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Defensive Pessimism and Optimism: The Bitter-Sweet Influence of Mood on Performance and Prefactual and Counterfactual Thinking

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Three studies demonstrated that manipulated moods influence the prefactual (alternative preoutcome predictions) and counterfactual (alternative postoutcome "what might have beens") mental simulations of defensive pessimists and optimists. In Study 1, negative moods induced more upward (better than expected) prefactuals, and defensive pessimists performed best under such conditions; optimists performed best under induced positive moods, after which they used little prefactual thinking. In Studies 2 and 3, manipulated moods again influenced the strategies of defensive pessimists and optimists. In Study 2, optimists responded with more downward (worse than actuality) counterfactuals, suggesting attempts at mood repair. In Study 3, defensive pessimists and optimists each coped effectively by using preferred mental simulation strategies; both groups rebounded on a second task from poor performances on a first task.

INTRODUCTION

Mentally simulating alternative possible outcomes, both before and after an event, appear to be pervasive and ubiquitous human tendency. Contemplating an important business meeting with a valued client, tentatively preparing for an upcoming date, or anticipating the imminence of a golf match against a vaunted rival are but a few examples of common situations that can elicit simulations of alternative possible outcomes. Simulations before the fact, what might be called *prefactual* thoughts (Sanna, 1996), influence a variety of diverse responses such as affect, expectancies, and

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predictions (e.g. Hoch, 1985; Sanna, 1996; Sherman, Skov, Hervitz, & Stock, 1981; Taylor & Schneider, 1989). Simulations after the fact, or *counterfactual* thoughts, influence such things as affective reactions (Gleicher et al., 1990; Johnson, 1986; Landman, 1987), accident and victim compensation (Macrae & Milne, 1992; Miller & McFarland, 1986; Turley, Sanna, & Reiter, 1995), and causal ascriptions (Gavanski & Wells, 1989; Wells & Gavanski, 1989; Wells, Taylor, & Turtle, 1987; e.g. see Roese & Olson, 1995, for reveiws).

The present studies examine the effects of moods on individual differences in prefactual and counterfactual thinking. Defensive pessimists and optimists exhibit diverse strategies when coping with life events (e.g. Cantor & Norem, 1989; Norem & Illingworth, 1993; Showers, 1992). Sanna (1996) found that defensive pessimists use more *upward prefactual* thoughts, whereas optimists use more *downward counterfactual* thoughts. Upward prefactuals are alternative preoutcome simulations that are better than expected (e.g. ''If only I had more study time, I could do better on tomorrow's exam''); downward counterfactuals are alternative postoutcome simulations that are worse than actuality (e.g. ''At least I bought the study guide, or my grade might have been worse''). *Downward prefactuals* (e.g. ''At least I have some study time, or I could fail tomorrow's exam'') and *upward counterfactuals* (e.g. ''If only I had bought the study guide, my grade might have been better'') also depend on the timing and direction of simulations (Sanna, 1996). Research has viewed moods as a reaction to simulation direction (see also Markman, Gavanski, Sherman, & McMullen, 1993; Roese, 1994). However, Sanna, Turley-Ames, and Meier (1998) have shown that moods can further serve as input to simulation direction, reversing the causal influence of simulation direction on moods. Positive and negative moods, manipulated directly and independently, may thus differentially influence the mental simulations and performances of defensive pessimists and optimists.

Prefactual and Counterfactual Thoughts of Defensive Pessimists and Optimists

Defensive pessimists benefit from adopting a negative outlook for upcoming performances (e.g. Norem & Cantor, 1986a; Norem & Illingworth, 1993; Showers, 1992). These persons acknowledge a past history of success in situations, such as academic or social settings, but they nevertheless enter those situations ''expecting the worst'' (Showers, 1992, p. 474). Their pessimism is viewed as strategic and serves at least two goals: (1) a self-protective goal of preparing for possible failure; and (2) a motivational goal of increasing effort and preparation in order to enhance the prospect of doing well (Showers & Ruben, 1990). Setting low expectations is a

hallmark of defensive pessimism and serves a self-protective goal, whereas setting low standards serves a motivational goal by harnessing anxiety or negative affect about possible failure (Norem & Cantor, 1986b). One of the main ways that defensive pessimists and optimists differ is in their use of anticipatory versus retrospective strategies. Defensive pessimists use anticipatory strategies, such as setting low expectations or playing through possible outcomes, *before* entering a performance situation; in contrast, optimists use retrospective strategies, such as cognitively restructuring the performance situation *after* outcomes are already known (e.g. by using ''self-serving biases''; Norem & Cantor, 1986a; Showers, 1992). The two strategy groups thus diverge in the timing of their strategy usage.

