$), contrast $t = 1.78$, $p < .05$, and the no-prime condition ($M = 5.69$), contrast $t = 3.16$, $p < .01$. The prime differences and no-prime conditions were not significantly different from each other, $p > .10$.

These data provide initial support for perceived controllability over the outcome as the mechanism by which judgments about the likelihood of positive outcomes are affected.

Study 2b: Comparative pessimism in a low-control scenario

Methods

One hundred and seventeen undergraduates at a large northeastern university participated in this paper-and-pencil study for partial course credit. The study was conducted in the domain of winning a \$200 raffle being conducted by the undergraduate college at the school, pretested as a domain in which the participants felt that the outcome was not really within their control.

Design. Identical to Study 2a, we used a 3 (prime to manipulate similarity: similarities vs. differences between self and average undergrad at school vs. no prime) \times 2 (target person: self vs. average undergraduate at the school) mixed-factorial design, with the first factor manipulated between-subjects and the second within-subjects.

Procedure. The experimental procedure was identical to Study 2a and the main dependent measure was elicited by asking participants, "Suppose you were to participate in a raffle being conducted by the <school name> undergraduate school. The ticket costs \$1 and the winner gets \$200." They were asked "How likely do you think you are you to win the \$200?" and then they were asked "How likely do you think an average undergraduate at the <school name> is to win the \$200?" both elicited on the seven-point "likelihood of winning" semantic-differential scale. They then rated the controllability of winning the raffle on a seven-point scale as before.

This was followed by ratings of how easy or difficult it was to list two similarities or differences between self and the average undergraduate, how similar the average undergraduate was to them, and background information on whether they had ever bought a raffle ticket, whether they had ever won a raffle, their gender and age. These variables did not affect our primary measures and are not discussed further. Participants were then debriefed and dismissed. The questionnaire took less than 10 min to complete.

Results

Manipulation check. In order to ascertain that our similarity manipulation worked as intended, we conducted a one-way ANOVA on the extent to which participants perceived the average undergraduate as similar to themselves which revealed a significant main effect of prime, $F(2,113) = 3.22$, $p < .05$, such that the self and the average undergraduate were perceived as less similar in the prime differences condition ($M = 3.05$) than in the prime similarities condition ($M = 4.00$), contrast $t = 2.45$, $p < .05$. Therefore, our priming conditions worked as intended. The differences between the control condition ($M = 3.28$) and the two prime conditions were not significant, p 's $> .10$.

Likelihood of winning the \$200 raffle (H3). We conducted a 3 (prime: similarities vs. differences vs. no prime) \times 2 (target person: self vs. average undergraduate at school) repeated-measures ANOVA on the likelihood of winning the \$200 raffle. The cell means are presented graphically in the bottom panel of Fig. 2.

This analysis revealed a significant interaction of the prime and target person $F(2,112) = 5.09$, $p < .05$, and a significant main effect of the target person, $F(1,112) = 11.44$, $p < .01$. Planned contrasts indicated that the perceived likelihood of oneself winning the raffle compared to the average undergraduate was significantly lower when differences between self and the average undergraduate were primed ($M_{\text{self}} = 1.98$; $M_{\text{avg-undergrad}} = 2.83$), contrast $F(1,112) = 12.05$, $p < .01$ and in the no prime condition ($M_{\text{self}} = 2.03$; $M_{\text{avg-undergrad}} = 2.81$), contrast $F(1,112) = 8.11$, $p < .01$. When similarities were primed this difference was not significant ($M_{\text{self}} = 3.17$; $M_{\text{avg-undergrad}} = 3.02$), contrast $F < 1.0$. These results support H3 such that the pessimism bias observed in the prime differences and control conditions is attenuated when perceptions of similarity between self and the average undergraduate are enhanced by priming similarities (vs. differences).

Potential process—perceived controllability over the outcome. As in Study 2a, a one-way three-level ANOVA obtained a main effect of the prime significant at $p < .01$, $F(2,115) = 6.17$, such that priming similarities ($M = 2.67$) led to perceptions of greater outcome controllability than priming differences ($M = 1.50$), contrast $t = 3.43$, $p < .01$, and the no-prime condition ($M = 1.84$), contrast $t = 2.25$, $p < .05$. The prime differences and no-prime conditions were not significantly different from each other, $p > .05$. Note that the means are on the low end of the seven-point scale suggesting floor effects, confirming that raffle/lottery domain is perceived overall as a less controllable one (see also Lin et al., 2004).

Discussion

The results of Studies 2a and 2b establish that perceived similarity between self and other is an important variable to consider for cases of both comparative optimism and pessimism in the domain of attaining positive outcomes. Previous studies have demonstrated the role of perceived similarity by manipulating group membership (e.g., comparison target is an in-group member vs. out-group member) and the intimacy of relationship (e.g., comparison target is a best friend or an average peer). Unlike these studies, we manipulated perceptions of the *same* comparison target as similar or different through a prime and established that a *perception* of enhanced similarity, and not simply a comparison target with which one has more similarity (e.g., a close friend versus an acquaintance or an average person), leads to the observed effects.

Study 3: Interactive effects of perceived controllability and similarity on comparative biases

Study 1 manipulated perceived level of control, demonstrating that when people feel an outcome is more controllable, a comparative optimism bias is more likely to manifest, and when they feel an outcome is less controllable, a comparative pessimism bias is more likely to manifest. In Study 2 we examined the role of similarity in attenuating both of these biases. In this study, we examine the interactive roles of perceived similarity and perceived controllability on participants' judgments of the likelihood of positive outcomes, therefore testing the hypotheses presented in the four cells in the middle panel of rows of Table 1.

