
Anxiety and Outcome Predictions

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Research shows that people display a downward shift in their predictions in anticipation of performance and feedback. The authors used a misattribution paradigm to explore whether anxiety serves as a signal for predictions. Participants (N = 108) anticipating results from an important test either immediately or in a few days were or were not encouraged to attribute any arousal they experienced to coffee they consumed earlier. Consistent with predictions, participants encouraged to attribute their arousal to the coffee were optimistic in their predictions even when anticipating immediate test feedback. In addition, the more participants attributed their arousal to the coffee, the more optimistic they were in their predictions. Ancillary analyses suggest that anxiety can be a cause rather than a consequence of less optimistic predictions.

Keywords: *expectations; anxiety; risk judgments; optimism*

The past two decades have witnessed a dramatic shift in how psychologists view mental health. The traditional approach to mental health involved relatively accurate perceptions of the self. Perceptions that were overly optimistic or overly pessimistic were generally regarded as evidence of poor functioning (Allport, 1943; Fromm, 1955; Maslow, 1950). More recently, researchers have proposed that mental health is best characterized by positive illusions and that healthy people have an overly positive view of the self, exaggerated perceptions of control, and unrealistically optimistic expectations for the future (S. E. Taylor & Brown, 1988). Numerous theorists have proposed that normal social perception systems have a variety of social and cognitive filters in place that serve to screen and distort information in self-serving ways (Greenwald, 1980; Pyszczynski & Greenberg, 1987; S. E. Taylor & Brown, 1988).

Most notable of the various positive illusions is perhaps unrealistic optimism whereby people maintain that their future is bright and getting brighter. Optimism is

unique because researchers have linked it to a variety of emotional, social, and health benefits (e.g., Alloy & Ahrens, 1987; Aspinwall & Taylor, 1992; Carver & Scheier, 1981; Raikkohen, Matthews, Flory, Owens, & Gump, 1999; Reed, Kemeny, Taylor, Wang, & Visscher, 1994; Scheier & Carver, 1985, 1988; Scheier et al., 1989; Segerstrom, Taylor, Kemeny, & Fahey, 1998; Shepperd, Morato, & Pbert, 1996; S. E. Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000).

The research demonstrating optimism and its benefits typically examine either trait optimism (a dispositional tendency to view the future positively) or optimism about abstract, distant events that may never occur (i.e., the likelihood of cancer in one's lifetime). In these instances, the benefits of an optimistic outlook draw from related outcomes such as greater motivation, persistence, and goal-directed behavior or at the very least, the capacity for optimism to generate positive affect. However, when events are more concrete or immediate, the benefits of an optimistic outlook may diminish, and evidence suggests that people will sometimes shelve their optimism for a more realistic or even pessimistic outlook.

For example, participants in one study predicted their score on a classroom exam on four occasions (Shepperd, Ouellette, & Fernandez, 1996). At Time 1, 3 weeks prior to the exam, students were quite optimistic in their performance predictions. Immediately after taking the exam (Time 2) and again 30 minutes prior to receiving their exam score (Time 3), the students shifted

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from optimism to accuracy in their predictions. In the moments just before receiving their feedback (Time 4), students became decidedly pessimistic in their predictions, predicting on average a score lower than they actually received (see also Gilovich, Kerr, & Medvec, 1993; Sanna, 1999; Sanna & Meier, 2000). In a second study, participants predicted the likelihood that they would test positive for a medical condition with serious consequences. Participants who anticipated receiving their test results in a few moments were pessimistic in their predictions, whereas participants who anticipated no feedback were not (K. M. Taylor & Shepperd, 1998). These studies suggest that as events draw near and pass and people move from awaiting the “test” to awaiting news of the outcome, people will often trade their optimism for a more grim prognostication (see Shepperd, Dockery, & Carroll, in press, for a review).