Defensive pessimists and optimists can each effectively use their preferred strategies. However, when the use of preferred strategy is unavailable, or is not possible, then performance suffers. For example, Norem and Illingworth (1993) proposed that a ''thinking through'' process is important to the defensive pessimist's strategy. People using the strategy set low expectations and think about worst-case scenarios as they anticipate upcoming performances, which helps them to harness anxiety and plan effective behaviour. These ideas were supported in two studies which used a mathematics test and experience sampling methodology. Importantly, defensive pessimists' low expectations did not become self-fulfilling; they performed as well as their optimistic peers despite their lower expectations and higher anxiety. However, when the possibility of thinking through was interfered with, performance suffered for defensive pessimists but not for optimists (for whom not thinking through may be the default strategy; Norem & Illingworth, 1993; see also Spencer & Norem, 1996). In a similar fashion, Showers (1992) found that defensive pessimists performed better in a negative focus condition than in a positive focus condition, but that focus had no effect on the performances of optimists.

As further evidence of strategy differences, Sanna (1996) has shown that defensive pessimists and optimists diverge in the timing and direction of their mental simulations. The prospective preparation of defensive pessimists is served by upward comparisons or thoughts, or upward prefactuals, whereas the retrospective affect repair of optimists is served by downward comparisons or thoughts, or downward counterfactuals. These proposals were supported in research using a variety of situations ranging from real-life examination performances to laboratory anagram tasks. That defensive pessimists set low expectations before performance is also consistent with notions that, by contrast, alternative expected performance outcomes are likely to be upward and with the experience of high anxiety and negative moods. After performances, however, optimists are more likely to use downward counterfactuals to maintain or restore positive moods, which is consistent with notions of cognitive restructuring. In short, defensive

pessimists use a variety of strategies that lower expectations and increase negative moods before performing, including upward prefactuals, but they do not engage in many retrospective strategies. Optimists, in contrast, do not use many anticipatory strategies, but employ downward counterfactuals after performances to maintain or restore positive moods.

Moods as Consequences and Antecedents of Prefactual and Counterfactual Direction

Research demonstrates that people's affective reactions can diverge depending on counterfactual direction (e.g. Markman et al., 1993; Roese, 1994; Sanna, 1996; cf. Sanna, 1997). By way of contrast (e.g. Schwarz & Bless, 1992), downward counterfactuals, simulated alternatives that are worse than actuality elicit positive moods, whereas upward counterfactuals, simulated alternatives that are better than actuality elicit negative moods. For example, Markman el al.'s (1993) participants played a computer-simulated blackjack game and generated a higher proportion of upward counterfactuals after failure (losing), and when the game was repeatable. Failures and repeatability elicited not only more upward counterfactuals but also greater dissatisfaction. Importantly, the relation between counterfactual direction and satisfaction remained significant even when the two manipulated variables were statistically controlled, suggesting a causal linkage between direction and affect (Markman et al., 1993). Adding to this, Roese (1994) found that participants who were induced to generate downward counterfactuals subsequently reported more positive moods than those who were asked to generate upward counterfactuals, and Sanna (1996) found that naturally occurring negative and positive moods were related to upward and downward mental simulations, respectively.