We first replicate the results from Study 1—that is, when an outcome is perceived as within their control, people exhibit a comparative optimism bias and when an outcome is perceived as less within their control (H1a), people exhibit a comparative pessimism

bias (H1b). We then replicate the results of Study 2—when perceived similarity between self and other are varied, both comparative biases are attenuated and perceptions of control change systematically (H3). Furthermore, we expand our theorizing and explicitly examine the extent to which a belief in a differential level of control for oneself versus others drives this bias—versus simply the controllability of the event at large—and whether this differential level of control also interacts with similarity. We derive these hypotheses based on past research as well as on the findings of our earlier studies.

In Study 2, we found that enhancing similarity leads to perceptions of greater control, with perceptions of the self tending to vary more as a function of the interventions than perceptions related to the comparison target. Hence, in low control situations, similarity should lead people to believe they have less control over a situation than others do, and in high control situations, dissimilarity should lead to people to believe they have more control over the situation than others do. These predictions are supported by *Mussweiler (2003)*, *Mussweiler & Bodenhausen, 2002*), who suggests that focusing on similarities between self and the comparison target leads to assimilation towards the comparison target, while focusing on differences leads to contrast away from the comparison target.

Thus, we expect to observe these assimilation effects in perceived controllability when perceived similarity is greater and contrasts effects when perceived dissimilarity is greater (see middle panel of *Table 1*). Specifically,

H4a: In situations of *higher* control, people believe they have *more* control than others when they perceive *less* similarity between self and the comparison target.

H4b: In situations of *lower* control, people believe they have *less* control than others when they perceive *less* similarity between self and the comparison target.

As noted earlier, previous research suggests that people tend to focus on their own abilities or inabilities when forming comparative judgments (*Kruger, 1999*). Indeed, we found in Study 1 that manipulating outcome controllability had a greater effect on perceptions of controllability for the self rather than the average undergraduate. This suggests that changes in domain or task controllability should influence comparative likelihood judgments through changes in perceptions of control for the self, rather than the other.

H4c: Perceived controllability for the self over an outcome mediates the effects of similarity and outcome controllability on comparative judgments.

In Study 3, we also expand the web of dependent measures to include behavioral intent. We ask the following question: Given that the comparative optimism and pessimism biases manifest as a function of perceived controllability over the outcome and similarity to a comparison target, when are people more likely to be motivated to take steps to attain a positive outcome? Comparative optimism has been shown to have both positive and negative effects with respect to behavioral intentions depending on the valence of the outcome. For instance, in the health domain, while one stream of research argues that comparative optimism leads to lower motivation to act if there is a chance of a negative outcome (*Fishbein & Ajzen, 1975*), another stream of research argues that comparative optimism leads to greater motivation to act if there is a chance of a positive outcome (e.g., *Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000*).

Since we are focusing on positive outcomes in this paper, we build on this latter stream of research and propose that a greater

likelihood of attaining positive outcomes will prompt people to form intentions and take actions. Hence, when people perceive greater control over a positive outcome, greater perceived similarity with others will lead to a belief of a lower likelihood of attaining that outcome, and thus lower intention to act. In contrast, when people feel they have less control over an outcome, they are much less likely to take action (*Taylor et al., 2000*). Therefore, in a low control domain, dissimilarity leads to greater pessimism and thus should yield lower behavioral intentions to attain a positive outcome. On the other hand, similarity leads to perceptions of higher control and attenuates pessimism (as demonstrated in Studies 1 and 2b), and should lead to greater behavioral intentions. These predictions are depicted in the bottom panel of rows of *Table 1*. Stated formally, perceived similarity moderates the effects of perceived outcome controllability on behavioral intentions such that:

H5a: When an outcome is perceived as *more* within one's control, greater similarity between self and the comparison target will lead to *lower* behavioral intentions.

H5b: When an outcome is perceived as *less* within one's control, greater similarity between self and the comparison target will lead to *higher* behavioral intentions.

Methods

Ninety-seven undergraduates at a large northeastern university participated in this paper-and-pencil task for partial course credit; missing data from five participants yielded 92 completed questionnaires. We used the domain from Study 1 of getting a good grade in an important course in the near future.

Design

We used a 2 (perceived similarity between self and average undergrad at school: more vs. less) \times 2 (controllability: higher vs. lower) \times 2 (target person: self vs. average undergrad at school) mixed-factorial design, with the first two factors manipulated between-subjects and the third within-subjects. In order to manipulate perceived similarity between self and the average undergraduate student, we employed the manipulation used in Studies 2a and 2b. That is, participants were asked to write down "Two ways in which you are similar <different> compared to the average undergraduate student at <school name>." We manipulated higher and lower controllability by using the same exam scenario described in Study 1. However, this time, we manipulated controllability between-subjects so that participants were presented with either the higher control (lecture material-based final exam) or the lower control (applied material-based final exam) scenarios. We manipulated the third factor, target person, within-subjects by using self and the average-undergraduate similar to Studies 1, 2a and 2b.