Fluctuations in Future Outlooks

What prompts people to shift from optimism in their personal predictions across time? A recent review article suggests the following two broad categories of explanations for the shift: (a) People are responding to new information bearing on the accuracy of personal predictions, and (b) people are bracing for possible undesired news (Shepperd et al., in press). Regarding the information-based category, the new information may come in three forms. First, as events or outcomes draw near, people often gain new data or greater clarity about existing data that adds greater precision to judgments of what is likely to transpire. For example, as an exam draws near, students wishing to predict their performance often have more information about the difficulty of the material, how much time they have to study, and the other obligations demanding their time. Second, people may gain greater clarity on existing information either in response to accountability pressures (Lerner & Tetlock, 1999) or in response to a shift in the construal of the event from abstract to concrete (Lieberman & Trope, 1998), which can reduce biases in perception and decision processes (Tetlock & Kim, 1987). Third, people may treat their current mood as a source of information (Schwarz & Clore, 1983). Specifically, as feedback draws near, people note their increasing anxiety and infer that if they feel anxious, it must be because they did poorly. In short, people interpret their anxiety as important information about the status of their outcome (Gilovich et al., 1993).

According to the second category of explanations for the downward shift in predictions, people are not simply recalibrating their predictions in response to new information. Rather, they are readying themselves or bracing for the possibility of an undesired outcome—the possibility that things may not turn out as hoped. Bracing has

three manifestations, and each reflects a different type of coping response. First, bracing may represent the cognitive strategy of defensive pessimism (Norem & Cantor, 1986) whereby people predict disaster prior to performance, then channel the anxiety they experience as a consequence of the prediction toward actions that make sure the disaster does not transpire. Second, bracing may reflect a form of magical thinking undertaken to influence outcomes after performance yet prior to feedback. Specifically, some people appear to believe that their predictions can inversely influence their outcomes; predicting pessimistically causes desired outcomes to occur and predicting optimistically produces a “jinx” that causes undesired outcome to occur. Magical thinking represents a belief in causal forces operating outside the realm of normal physical laws and emerges when primary avenues of control end or are absent (Rozin & Nemeroff, 1990).

A third reason for the shift in predictions can occur prior to or after performance and reflects an attempt to cope with the aftermath of an undesired outcome rather than influence the outcome before it occurs. Specifically, people may brace to avoid feelings of disappointment (or perhaps regret) that occur when outcomes fall short of expectations. Bad news feels unpleasant in its own right. However, it is particularly unpleasant when it comes as a surprise (Shepperd & McNulty, 2002). People are quite sensitive to the link between expectations and feelings about their outcomes and will adjust their expectations to regulate their future affect.

The Role of Anxiety

A common thread in several of the explanations is the assumption that the downward shift in predictions reflects a response to mounting anxiety. As noted by Sanna and Meier (2000), the anxiety may come from some unrelated source (Sanna, 1999), from gearing up to perform (Savitsky, Medvec, Charlton, & Gilovich, 1998), from mental simulations of how things could go wrong (Sanna & Meier, 2000), or from thoughts about the prospect of disappointment (Shepperd, Ouellette, et al., 1996). Regardless of its source, the anxiety often produces a downward shift in outlook. For instance, the mood-as-information explanation proposes that people interpret the rising anxiety they experience in anticipation of feedback as information that the outcome will be undesirable. In a similar vein, Shepperd, Ouellette, et al. (1996) proposed that the anticipation of performance and feedback prompts thoughts about the possibility of disappointment, and anxiety over the prospect of disappointment prompts less optimistic predictions. In both cases, anxiety serves as a signal to make less optimistic predictions.

Aside from the theoretical basis, several studies document that as feedback draws near, anxiety reports increase and predictions become less optimistic (Shepperd, Ouellette, et al., 1996; K. M. Taylor & Shepperd, 1998). For example, in the study examining predictions regarding the results of a medical test, the greater anxiety participants reported, the more they believed they would test positive for the medical condition (K. M. Taylor & Shepperd, 1998).

Finally, in preparing this article we asked undergraduates ($N = 136$) enrolled in a psychology class whether they had ever predicted their grade after taking an exam, yet revised their prediction downward as the professor returned the exams. Participants who indicated they had done so then described why they lowered their prediction. Of the participants, 30 reported never having done this, 3 said that they had but provided no reason, and 7 provided reasons suggesting that they misunderstood the question. Of the remaining 96 participants, the two most common reasons offered by participants were to avoid disappointment (37%) and because of anxiety, nervousness, or insecurity about their score (26%). The remaining participants offered a smattering of other reasons such as learning new information (11%), experiencing doubts (10%), second-guessing themselves (10%), and correcting for initial overconfidence (5%).