Although there is little denying the influence of simulation direction on moods, there are several converging reasons to expect that moods may also influence simulation direction. A large body of literature suggests that people's evaluative judgements, problem-solving strategies, and task performances are all influenced by pre-existing affective states (see Schwarz & Clore, 1996, for a review). This seems particularly likely for mental simulations. For example, negative moods may make accessible negative self-thoughts, whereas positive moods may make accessible positive self-thoughts (e.g. Bower, 1991; McMullen, Markman, & Gavanski, 1995; Sedikides, 1992). Once negative self-thoughts are accessed, the most likely simulated alternatives would be better, or upward pre- or counterfactuals. Conversely, once positive self-thoughts are accessed, simulated alternatives are likely to be worse, or downward pre- or counterfactuals. In a related way, moods may serve as input or information (Martin, Ward,

Achee, & Wyer, 1993; Sanna, Turley, & Mark, 1996; Schwarz, 1990) to mental simulations. For example, people may ask themselves "How do I feel about it?" with reference to their current life circumstances. People may then construe their bad moods as meaning they have not reached set goals (or they are unsuccessful), whereas people may construe good moods as meaning they have reached set goals (or they are successful). Negative moods may also induce high goal standards and positive moods may induce low goal standards (Cervone, Kopp, Schaumann, & Scott, 1994). The common net effect of these lines of evidence, translated into mental simulation terms, is that negative moods should induce thinking about things better or higher than actuality—or upward pre- or counterfactuals—whereas positive moods should induce thinking about things worse or lower than actuality—or downward pre- or counterfactuals.

Direct evidence for the proposal that moods can influence the direction of simulation was provided by Sanna et al. (1998). In a series of studies, moods were directly and independently manipulated using a series of film clips or music. Participants were then asked to generate counterfactuals in reaction to scenarios and to actual recalled life events. More upward counterfactuals were generated when in negative moods, whereas more downward counterfactuals were generated when in positive moods. In addition, agreement to already provided counterfactual statements after performing laboratory anagram tasks was similarly influenced by moods. In other words, just as downward counterfactuals led to positive moods and upward counterfactuals led to negative moods in prior research (Markman et al., 1993; Roese, 1994; Sanna, 1996), positive moods led to downward counterfactuals and negative moods led to upward counterfactuals. That moods can also serve as antecedents to counterfactual direction reverses the typical causal influence of counterfactual direction on moods. Because moods can influence simulation direction in this way, it is presently argued that this may therefore have particularly intriguing implications for affecting the mental simulation strategies of defensive pessimists and optimists.

THE PRESENT RESEARCH

To summarise, the purpose of the present research was to examine the extent to which positive and negative moods, manipulated directly and independently, would differentially influence the mental simulations and subsequent performances of defensive pessimists and optimists. Prior research has shown that defensive pessimists use more upward prefactual thoughts than optimists, whereas optimists use more downward counterfactual thoughts than defensive pessimists (Sanna, 1996). Upward prefactuals are associated with negative moods for defensive pessimists, and

downward counterfactuals are associated with positive moods for optimists. Although researchers have viewed moods primarily as consequences of simulation direction (e.g. Markman et al., 1993; Roese, 1994; Sanna, 1996), recent research has shown that moods may also serve as antecedents to simulation direction (Sanna et al., 1998), reversing the typically studied influence of simulation direction on moods. The possibility that moods can affect mental simulations thus has especially intriguing implications for understanding the strategies, and potential performance consequences, of defensive pessimists and optimists.

It is therefore hypothesised that directly and independently manipulated moods may markedly influence the mental simulations, and subsequent performances, of defensive pessimists and optimists. In particular, each strategy group should perform best under mood conditions that best facilitates its use of preferred strategies. For example, manipulated positive moods may impair the performances of defensive pessimists because positive moods would induce them to generate downward prefactuals, but their preferred strategy is to generate upward prefactuals. In contrast, manipulated negative moods may not influence, or may actually improve, defensive pessimists' performances because being in a negative mood before performing is part of their preferred anticipatory strategy, and would thus induce them to generate upward prefactuals. The influence of moods on optimists' performances may be particularly enlightening. Although predictions are more tentative, on the basis of previous research, optimists may perform best when mood is not directly induced, as their preferred strategy appears to be no prefactual thinking, and either upward or downward prefactuals may have an impairing effect for optimists. Assessing the influence of moods on mental simulations thus not only may increase what is known about defensively pessimistic and optimistic strategies, but may also further an understanding of the relationship between moods, mental simulations, and performances more generally.