Procedure

The procedures employed and measures collected were identical to those of Study 1 with the following exceptions. After implementing the similarity and controllability manipulations and collecting participant measures of their own versus the average undergraduate's likelihood of getting a good grade in the class, we collected behavioral intention measures along several dimensions. Participants' intentions to take steps to get a better grade in this course were measured through: (a) how much effort they intended to put into this course and how motivated they were to work hard, both elicited on seven-point semantic-differential scales with higher numbers indicating more effort and motivation ($\alpha = .89$); (b) how often they intended to visit the Professor and the

TA during the office hours, both elicited on seven-point semantic-differential scales anchored at “never” and “frequently” ($\alpha = .89$); and (c) an open-ended question on how many hours in an average week they intended to spend preparing for this class.

As in Study 1, we included measures of perceived controllability over getting a good grade given the grading schemes, the perceived distance between self and the comparison target, and background questions pertaining to gender and age. Participants were then debriefed and dismissed. Since the results did not vary by any of these background variables, they are not discussed any further. The entire questionnaire took less than 10 min to complete.

Results

Manipulation checks

A 2 (perceived similarity: more vs. less) \times 2 (controllability: lower vs. higher) ANOVA on perceived similarity between self and the average undergraduate confirmed a main effect of the similarity ($F(1,91) = 4.18, p < .05$), indicating that the self and the average undergraduate were perceived as more similar when participants were asked to recall two similarities ($M = 4.02$) than two differences ($M = 3.34$). No other effect was significant.

Likelihood of Getting a Good Grade in the Course (H1 and H3)

A 2 (perceived similarity: more vs. less) \times 2 (controllability: lower vs. higher) \times 2 (target person: self vs. average undergraduate

at school) repeated-measures MANOVA on the likelihood of getting a good grade revealed the predicted three-way interaction, $F(1,88) = 7.16, p < .01$, and a main effect of controllability, $F(1,88) = 23.56, p < .01$; see Fig. 3 for a graphic presentation of the means. When getting a good grade is perceived as higher control (i.e., the exam is based on lecture material; top panel of Fig. 3), the more different the self and the average undergraduate seem (i.e., recall two differences condition), the greater the comparative optimism bias observed ($M_{\text{self}} = 6.39$ vs. $M_{\text{avg-undergraduate}} = 5.65$), contrast $F(1,22) = 6.84, p < .05$. When they are perceived as similar (i.e., recall two similarities condition), the comparative optimism bias is attenuated ($M_{\text{self}} = 5.92$ vs. $M_{\text{avg-undergraduate}} = 6.08$), $F < 1$. These results reverse when getting a good grade is perceived as lower control (i.e., exam is based on applied material; bottom panel of Fig. 3). When the self and the average undergraduate are perceived as different (i.e., recall two differences condition), the pessimism bias manifests in the likelihood of getting a good grade ($M_{\text{self}} = 4.75$ vs. $M_{\text{avg-undergraduate}} = 5.42$), contrast $F(1,23) = 3.34, p < .05$, one-tailed. When they are perceived as similar (i.e., recall two similarities condition), the pessimism bias is attenuated ($M_{\text{self}} = 5.43$ vs. $M_{\text{avg-undergraduate}} = 5.19$), contrast $F < 1$.

Perceived controllability of getting a good grade (H4)

A 2 (perceived similarity: more vs. less) \times 2 (controllability: lower vs. higher) \times 2 (target person: self vs. average undergraduate at school) repeated-measures MANOVA on perceived controllabil-

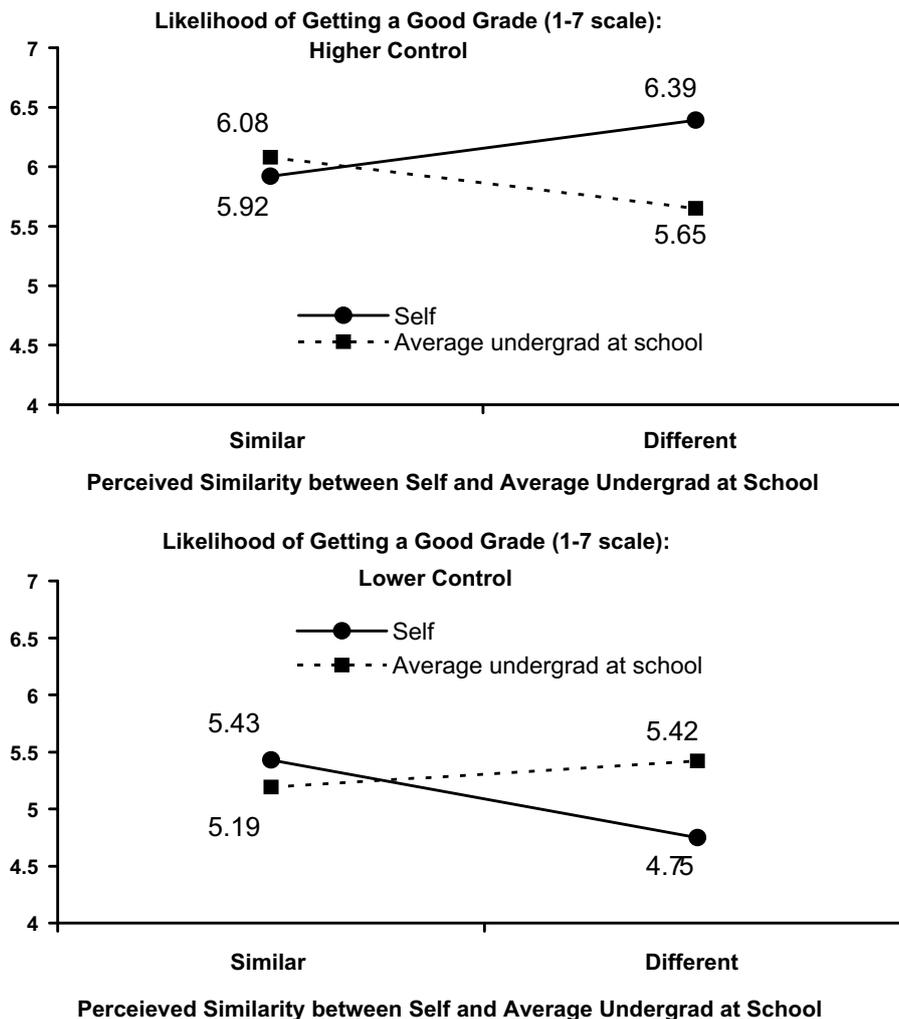


Fig. 3. Study 3: Interactive effects of controllability and similarity on the nature and extent of comparative biases.