The evidence presented thus far is based on self-reports and does not reveal whether anxiety serves as a signal to make lower predictions. If anxiety serves as a signal to shift from optimism, then inducing people to believe that any anxiety they are experiencing is actually due to some other cause should reduce or eliminate the decline in optimism. A study from the literature on confidence judgments supports this reasoning using a misattribution paradigm, a paradigm finely honed by emotion researchers to isolate the role of emotion in judgment (Clore & Parrott, 1994; Martin, Harlow, & Strack, 1992; Schwarz & Clore, 1983). Participants reported their confidence in their ability to perform well on a forthcoming task. They made their predictions while ostensibly listening to subliminal noise. Some participants believed the subliminal noise would make them anxious, whereas others believed it would have no physical effects. Participants induced to misattribute their anxiety to the subliminal noise were more confident about their ability on the upcoming task than were participants who believed the noise would have no effect (Savitsky et al., 1998).

In the present study we also used a misattribution paradigm to explore whether anxiety serves as a signal that more conservative predictions are in order. Predictions, although sharing features in common with confidence judgments, are nevertheless distinct. Predictions represent an estimate of what is going to happen (i.e., an out-

come), whereas confidence represents the feeling of certainty or conviction that underlies a prediction. Although predictions and confidence estimates are likely to show some correspondence, confidence judgments are likely to be more labile. Indeed, people may display huge fluctuations in confidence ratings while displaying little or no fluctuation in predictions. Such would be the case in a game of chance where one is betting on whether the next card overturned in a deck will be a red suit (a diamond or heart) or a black suit (a spade or club). If a lot of money is riding on the outcome, people may show huge fluctuations in their confidence but relatively small fluctuations in their predictions. This is not to say the changes in predictions will not occur but rather that the changes may not always be identical to changes in confidence.

Overview of the Present Research

In our study we examined the predictions people make after a performance and prior to receiving feedback. Participants took a test and learned they would receive the results in a few days or in a few moments. To examine whether perceptions of anxiety prompt downward shifts in predictions, participants learned either that a cup of coffee they had consumed earlier was highly caffeinated and would produce feelings of arousal or was decaffeinated and would thus produce no effects. In the no caffeine (control) condition, we hypothesized that participants would predict a higher score when they anticipated test feedback in a few days than when they anticipated test feedback immediately. By contrast, in the caffeine (misattribution) condition where people could attribute any arousal to the coffee, we predicted that immediate feedback participants would be just as optimistic as delayed feedback participants in their predictions.

METHOD

Participants

Introductory psychology students ($N = 108$) participated as part of a course requirement and were randomly assigned to conditions in a 2 (misattribution vs. control) \times 2 (immediate vs. delayed feedback) factorial design. Data from 7 participants were discarded (because they failed to respond to the primary dependent variable or because they supplied a predicted score well below chance), leaving a total of 101 (72 female, 29 male) participants. Experimental sessions consisted of 1 to 3 participants, and participants within sessions were run in the same condition. To enhance the believability of the manipulation, all participants received instructions when they signed up for the experiment not to

drink any caffeinated beverages for 12 hours before the experiment.

Procedure

On their arrival, the experimenter escorted participants to separate cubicles and explained that they were participating in two unrelated experiments. The first experiment would ostensibly establish local norms for a measure of intelligence. Participants learned that they would take the Verbal Reasoning Analogies Test (V-RAT), a 40-item test measuring verbal intelligence and modeled after other standardized tests such as the SAT and ACT. The experimenter explained that the test was highly reliable and correlated with academic and career success. The second experiment ostensibly examined the effects of caffeinated coffee on motor performance. The experimenter explained that the American Coffee Importers Association funded the second experiment and wished to know whether caffeinated coffee affects motor performance.

After these instructions, participants consumed a 6-ounce cup of coffee (always decaffeinated) and were told that any effects of the coffee would not be felt for about 20 minutes, well after they completed the test. The experimenter then administered the V-RAT. The experimenter read through the instructions, informed participants that they would have 12 minutes to complete the test, stated that there was no penalty for guessing, and encouraged participants to supply an answer to every item. The experimenter then began the test period. After 12 minutes, the experimenter collected the tests and took them down the hall for scoring, stating that participants would receive their scores in the mail in 3 days.