STUDY 1: MOOD AND PREFACTUAL STRATEGIES

In an initial test of these ideas, positive and negative moods were manipulated directly and independently using a series of film clips. Participants were then asked to generate prefactual thoughts before performing an anagram task. Defensive pessimists and optimists were characterised on the basis of their scores on the Defensive Pessimism Questionnaire (DPQ; e.g. Norem & Cantor, 1986a). A control, no mood induction, condition was also included in Study 1 in order to permit appropriate comparisons with prior defensive pessimism and optimism research, in which moods have not been directly manipulated before task performance. The design of Study 1 was a 2 (strategy: defensive pessimist, optimist) $\times$ 3 (mood:

positive, negative, control) between-subjects factorial. On the basis of the foregoing arguments, it was predicted that defensive pessimists would perform best in the negative and control mood conditions, as in both conditions they should use their preferred upward-prefactual strategy. In contrast, defensive pessimists should perform worst in the positive mood condition, because positive moods would induce them to generate downward prefactuals, a nonpreferred strategy. Although predictions for optimists were more tentative, on the basis of the results of prior research, it seemed that optimists may perform best in the control mood condition. Either manipulated positive or negative moods might impair optimists' performances because these moods may induce them to generate downward and upward prefactuals, respectively, but no prefactual thinking is part of their preferred strategy.

Method

Participants

Participants were 45 male and 37 female introductory psychology students who were recruited by telephone on the basis of their scores on the DPQ. The DPQ was administered to 291 students at the beginning of the semester as part of a mass survey session. Forty-two defensive pessimists (24 males and 18 females) and 40 optimists (21 males and 19 females) participated.

DPQ. The DPQ (e.g. Norem & Cantor, 1986a; Norem & Illingworth, 1993) is a 9-item measure that assesses a person's propensity to use defensively pessimistic or optimistic strategies in academic achievement situations. Four questions represent a defensively pessimistic orientation (e.g. "I generally go into academic situations with low expectations, even though I know things usually turn out all right"), and four questions represent an optimistic orientation (e.g. "I often think about what it will be like if I do very well in an academic situation"). Scores on the DPQ are computed by subtracting the sum of a person's endorsements for the pessimistic items from the sum of endorsements for the optimistic items. Persons who scored within the upper (optimist) or lower (defensive pessimist) thirds of the distribution, and who strongly endorsed an additional item ("I have generally done well in academic situations in the past" with a score of 7 or greater on a 9-point scale), were eligible for recruitment. The DPQ is internally consistent (Cronbach's αs .64 to .85) and temporally stable [test-retest $r(67) = .73$; see Norem & Illingworth, 1993], and has shown good predictive utility (e.g. Cantor & Norem, 1989; Cozzarelli &

Major, 1990; Norem & Cantor, 1986a; Sanna, 1996; Spencer & Norem, 1996).

Procedure

Participants were tested individually. A cover story indicated that the experiment involved a set of unrelated activities that included rating movies and other tasks being tested for possible use in future research. The experimenter who tested participants was unaware of their strategy assignment.

Mood Induction. To induce moods, participants watched and rated clips from three films (Martin et al., 1993; Sanna et al., 1996). In the *positive* mood condition, participants watched humorous clips from the films *Splash* and *Stripes*; in the *negative* mood condition, participants watched sad clips from the films *Gallipoli* and *Sophie's Choice*. Preceding these clips, participants watched a clip of a car chase scene from the movie *Bullit*; it was included to draw participants' attention away from the overall emotional tone of the film clips, thus lessening the chances they would guess that the clips were designed to influence their moods. Together, the series of film clips lasted about 20 minutes. After each clip, participants responded to surveys titled "Pilot Movie Ratings", which asked for routine ratings of the film clips (e.g. whether they had seen the movie before or knew the movie's title; see Sanna et al., 1996). In addition, a no mood induction, *control* condition, was included, in which no film clips were shown. Instead, participants were told that there was some trouble with the video equipment, so the movies would be skipped in the session; these participants were told they would still be able to complete the other parts of the session that did not involve the movie ratings.

After viewing and rating the last film clip, as a manipulation check, participants indicated the extent to which a series of positive and negative adjectives reflected their current feelings (cf. Watson, 1988). The positive mood adjectives were *happy*, *satisfied*, *pleased*, *delighted*, *content*, *relieved*, and *glad*; the negative mood adjectives were *gloomy*, *annoyed*, *depressed*, *miserable*, *sad*, *disappointed*, and *frustrated*. Each of the mood ratings were made on 9-point scales anchored by 1 (*not at all*) and 9 (*very much*). Participants in the control mood condition also completed the mood-adjective ratings.