ity of getting a good grade in the course revealed a main effect of controllability, $F(1,88) = 7.41, p < .01$, confirming the efficacy of our manipulation of controllability using grading schemes ($M_{high} = 6.14$ vs. $M_{low} = 5.50$). We also found a significant two-way interaction of controllability and target person, $F(1,88) = 7.53, p < .01$, and most importantly, a three-way interaction significant at $p = .07, F(1,88) = 3.39$. The pattern of means for self versus the average undergraduate is presented in Fig. 4.

When getting a good grade is perceived as a higher control domain (i.e., the exam is based on lecture material; top panel of Fig. 4), and when differences are enhanced (i.e., recall two differences condition), the comparative optimism bias is observed ($M_{self} = 6.52$ vs. $M_{avg-undergraduate} = 5.91$), contrast $F(1,22) = 3.15, p < .05$, one-tailed. With higher perceived similarity (i.e., recall two similarities condition), the comparative optimism bias is attenuated ($M_{self} = 6.13$ vs. $M_{avg-undergraduate} = 6.00$), contrast $F(1,23) = 1.86; p = .19$. These results reverse when getting a good grade is perceived as a lower control domain (i.e., exam is based on applied material; bottom panel of Fig. 4). When the self and the average undergraduate are perceived as different (i.e., recall two differences condition), the pessimism bias in perceived controllability manifests ($M_{self} = 5.08$ vs. $M_{avg-undergraduate} = 5.83$), contrast $F(1,23) = 5.49, p < .05$. When they are perceived as similar (i.e., recall two similarities condition), the pessimism bias is

attenuated ($M_{self} = 5.48$ vs. $M_{avg-undergraduate} = 5.62$), contrast $F < 1$. These data suggest that perceptions of outcome controllability for the self, rather than for the other, varied across conditions.

Mediation analyses (H4c)

We predict that perceptions of the self's ability to control the outcome mediates both of the comparative biases in likelihood judgments of getting a good grade. Following the procedures recommended by Baron and Kenny (1986), we ran three sets of analyses to test for this mediation. First, as mentioned previously, the 2 (perceived similarity: more vs. less) \times 2 (controllability: lower vs. higher) \times 2 (target person: self vs. average undergraduate at school) repeated-measures MANOVA on the likelihood of getting a good grade in the course revealed the significant three-way interaction, $F(1,88) = 7.16, p < .01$. Second, a 2 (controllability) \times 2 (perceived similarity) ANOVA on the proposed mediator (perception of the self's control over the outcome) that revealed a significant two-way interaction, $F(1,80) = 4.07, p < .05$. Finally, when the proposed mediator (perceptions of the self's control over the outcome) was added as a covariate to the first analysis as an ANCOVA, the interaction between the mediator and the target person was significant, $F(1,80) = 16.02, p < .001$, and the magnitude of three-way interaction between the controllability, perceived similarity, and target person was reduced, $F(1,80) = 3.94, p = .05$; Sobel test: $t = 1.80$, sig-