On returning, the experimenter introduced the feedback timing and attribution manipulations. Participants in the *immediate feedback* condition were told that the person who scored the test was unexpectedly available and that they would receive their test scores before the end of the experiment. Participants in the *delayed feedback* condition received no such information and continued to believe that they would receive their test scores in 3 days. The experimenter next told participants in the *misattribution* condition that the coffee they consumed was highly caffeinated and that they may experience a slight trembling, a fluttering of the heart, increased perspiration, and probably some slight anxiety feelings. These instructions were delivered roughly 20 minutes after participants had consumed the cup of coffee and were intended to lead participants to attribute any anxiety feelings they might have about the intelligence test to the coffee. The experimenter told participants in the *control* condition that the coffee they consumed was decaffeinated and was unlikely to produce any effects.

All participants learned that they would perform several motor tasks in a few moments but that they first would complete a questionnaire about their coffee consumption, a questionnaire assessing any changes they felt as a result of the coffee (although the experimenter emphasized in the control condition that no effects were expected), and a questionnaire asking their thoughts about the test they just completed. Participants then completed a survey regarding their daily caffeine consumption. In the immediate feedback condition, the experimenter used the time to retrieve participants' test scores. To enhance the validity of the cover story, the experimenter subsequently reviewed the caffeine consumption survey in detail with participants, taking notes and probing for more information. Immediate feedback participants then learned that their test was scored. However, for privacy reasons, the experimenter was not permitted to see the scores. The experimenter then produced envelopes for each immediate feedback participant with a test score ostensibly sealed inside but informed them that they must complete two brief questionnaires, one for the coffee study and one for the intelligence test study, before opening their envelopes. Delayed feedback participants completed the same two questionnaires but continued to believe that they would receive their feedback in several days.

The first questionnaire comprised 10 adjectives (calm, tense, nervous, at ease, anxious, self-confident, jittery, relaxed, worried, joyful) drawn from the state form of the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970) and instructions for participants to indicate how they "felt right now, at this moment." Each item was followed by a 4-point response scale (1 = *not at all*, 2 = *somewhat*, 3 = *moderately so*, 4 = *very much so*). These items were summed (after reverse coding) to form a single index of state anxiety (Grand $M = 19.2$, $SD = 4.80$, Cronbach's $\alpha = .83$). At the bottom of the questionnaire was a single item asking participants the extent to which their responses were the result of the coffee they drank. Participants responded using a 9-point scale (1 = *not at all*, 9 = *very much*).

The second questionnaire comprised four items asking about the V-RAT and was modeled after a questionnaire developed by Spencer and Steele (1994). The instructions reminded participants that there were 40 items on the V-RAT. Participants then indicated on a scale of 1 to 40 (a) the highest score they thought they would receive, (b) the lowest score that would fall within their expectations, (c) the score they thought the average person would get, and (d) the exact score they thought they would receive. Although participants supplied responses to all four items, our interest was exclusively in participants' exact prediction, which when viewed relative to participants' actual score provided the

TABLE 1: Responses to All Measures and the Number of Participants Making Optimistic and Nonoptimistic Predictions by Condition

Responses to All Measures	Immediate				Delayed			
	Misattribution		Control		Misattribution		Control	
	M	SD	M	SD	M	SD	M	SD
Predicted score	27.9	5.0	25.0	4.9	27.4	5.6	28.2	5.1
Actual score	25.5	2.3	25.4	3.4	24.9	4.4	25.3	4.8
Anxiety	19.8	4.7	18.0	4.7	20.6	4.1	18.3	4.7
Anxiety attributions	3.8	2.4	1.8	1.2	4.1	2.2	2.5	1.7
Frequencies								
Optimists	16		10		20		20	
Nonoptimists	9		15		6		5	

best test of our hypothesis. On completion of the questionnaires, the experimenter stopped the experiment and debriefed participants. The tests were not actually scored, and thus participants did not receive test feedback.

RESULTS

Unless otherwise indicated, data were analyzed using a 2 (misattribution vs. control) × 2 (immediate vs. delayed feedback) between-subjects ANOVA. The top half of Table 1 presents the mean responses to all measures.