Once mood ratings were completed, participants were told about another task that was (ostensibly) being tested for future research. To supposedly test for "people's representations of environments", the experimenter allowed participants 1 minute to draw a map of their university campus. Following Martin et al. (1993; see also Sanna et al., 1996), the

actual purpose of this task was to create a brief time interval between participants' mood ratings and the task of main interest (described next), because a few studies suggested that participants might discount their moods as a basis for behaviours if they are rated immediately before the task of interest (see Berkowitz & Trocolli, 1990).

Anagram Task. All participants performed an anagram task, with instructions that were provided by computer. They read that anagrams were scrambled word problems, and that solving them meant unscrambling the letters to form an actual word. For example, participants read, "'YHAPP' is an anagram, and its solution is 'HAPPY'". It was emphasised that all anagrams had only one correct solution. If they could not solve an anagram, participants were instructed to move on to the next one and then to come back to it later. They also read that they could work on the anagram items in any order that they chose. The anagrams were described as a particularly important index of ability and aptitude.

All participants worked on a set of 20 anagrams that were selected from Gilhooly and Johnson (1978). The anagrams were of intermediate difficulty, with solution scores (the number out of 45 participants who correctly solved the item) between 17 and 26 (see Gilhooly & Johnson, 1978). The 20 anagrams were numbered and were all presented together on the computer screen, while participants recorded their answers on a corresponding response sheet. Participants were allowed 9 minutes to work on the complete set of 20 anagrams (see Sanna, 1996). Prior to beginning the task, participants also made a series of (bogus) choices regarding the format of their anagrams, including topic, list, test length, time, and possibility of buying clues (see Sanna & Turley, 1996).

Prefactual Thoughts. Prior to performing the anagram task, participants were given a page entitled "Performance Description", and were asked to write about their upcoming performance. On this page, all participants read that they should first take 3 minutes to think about their upcoming performance on the anagram task. Participants next read the following instructions:

> People often have thoughts like "if only" or "what if" when thinking about upcoming anagram performances. Sometimes these thoughts can be about things that are better than what they expect will actually happen, and sometimes these thoughts can be about things that are worse than what they expect will actually happen. For example, if only I could have more time to prepare, or what if I perform better than expected, are thoughts that someone might have. In the spaces below, please describe alternatives that are worse or better

than what you expect will actually happen that might affect your upcoming performance on the anagram task.

These instructions and open-ended response format were adapted from that used successfully in previous research (Sanna, 1996), and allows participants to write about any antecedents or consequences that they could think of and to record as many prefactual thoughts as they desired.

Participants themselves then coded the direction of their prefactual simulations. They read that they should go back to the alternatives that they had listed earlier in their performance descriptions and mark a plus sign beside statements that describe things that are *better* than what they expected would actually happen and a minus sign beside statements that are *worse* than what they expected would actually happen (Sanna, 1996; see also Roese & Olson, 1995; Sanna & Turley, 1996).

Results and Discussion

Manipulation Check

Ratings of the negative mood adjectives were reverse scored and averaged with those of the positive mood adjectives (Cronbach's $\alpha = .89$). A 2 (strategy) $\times$ 3 (mood) analysis of variance (ANOVA) revealed main effects for strategy [$F(1, 76) = 4.93$, $P < .05$] and mood [$F(2, 76) = 19.32$, $P < .001$].[1] Perhaps not surprisingly, optimists ($M = 4.96$) felt better than defensive pessimists ($M = 4.03$). Importantly, irrespective of strategy, planned contrasts (Rosenthal & Rosnow, 1985) indicated that participants who watched the happy films ($M = 6.16$) felt better than those who watched the sad films [$M = 2.96$; $t(76) = 5.73$, $P < .01$]; in addition, control mood participants ($M = 4.37$), who did not watch any films, fell between and differed from both positive and negative mood participants, both $t(76)$s > 2.72, Ps $< .01$. These findings indicate that the mood manipulations were effective in inducing the intended moods.