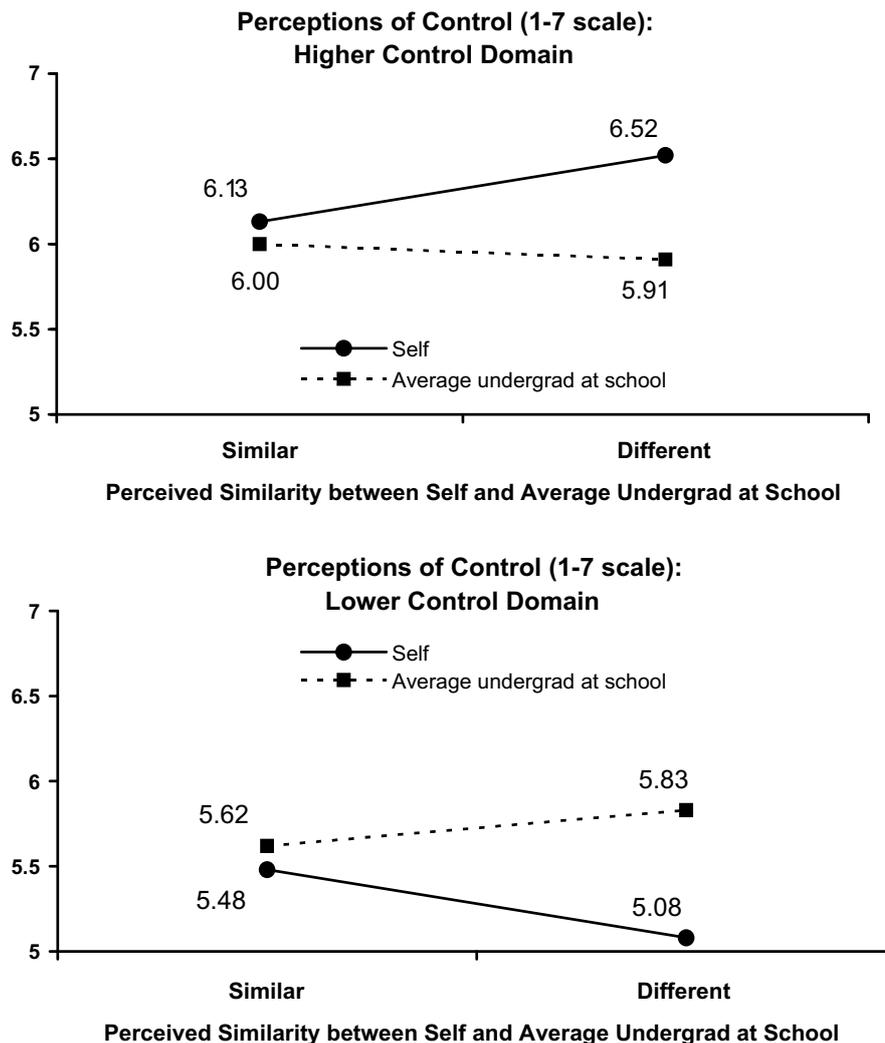


Fig. 4. Study 3: Interactive effects of controllability and similarity on perceptions of control over the outcome.

nificant at $p < .07$. These analyses provide directional support for the hypothesis that the effects of similarity and outcome controllability influence perceived controllability for the self over an outcome, which in turn influences whether a comparative optimism versus pessimism bias occurs, and its extent.

Behavioral intentions (H5)

A 2 (perceived similarity: more vs. less) \times 2 (controllability: lower vs. higher) \times 2 (target person: self vs. average undergraduate

at school) repeated-measures MANOVA across the three dependent measures revealed the predicted significant interaction, $F(4,85) = 4.12, p < .01$. Multivariate contrasts across the three measures indicate that when the domain is perceived as more controllable (i.e., a lecture-based exam), behavioral intentions are higher when perceived dissimilarity is high, contrast $F(4,86) = 2.08, p < .05$, one-tailed. When the domain is perceived as less controllable (i.e., exam based on applied material), these results reverse and behavioral intentions are higher when perceived similarity is high,