Manipulation Checks

Analysis of the state anxiety index yielded a single significant effect of the attribution manipulation, $F(1, 97) = 4.98, p < .05, \eta^2 = .05$. Participants reported experiencing greater anxiety in the misattribution condition ($M = 20.2, SD = 4.38$) than in the control condition ($M = 18.1, SD = 5.02$). This effect is not surprising and likely arises from the instructions making misattribution participants more sensitive to their internal state or more willing to report feelings of arousal. More important for our purposes was the extent to which participants attributed their arousal to the coffee. Analysis of this item yielded a single significant effect of the attribution manipulation, $F(1, 97) = 20.93, p < .0001, \eta^2 = .18$. Participants were more likely to attribute their arousal to the coffee in the misattribution condition ($M = 3.9, SD = 2.32$) than in the control condition ($M = 2.1, SD = 1.49$).

Test Score Predictions

Did misattributing their arousal to the coffee eliminate bracing among participants anticipating immediate test feedback? To address this question, we created a difference score by subtracting the score participants actually received on the test from the score they predicted receiving. We then analyzed the difference score to test specific hypotheses. A positive difference score indicates that participants were optimistic, predicting a

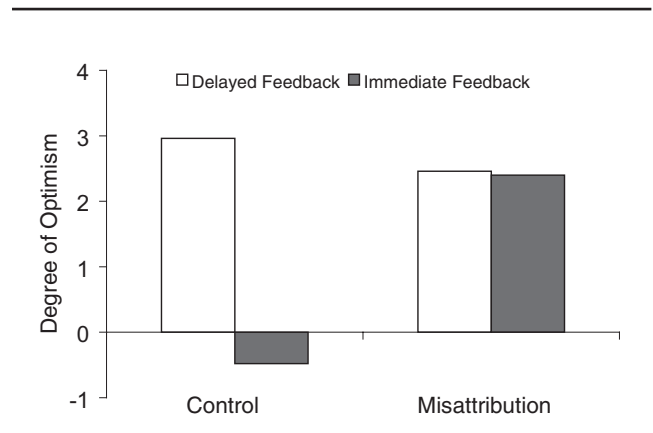


Figure 1 Exam score predictions.

score higher than they actually received, whereas a negative score indicates that participants were pessimistic, predicting a score lower than they actually received. Of note, participants did not differ across conditions in their actual test scores (Grand $M = 25.3, SD = 3.82$), all $F_s < 1, \eta^2 = .00$.

Figure 1 presents by condition the mean difference between the actual and predicted scores. Consistent with prior research (Shepperd, Ouellette, et al., 1996), participants in the control condition were optimistic in their predictions when they anticipated learning their score in 3 days but not when they anticipated learning their score immediately. In the misattribution condition, where any anxiety feelings could be attributed to the coffee, participants were optimistic regardless of whether they anticipated learning their scores immediately or later.

We tested the comparisons statistically in a series of planned contrasts using the pooled error term. Statistical analyses revealed that control/immediate feedback participants ($M = -.5, SD = 4.6$) displayed less optimism than did control/delayed feedback participants ($M = 3.0, SD = 4.2$), $t(99) = 2.26, p < .05, \eta^2 = .05$, and misattribution/immediate feedback participants ($M = 2.4,$

$SD = 4.9$), $t(99) = 2.01$, $p < .05$, $\eta^2 = .04$. Misattribution/immediate feedback participants did not differ from misattribution/delayed feedback participants ($M = 2.5$, $SD = 5.3$) in their optimism, $t(99) < 1$, $\eta^2 = .00$.

Comparing means does not tell us whether participants were truly optimistic in all but the control/immediate feedback condition. To answer this question, we conducted a series of dependent t tests that compared the scores participants predicted receiving with the scores they actually received. Participants significantly overestimated their scores in the misattribution/delayed feedback condition, $t(100) = 2.36$, $p < .05$, the misattribution/immediate feedback condition, $t(100) = 2.45$, $p < .05$, and the control/delayed feedback condition, $t(100) = 3.53$, $p < .05$. In the control/immediate feedback condition, participants' predicted and actual scores did not differ, $t(100) < 1$. In short, although participants were generally optimistic, they abandoned their optimism when they anticipated immediate feedback and could not attribute their anxious feelings to the coffee.