The means in Table 1 further illuminate participants' moods. Defensive pessimists who watched happy films felt better than those who watched sad films or no films, both $r(76)$s > 4.05, Ps $< .01$; whereas defensive pessimists who watched sad films felt worse than those who did not watch any films, the sad and no film conditions did not differ from each other. Optimists, in contrast, felt worse after watching the sad films than after watching happy or no films, both $t(76)$s > 3.53, Ps $< .01$; whereas optimists who watched

[1] In each study reported in this article, ANOVAs were also conducted which included sex of participant as an additional variable. There were no effects of participants' sex in any of the studies and, consequently, it is not further discussed in this article.

TABLE 1
Mean Mood Manipulation Check, Upward and Downward Prefactuals, and Anagram Performance by Strategy and Mood for Study 1

	Defensive Pessimist			*Optimist*		
Variable	*Positive*	*Negative*	*Control*	*Positive*	*Negative*	*Control*
Mood check	6.01	2.93	3.15	6.30	3.00	5.59
Upward prefactuals	1.00	3.29	2.89	0.84	3.03	0.59
Downward prefactuals	2.90	0.52	0.63	0.99	1.11	0.60
Anagram performance	8.89	15.05	13.95	12.94	9.10	13.88

the happy films felt better than those who did not watch any films, the happy and no film conditions did not differ from each other. Further implications of these findings are discussed later.

Prefactual Thoughts

Prefactual thoughts were subjected to a 2 (strategy) × 3 (mood) × 2 (prefactual: upward, downward) ANOVA, with prefactual as a within-subject variable. Participants were adept at generating and coding upward (e.g. "If only I can have more time to practise the anagrams, I'll perform better") and downward (e.g. "At least I like doing word tasks, or I think I'd do really poorly") prefactuals. There were main effects for strategy [$F(1, 76) = 5.31$, $P < .05$], (defensive pessimist, $M = 1.87$; optimist, $M = 1.57$) and prefactual [$F(1, 76) = 7.67$, $P < .01$] (upward, $M = 2.00$; downward, $M = 1.44$).

Consistent with research demonstrating that moods can influence counterfactual direction (Sanna et al., 1998), but extending results to prefactual direction, there was a Mood × Prefactual interaction [$F(2, 76) = 11.20$, $P < .01$]. More downward ($M = 2.92$) than upward ($M = 1.09$) prefactuals were generated after induced positive mood [$t(76) = 3.66$, $P < .01$] and more upward ($M = 3.16$) than downward ($M = 0.81$) prefactuals were generated after induced negative mood [$t(76) = 4.85$, $P < .01$].

These effects, however, were additionally qualified by the three-way interaction [$F(2, 76) = 4.04$, $P < .05$] presented in Table 1. As predicted, defensive pessimists put into negative moods generated more upward than downward prefactuals, whereas those put into positive moods generated more downward than upward prefactuals, both $t(76)$s > 3.90, Ps < .01. In the control mood condition, defensive pessimists generated more upward than downward prefactuals [$t(76) = 4.59$, $P < .01$]. For optimists, more upward than downward prefactuals were also generated when they were put into negative moods [$t(76) = 3.93$, $P < .01$]. The number of upward and

downward prefactuals did not differ for optimists within either the positive or control mood conditions.

Anagram Performance

A 2 (strategy) × 3 (mood) ANOVA on the number of correctly answered anagram items revealed only a Strategy × Mood interaction [$F(2, 76) = 6.99$, $P < .01$], (see Table 1). As predicted, defensive pessimists correctly answered fewer anagram items when in positive moods than when in either negative or control moods, both $t(76)$s > 2.76, Ps < 01; whereas the latter two conditions did not differ from each other. In contrast, optimists correctly answered fewer anagram items when in negative moods than when in positive or control moods [$t(76)$s > 2.00, $P < .05$]; whereas the latter two conditions did not differ from each other. In addition, defensive pessimists correctly answered fewer anagram items than optimists in the positive mood condition, whereas optimists correctly answered fewer anagram items than defensive pessimists in the negative mood condition, both $t(76)$s > 2.15, Ps < .05.