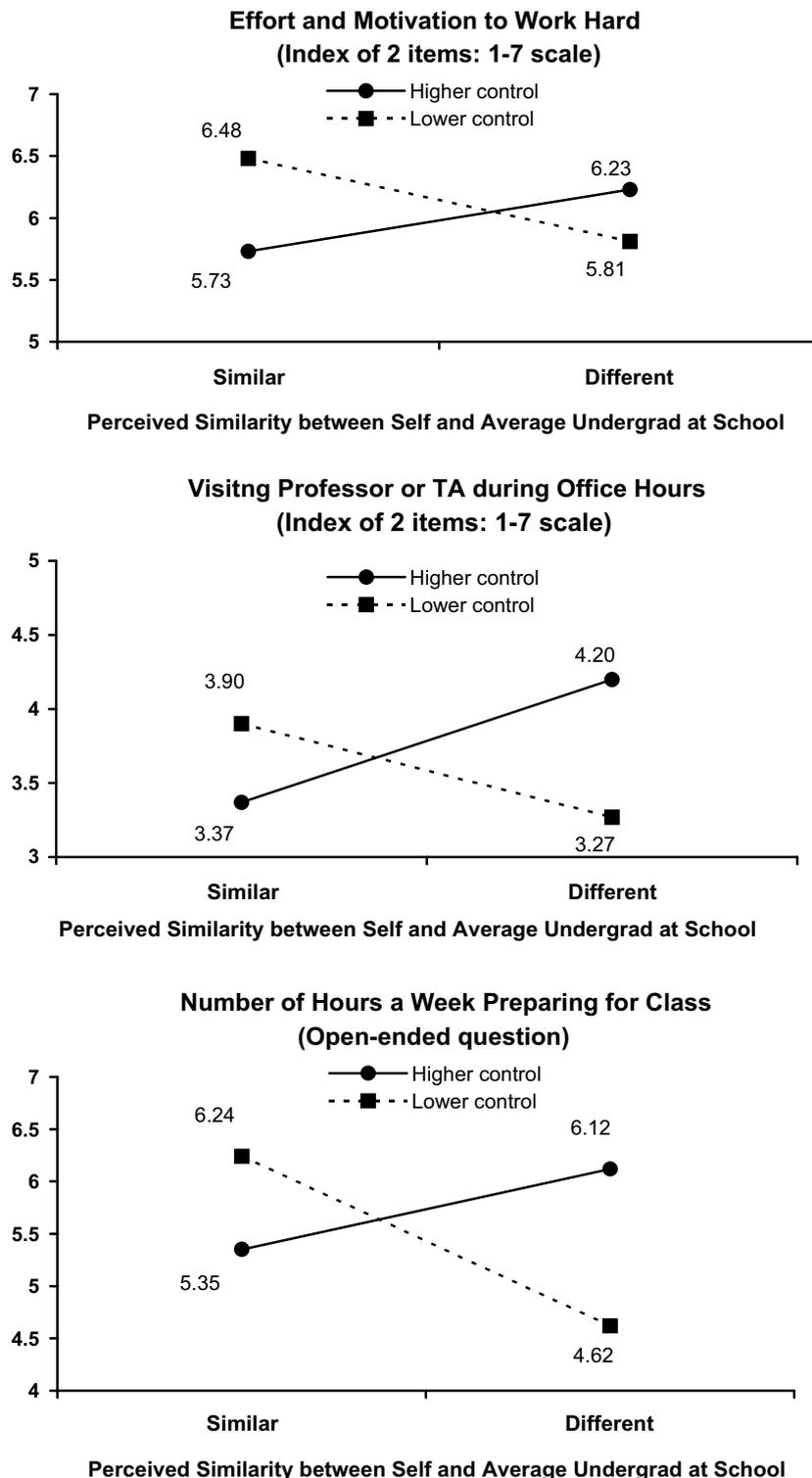


Fig. 5. Study 3: Enhancing comparative optimism and attenuating comparative pessimism yield higher behavioral intentions to attain a positive outcome.

contrast $F(4, 86) = 2.38, p < .05$. These results support H5. Fig. 5 presents the graphical pattern of means for each of the three behavioral intention measures. The multivariate results hold for each individual measure as well.

Discussion

In this study, we replicated the results from the previous studies and expanded the dependent measures to include behavioral intentions. We found that in situations encouraging comparative optimism, people are motivated to work harder to attain positive outcomes when the dissimilarity between self and the comparison target is enhanced. In contrast, in situations encouraging comparative pessimism, people are motivated to work harder when the similarity between self and the comparison target is enhanced. We also demonstrated that perceptions of control over the outcome for self and the comparison target vary in ways to support the two biases. Furthermore, note that the changes in perceived controllability are driven by changes in perceptions of control for *self* rather than the comparison target, as demonstrated through the significant three-way interaction and the mediation analysis, replicating the results from Study 1 and attesting to the robustness of these effects.

General discussion

As we noted earlier, research on when the comparative optimism and pessimism biases manifest is limited and these biases have not been examined together to date. In this paper, we report evidence for perceived controllability of an outcome as a factor that determines when a comparative optimism versus pessimism bias occurs. Furthermore, we identified perceived similarity from a comparison target as a variable that *attenuates* both biases. Unlike previous research that examines either comparative optimism or pessimism biases, we examine both these biases while controlling for outcome valence (positive outcomes), comparison target (average undergraduate at the school), as well as event domain (kept constant in Studies 1 and 3). We also employ indirect measures of bias, which typically results in less bias than direct measures, further illustrating the robustness of the effects (Klein & Helweg-Larsen, 2002). We now discuss the theoretical implications of some of our more noteworthy findings.

Perceptions of outcome controllability

Several results pertaining to perceptions of outcome controllability are worth noting. First, our studies integrate a variety of findings in the extant literature by identifying outcome controllability as a variable that determines whether a comparative optimism or pessimism bias manifests. Past research has demonstrated that in domains of low absolute skill, people show below-average effects (e.g., Kruger, 1999). Consistent with this, Lin et al. (2004) unexpectedly found that in domains of low controllability, people can form pessimistic judgments. Klar et al. (1996) find that in the realm of negative outcomes, negative outcomes seen as more controllable lead to a greater comparative optimism bias for both self and similar others. Our results tie these findings together by manipulating controllability using the same domain for each study, establishing these findings are driven by perceptions of outcome controllability and not the result of possible domain change.

Second, perceptions of outcome controllability about oneself compared to a target other even *within* a higher or lower control domain appear to be a significant driver of these effects. These perceptions of control vary systematically as a function of similarity between targets (Studies 2a, 2b, and 3) and general controllability

of the domain (Studies 1 and 3). However, note that the perceptions that vary as a function of these interventions are those related to the self; perceptions of how much control the average other has varies less as a function of any of these manipulations (see specifically results of Study 3, in particular the mediation analysis). The movement we observed in our studies was that of the self converging to or diverging from the average. Past research that has relied on direct measures of comparative judgments has been unable to address whether self-other discrepancies arise due to changes in perceptions of the self or the average. Our results suggest that while self-perceptions of controllability are malleable, perceptions of the average person's control are less so. One potential explanation is the account advanced by Kruger and his colleagues that the self is more salient and hence is the locus of movement in judgments of skill (Kruger, 1999; Windschitl et al., 2003). Although our results suggest that this self-focus, which has only been found for direct comparisons, holds for contexts that involve indirect comparisons, this issue is worthy of further investigation.

Perceptions of similarity

Across the four studies, we also found that perceptions of similarity attenuated the comparative optimism and pessimism biases. When similarity was increased by priming similarities versus differences, people reported estimates of outcome likelihood and perceptions of control for the self that were closer to their estimates for others. Both the comparative optimism and pessimism bias were diminished. These effects stem from self-estimates moving closer to estimates for the comparison target (e.g., results from Studies 2a, 2b, and 3).

Note that in our studies, similarities and differences were primed regardless of domain or relevance of the similarity to the subsequent judgment. Our methodology presented the similarity manipulation as unrelated to the judgments of likelihood. This suggests that general perceptions of similarity or differences would lead to our effects. However, it is possible that if similarities within a specific domain unrelated to the likelihood judgments are made salient (e.g., highlighting similarity in dancing skills and eliciting the likelihood of getting good grades), similarities might not attenuate comparative biases. Future research should investigate this issue.