Finally, we examined the number of participants in each condition who supplied optimistic predictions (i.e., predictions that exceeded the actual score participants received). As evident in the bottom of Table 1, only in the control/immediate feedback condition were fewer participants optimistic than not optimistic. Chi-square analyses revealed that in the misattribution condition, there was no difference in the number of delayed feedback and immediate feedback participants who were optimistic, $\chi^2 = 1.03$, *ns*. By contrast, in the control condition significantly fewer immediate feedback participants than delayed feedback participants were optimistic, $\chi^2 = 8.33$, $p < .01$.

Exploring the Role of Anxiety

If anxiety is driving the change in predictions, then in the control condition greater anxiety should correspond to less optimistic predictions. By the same token, in the misattribution condition, anxiety should be uncorrelated with optimism because any feelings of anxiety over the test score could be misattributed to the coffee. To test this reasoning, we correlated anxiety scores with the difference score generated by subtracting participants' actual scores from their predicted scores. Correlations were computed separately for the misattribution and control conditions. As predicted, anxiety was negatively correlated with the difference score in the control condition, $r(50) = -.26$, $p < .07$, but was uncorrelated with the difference score in the misattribution condition, $r(51) = .15$, $p > .25$.

We also reasoned that the extent to which participants reported their responses to the anxiety scale were due to the coffee would be uncorrelated with optimism in the

control condition where the coffee was not provided as an explanation for any anxious feelings. Conversely, we predicted that responses to this item would correlate positively with optimism in the misattribution condition. That is, the more participants attributed their anxiety to the coffee, the greater optimism they would report in their predictions. Consistent with this reasoning, the item asking participants the extent to which their responses on the anxiety scale were due to the coffee was uncorrelated with optimism in the control condition, $r(50) = .07$, $p > .61$, but positively correlated with optimism in the misattribution condition, $r(51) = .28$, $p < .05$.

One might also argue that anxiety was a consequence rather than a cause of the decline in predictions. That is, our results arose from participants becoming anxious as a result of making less optimistic predictions. To probe this possibility, we examined the level of anxiety reported by participants in the misattribution/immediate feedback and control/immediate feedback conditions. If anxiety is a consequence of declining predictions, then participants anticipating immediate feedback should report greater anxiety when they made nonoptimistic predictions (i.e., control condition) than when they made optimistic predictions (i.e., in the misattribution condition). An independent t test revealed no support for this explanation, $t(50) = 1.62$, $p > .11$, $\eta^2 = .05$. Indeed, the pattern of means was in a direction opposite of this prediction, with participants reporting greater anxiety in the misattribution/immediate feedback condition ($M = 20.2$) than in the control/immediate feedback condition ($M = 17.9$).

In summary, the findings suggest that anxiety can serve as a signal to people about what their predictions should be. When people are induced to attribute their anxiety to an external cause, they remain optimistic in their predictions. Accordingly, anxiety correlated with predictions in the control condition but not in the misattribution condition. In addition, attributing feelings of anxiety to the coffee corresponded to greater optimism in the misattribution condition but not the control condition. Finally, less optimism appears to be a consequence of greater anxiety rather than the reverse.

DISCUSSION

The present study replicated the effect of temporal proximity of feedback on outcome predictions. Participants in the control condition were less optimistic in their exam score predictions when they anticipated imminent feedback than when they believed that feedback was several days away. Our primary interest however was in the role anxiety plays in predictions. We provided some participants with an external explanation for any anxiety they experienced in response to impending test feedback. We reasoned that if anxiety can serve as a sig-

nal for predictions, then leading participants to misattribute their anxiety externally (to the coffee they consumed earlier) should eliminate the tendency to make lower predictions at the moment of truth. Consistent with our predictions, when led to misattribute their anxiety to the coffee, participants were just as optimistic in their exam score predictions in the immediate feedback condition as in the delayed feedback condition.

Two other findings confirmed the role of anxiety in predictions. First, among control participants, greater anxiety corresponded to lower predictions relative to performance. In contrast, among misattribution participants, anxiety and predictions were uncorrelated. Second, the more participants in the misattribution condition viewed the coffee as responsible for their anxiety, the more they were optimistic. By contrast, among control participants, the extent to which participants viewed the coffee as responsible for their anxiety was unrelated to optimism. These findings are consistent with the notion that anxiety serves as a signal for predictions. When the coffee provided a reasonable explanation for their anxiety, participants no longer relied on their anxiety as a signal for how they should adjust their predictions.