Defensive pessimists performed worst in the induced positive mood condition. It was also in the positive mood condition that defensive pessimists generated more downward than upward prefactuals, which is counter to their preferred upward prefactual strategy. Induced negative moods, however, were consistent with defensive pessimists' use of their preferred upward prefactual strategy; they generated more upward than downward prefactuals and performed at a level equivalent to controls (who had default preperformance negative moods). Optimists, in contrast, did not fare well when negative moods were induced; they generated large numbers of upward prefactual thoughts, a nonpreferred stategy for them. Optimists in the control mood condition did not generate many upward or downward prefactuals, which is consistent with arguments that their preferred strategy does not seem to involve prefactual thinking. Interestingly, optimists also did not engage in much prefactual thinking even when put into positive moods (which is their default preperformance mood anyway), indicating that positive moods did not influence them by producing more upward prefactuals as it did for defensive pessimists.

To explore further these findings, some correlational analyses were conducted. The mean number of downward prefactuals was subtracted from the mean number of upward prefactuals generated by each participant. This index was then correlated with anagram performances separately for defensive pessimists and optimists within each mood condition. Across mood conditions, defensive pessimists' performances were significantly related to their prefactual thoughts [$r(13–15)$s > .57, Ps < .05]. As

the relative number of upward prefactuals increased, so did anagram performances (conversely, performances decreased with decreases in the relative number of upward prefactuals). For optimists, however, anagram performance was related to prefactuals only in the negative mood condition, and this relationship was negative [$r(14) = -.60$, $P < .05$]. As the relative number of upward prefactuals increased, anagram performances decreased. Prefactual thoughts were not related to performances for optimists in the other two mood conditions. These analyses further suggest that defensive pessimists may be better able, or are more willing, to use upward prefactual thoughts, and their performances suffer when they are inhibited from using them like when they are in induced positive moods. In contrast, optimists' performances suffer when they are induced to generate upward prefactuals, as when they are put into negative moods.

STUDY 2: PERFORMANCE AND COUNTERFACTUAL STRATEGIES

The results of Study 1 provided initial evidence that directly and independently manipulated moods influence the prefactual strategies of defensive pessimists and optimists, and this may have markedly different performance consequences for the two groups. A second study was conducted to address four issues. First, prefactuals were directly solicited in Study 1. Although it has been common to prompt for thoughts in past research, one might argue that moods influenced the strategies and performances of defensive pessimists and optimists *only* because they were explicitly asked to generate prefactuals. Study 2 tested for mood influences on defensive pessimists and optimists when they are not prompted for any thoughts before performing. Second, Study 2 assesses counterfactual (post-performance) simulations. Optimists are likely to engage in downward counterfactual thinking to restore positive moods (Sanna, 1996), consistent with arguments that they engage in more attributional egotism (e.g. Alloy & Abramson, 1979; Snyder, Stephan, & Rosenfield, 1978) than do defensive pessimists. Unfortunately, counterfactuals were not measured in Study 1 (in which the focus was on prefactuals). Related to this, a third purpose of Study 2 was to assess the effects of counterfactuals on subsequent moods. For example, if optimists generate downward counterfactuals to mood repair, then one might expect improved moods after generating downward counterfactuals. A final purpose of Study 2 was to use an alternative manipulation of moods, allowing a further test of the generality of Study 1. Study 2 employed a 2 (strategy) $\times$ 3 (mood) between-subjects factorial, as did Study 1; however, different measures and manipulations were used in a different sequence for reasons outlined in the foregoing.

Method

Participants

Participants were 30 defensive pessimists (13 men and 17 women) and 30 optimists (14 men and 16 women) who were recruited from the upper and lower thirds of an initial introductory psychology pool of 381 in a manner similar to that used in Study 1. The experimenter who tested participants was unaware of their strategy assignment.

Procedure

Procedures were similar to those of Study 1, but there were some exceptions. First, although a cover story described a series of unrelated activities, there was a change in the cover story of Study 2 referring to ''rating music'' rather than to rating movies.