Additionally, similarity might lead to the effects of social distance in likelihood judgments. For example, a friend is socially closer to the self than an average peer, but a friend might also be more similar. It has been shown that self-friend discrepancies and other individualized or concrete self-target discrepancies might be smaller than self-average discrepancies (Perloff & Fetzer, 1986; Raghuram & Menon, 1998; Rothman, Klein, & Weinstein, 1996; Van der Velde, Hooykaas, & van der Plight, 1992; Van der Velde, van der Plight, & Hooykaas, 1994; Weinstein, 1980). Could these effects of distance be due to similarity? Future research could manipulate different levels of social distance as well as similarity in the same design to understand the relationship between distance and similarity and the extent to which this dichotomous effect holds for comparisons with a specific versus more generalized other.

Motivating people to act to attain positive outcomes

The implications of Study 3 are important from a standpoint of understanding how one might motivate individuals to take action in domains of education, employee incentive schemes and beneficial public behaviors. Given circumstances that might vary in perceived level of control, how can framing a situation to highlight similarities versus differences with peers be used to motivate desired behavioral action?

Past research has offered different insights into the relationship between comparative optimism and behavior. One stream of research has argued that comparative optimism creates an illusion that one is not susceptible to negative events and will therefore lead to lower behavioral intentions (e.g., Raghurib & Menon, 1998). On the other hand, a different stream of research has argued that positivity leads to greater behavioral intention because it serves as a motivator to act (e.g., Taylor & Brown, 1988; Taylor & Sherman, 2003). Our results are distinctive in that they identify controllability as a factor that determines when comparative optimism and pessimism lead to higher behavioral intentions to attain a positive outcome. When people felt they had control over the outcome they were more likely to act. This idea has been established with patients in highly motivated contexts, where patients are much more likely to comply with the treatment if they believe it is more likely to work for themselves than for others (Taylor et al., 2000). Our studies show that indeed, in contexts where people felt more control over their outcomes, they were more optimistic about their prospects and hence more likely to work. On the other hand, there is little research that examines the behavioral consequences of pessimism. Our results suggest that people who are pessimistic are likely to feel less control and hence are less likely to take action. Thus, pessimism driven by perceptions of low control can be de-motivating. A promising area of future research is understanding how manipulating primary (i.e. behavioral) versus secondary (i.e. cognitive) control motivates behavior in cases of optimistic versus pessimistic bias (Klein & Helweg-Larsen, 2002; Rothbaum, Weisz, & Snyder, 1982).

Having said this, it is important to note that similarity can also have impact on behavioral intentions. When control is high, increasing perceived similarity reduces perceptions of control, leading to lower behavioral intentions. But when control is low, dissimilarity increases perceptions of control leading to higher intentions. Therefore, similarity is a variable that attenuates the two biases, but has differential effects on behavior. So it may not always be beneficial to increase similarity and decrease biased assessments. Our results are a good example of when two generally good prescriptions of reducing comparative optimism and increasing perceptions of similarity can have undesirable behavioral consequences. In other words, allowing people to be a bit “selective” in the reality they choose to accept can motivate them to act.