It is noteworthy that we found no evidence of pessimism in participants' predictions, whereas prior studies of exam scores reveal that people will err on the side of pessimism in their exam predictions in the moments prior to receiving their scores (e.g., Shepperd, Ouellette, et al., 1996). We suspect that the absence of pessimism resulted from participants' general unfamiliarity with the test. Moreover, we caution against overinterpreting the absolute level of responses. The more important finding is how the predictions compared across cells and not how they compared against actual test performance.

Exploring Alternative Models

We proposed that rising anxiety can signal participants to adjust their predictions downward. As such, anxiety can elicit pessimistic predictions. One could argue however that a third variable created by the anticipation of feedback, such as mental simulations of negative outcomes, produced both an increase in anxiety and a decrease in optimism. Accordingly, anxiety and optimism would be correlated but not causally related. The pattern of data however suggests otherwise. If participants' predictions merely resulted from mental simulations of negative outcomes, then participants would have shelved their optimism in both the control/immediate feedback condition and the misattribution/immediate feedback condition. After all, in both conditions participants received envelopes containing their feedback and

thus were just as likely to engage in mental simulations of negative outcomes. However, participants remained optimistic in their predictions when induced to attribute their anxiety to the coffee. We suspect that mental simulations of negative outcomes can eventuate in less optimistic predictions but only when people experience anxiety and interpret their anxiety as a signal to adjust their predictions.

We also explored the possibility that anxiety was a consequence rather than a cause of the decline in predictions. We believe it quite possible for doom and gloom predictions to increase anxiety. Indeed, anxiety and negative expectations may form a vicious circle whereby anxiety over a forthcoming outcome leads to a decline in optimism that in turn leads to greater anxiety and so on, with expectations spiraling downward and anxiety spiraling upward. Nevertheless, such a causal path cannot account for our results. Although participants anticipating immediate feedback reported greater optimism in the misattribution condition than in the control condition, they did not differ across conditions in their anxiety reports.

Implications

Anxiety has a bad rap because it is generally viewed as maladaptive. People who are excessively anxious are often labeled as *worrywarts*, a term with obscure origins from the 1930s (*Random House Webster's College Dictionary*, 1997) but used by workers in state mental hospitals in the 1950s to label patients who were overly anxious and pessimistic about the future (Belknap, 1956). The psychiatric community formalizes this sentiment by attaching the diagnostic label *generalized anxiety disorder* to people who express "excessive" worry and anxiety (American Psychiatric Association, 2000). Of course, too much anxiety can be problematic. It can lead to social exclusion (Helweg-Larsen, Sadeghian, & Webb, 2002) and can be distressing and personally debilitating. The present study nevertheless reveals that anxiety about the future, although problematic when excessive, can serve a function. It can serve as a signal for predictions.

The importance of this function should not be underestimated. How people feel about their outcomes depends to a large extent on their expectations (Mellers, Schwartz, Ho, & Ritov, 1997; Shepperd & McNulty, 2002). To the extent that people are overly optimistic in their expectations, they may be ill equipped to deal with bad news should it occur. Managing emotional reactions to bad news is challenging enough when people are prepared to receive it; it can be overwhelming when people are unprepared. Managing mood after unexpected bad news can demand a redirection of resources from other areas of life, leaving one ill equipped to deal with other life demands. When anticipating news about important

outcomes, people may be best served by a less optimistic outlook that although distressing prepares them to move forward should tragedy occur.

Although an optimistic outlook may characterize well-being and normal human functioning (S. E. Taylor & Brown, 1988), unwavering optimism does not always serve people well. By the same token, although a modicum of pessimism can be beneficial in that it takes away the surprise and thereby softens the blow of unexpected bad news, it is not the way people typically like to think about the future. And is it not the way people have to think about the future. For many events there is no imminent feedback waiting just around the corner to challenge a Pollyanna outlook. However, when a challenge looms on the horizon, as when people await the results of a medical test, the scores on an exam, or perhaps closer to home, the outcome of a promotion and tenure vote, people are likely to eschew their optimism in favor of realism or even pessimism in their thinking. Our findings reveal that anxiety can play an important role in the shift from optimism and suggests that the function of anxiety may be to alert people that more circumspect predictions are in order.

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