References

- Alicke, M. D., Klotz, M. L., Breitenbecher, D. L., Yurak, T. J., & Vredenburg, D. S. (1995). Personal contact, individuation, and the better-than-average effect. *Journal of Personality and Social Psychology*, 68, 804–825.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Chambers, J. R., & Windschitl, P. D. (2004). Biases in social comparative judgments: The role of nonmotivated factors in above-average and comparative-optimism effects. *Psychological Bulletin*, 130, 813–838.
- Chambers, J. R., Windschitl, P. D., & Suls, J. (2003). Egocentrism, even frequency, and comparative optimism: When what happens frequently is “more likely to happen to me”. *Personality and Social Psychology Bulletin*, 29, 1343–1356.
- Chandran, S., & Menon, G. (2004). When a day means more than a year: Effects of temporal framing on judgments of health risk. *Journal of Consumer Research*, 31, 375–389.
- Chartrand, T. L., & Bargh, J. A. (2002). *Nonconscious motivations: Their activation, operation, and consequences*. Washington, DC: American Psychological Association Press.
- Dunning, D., Heath, C., & Suls, J. M. (2004). Flawed self-assessment. Implications for health, education, and the workplace. *Psychological Science in the Public Interest*, 5, 69–106.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior*. Massachusetts: Addison-Wesley Reading.
- Harris, P. (1996). Sufficient grounds for optimism? The relationship between perceived controllability and optimism bias. *Journal of Social and Clinical Psychology*, 15, 9–52.
- Harris, P., & Middleton, W. (1994). The illusion of control and optimism about health: On being less at risk but no more in control than others. *British Journal of Social Psychology*, 33, 369–386.
- Heine, S. J., & Lehman, D. R. (1997). The cultural construction of self-enhancement: An examination of group-serving biases. *Journal of Personality and Social Psychology*, 72, 1268–1283.
- Helweg-Larsen, M., & Shepperd, J. A. (2001). Do moderators of the optimistic bias affect personal or target risk estimates? A review of the literature. *Personality and Social Psychology Review*, 5, 74–95.
- Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, 94, 319–340.
- Keller, P. A., Lipkus, I. M., & Rimer, B. K. (2002). Depressive realism and health risk accuracy: The negative consequences of positive mood. *Journal of Consumer Research*, 29, 57–69.
- Klar, Y., Medding, A., & Sarel, D. (1996). Nonunique invulnerability: Singular versus distributional probabilities and unrealistic optimism in comparative risk judgments. *Organizational Behavior and Human Decision Processes*, 67, 229–245.
- Klein, C., & Helweg-Larsen, M. (2002). Perceived control and the optimistic bias: A meta-analytic review. *Psychology & Health*, 17, 436–437.
- Klein, W. M., & Weinstein, N. D. (Eds.). (1997). *Social comparison and unrealistic optimism about personal risk*. Mahwah, NJ, US: Lawrence Erlbaum Associates, Publishers.
- Kruger, J. (1999). Lake Wobegon be gone! The “below-average effect” and the egocentric nature of comparative ability judgments. *Journal of Personality and Social Psychology*, 77, 221–232.
- Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology*, 77, 1121–1134.
- Lin, Y.-C., Lin, C.-H., & Raghurib, P. (2003). Avoiding anxiety, being in denial, or simply stroking self-esteem: Why optimism? *Journal of Consumer Psychology*, 13, 464–477.
- Lin, Y.-C., Lin, C.-H., & Raghurib, P. (2004). The interaction between order of elicitation and event controllability on the optimism bias. *Advances in Consumer Research*, 31, 1–7.
- Luce, M. F., & Kahn, B. E. (1999). Avoidance or vigilance? The psychology of false-positive test results. *Journal of Consumer Research*, 26, 242–259.
- McConnell, A. R., Sherman, S. J., & Hamilton, D. L. (1994). On-line and memory-based aspects of individual and group target judgments. *Journal of Personality and Social Psychology*, 67, 173–185.
- McConnell, A. R., Sherman, S. J., & Hamilton, D. L. (1997). Target entitativity: Implications for information processing about individual and group targets. *Journal of Personality and Social Psychology*, 72, 750–762.
- Menon, G., Block, L. G., & Ramanathan, S. (2002). We're at as much as risk as we are led to believe: Effects of message cues on judgments of health risk. *Journal of Consumer Research*, 28, 533–549.
- Menon, G., Raghurib, P., & Schwarz, N. (1995). Behavioral frequency judgments: An accessibility-diagnosticity framework. *Journal of Consumer Research*, 22, 212–228.
- Messick, D. M., Bloom, S., Boldizar, J. P., & Samuelson, C. D. (1985). Why are fairer than others. *Journal of Experimental Social Psychology*, 21, 480–500.
- Mussweiler, T. (2003). Comparison processes in social judgment: Mechanisms and consequences. *Psychological Review*, 110, 472–489.
- Mussweiler, T., & Bodenhausen, G. V. (2002). I know you are but what am I? Self-evaluative consequences of judging in-group and out-group members. *Journal of Personality and Social Psychology*, 82, 19–32.
- Perloff, L. S., & Fetzer, B. K. (1986). Self-other judgments and perceived vulnerability to victimization. *Journal of Personality and Social Psychology*, 50, 502–510.
- Raghurib, P., & Menon, G. (1998). AIDS and me, never the twain shall meet: The effects of information accessibility on judgments of risk and advertising effectiveness. *Journal of Consumer Research*, 25, 52–63.
- Rothbaum, F., Weisz, J. R., & Snyder, S. S. (1982). Changing the world or changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology*, 42, 5–37.
- Rothman, A. J., Klein, W. M., & Weinstein, N. D. (1996). Absolute and relative biases in estimations of personal risk. *Journal of Applied Social Psychology*, 26, 1213–1236.
- Sedikides, C., Campbell, W. K., Reeder, G. D., & Elliot, A. J. (1998). The self-serving bias in relational context. *Journal of Personality and Social Psychology*, 74, 378–386.
- Shepperd, J. A., Helweg-Larsen, M., & Ortega, L. (2003). Are comparative risk judgments consistent across time and events? *Personality and Social Psychology Bulletin*, 29, 1169–1180.
- Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, 103, 193–210.
- Taylor, S. E., Kemeny, M. E., Reed, G. M., Bower, J. E., & Gruenewald, T. L. (2000). Psychological resources, positive illusions, and health. *American Psychologist*, 55, 99–109.
- Taylor, S. E., Lerner, J. S., Sherman, D. K., Sage, R. M., & McDowell, N. K. (2003). Are self-enhancing cognitions associated with healthy or unhealthy biological profiles? *Journal of Personality and Social Psychology*, 85, 605–615.
- Tice, D. M., Butler, J. L., Muraven, M. B., & Stillwell, A. M. (1995). When modesty prevails: Differential favorability of self-presentation to friends and strangers. *Journal of Personality and Social Psychology*, 69, 1120–1138.

- Van der Velde, F. W., Hooykaas, C., & van der Plight, J. (1992). Risk perception and behavior: Pessimism, realism, and optimism about AIDS-related health behavior. *Psychology and Health, 6*, 23–38.
- Van der Velde, F. W., van der Plight, J., & Hooykaas, C. (1994). Perceiving AIDS-related risk: Accuracy as a function of differences in actual risk. *Health Psychology, 13*, 25–33.
- Weinstein, N. D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology, 39*, 806–820.
- Weinstein, N. D. (1982). Unrealistic optimism about susceptibility to health problems. *Journal of Behavioral Medicine, 5*, 441–460.
- Weinstein, N. D. (1984). Why it won't happen to me: Perceptions of risk factors and susceptibility. *Health Psychology, 3*, 431–457.
- Weinstein, N. D. (1987). Unrealistic optimism about susceptibility to health problems: Conclusions from a community-wide sample. *Journal of Behavioral Medicine, 10*, 481–500.
- Windschitl, P. D., Kruger, J., & Simms, E. N. (2003). The influence of egocentrism and focalism on people's optimism in competitions: When what affects us equally affects me more. *Journal of Personality and Social Psychology, 85*, 389–408.