Mood Induction. Second, a pair of music selections were used to induce moods in Study 2. In the *positive* mood condition, participants listened to upbeat selections from Mozart's *Eine Kleine Nachtmusik*; in the *negative* mood condition, participants listened to a moribund selection, Prokofiev's *Russia Under the Mongolian Yoke*, played at half speed (see Dykman, 1996, 1997). Participants listened to the music on cassette tapes over private headsets. Each tape lasted approximately 10 minutes. After listening to the music, participants responded to a survey titled ''Pilot Music Ratings'', which asked for routine ratings of the music similar to that used for films in Study 1. Participants in the *control* mood condition did not listen to any tapes. Once participants made music ratings, they indicated the extent to which a series of positive and negative adjectives reflected their current feelings, identical to that of Study 1. Control mood participants also made mood ratings. Participants then performed the map-drawing task for 1 minute.

Anagram Task. The anagram task was identical to that used in Study 1.

Counterfactual Thoughts. Third, after performing the anagram task, participants were instructed to generate counterfactuals. Instructions were virtually identical to those used for prefactuals in Study 1, but were modified to refer to counterfactuals. Also virtually identical to Study 1, participants coded their own counterfactual direction.

Post-mood. Fourth and finally, to assess moods after counterfactual generation, participants responded to the series of positive and negative mood adjectives for a second time.

Results and Discussion

Manipulation Check

Responses to the mood adjectives were appropriately reverse scored and averaged (Cronbach's α = .93) as in Study 1. A 2 (strategy) × 3 (mood) ANOVA revealed a strategy main effect [$F(1, 54) = 4.11$, $P < .05$], (defensive pessimist, $M = 4.09$; optimist, $M = 5.04$), and a main effect for mood [$F(2, 54) = 17.89$, $P < .001$]. Importantly, irrespective of strategy, participants in the positive mood condition ($M = 6.35$) felt better than those in the negative mood condition [$M = 2.99$; $t(54) = 5.20$, $P < .01$]; whereas participants in the control mood condition ($M = 4.36$) fell between and differed from each other group, both $t(54)$s > 2.41, Ps < .05. The musical mood manipulations were thus effective in inducing the intended moods.

As in Study 1, an inspection of the means within each condition further delineates participants' moods (see Table 2). Defensive pessimists who listened to positive music felt better than those who listened to negative or no music, both $t(54)$s > 3.87, Ps < .01; whereas defensive pessimists who listened to negative music felt worse than those who did not listen to music, the negative and no music conditions did not differ from each other. Optimists, in contrast, felt worse after listening to negative music than after listening to positive or no music, both $t(54)$s > 3.22, Ps < .01; whereas optimists who listened to positive music felt better than those who did not listen to music, the positive- and no-music conditions did not differ from each other. Once again, further implications of these findings are discussed later.

Anagram Performance

The number of correctly answered anagram items was submitted to a 2 (strategy) × 3 (mood) ANOVA and revealed only a Strategy × Mood interaction [$F(2, 54) = 4.87$, $P < .05$], (see Table 2). As predicted, and consistent with the results of Study 1, defensive pessimists correctly

TABLE 2
Mean Mood Manipulation Check, Anagram Performance, Upward and Downward Counterfactuals, and Post-mood by Strategy and Mood for Study 2

	Defensive Pessimist			*Optimist*		
Variable	*Positive*	*Negative*	*Control*	*Positive*	*Negative*	*Control*
Mood check	6.23	2.95	3.11	6.48	3.03	5.62
Anagram performance	9.14	13.72	13.08	13.37	8.89	13.40
Upward counterfactuals	5.15	2.00	2.27	2.51	1.52	1.63
Downward counterfactuals	1.12	2.09	2.05	4.23	5.29	4.74
Post-mood	3.55	6.17	6.00	6.00	6.09	5.93

answered fewer anagram items when in positive moods than when in either negative or control moods, both $t(54)$s > 2.09, Ps < .05; whereas the latter two conditions did not differ from each other. In contrast, optimists correctly answered fewer anagram items when in negative moods than when in positive or control moods [$t(54)$s > 2.17, P < .05], but the latter two conditions did not differ from each other.

Defensive pessimists also correctly answered fewer anagram items than optimists when in positive moods, whereas optimists correctly answered fewer anagram items than defensive pessimists when in negative moods, both $t(54)$s > 2.05, Ps < .05. The performances of defensive pessimists and optimists did not differ from each other in the control mood condition, suggesting that both groups can successfully implement preferred strategies when not put into moods that are counter to their usual preperformance affective state.

Counterfactual Thoughts

Participants were adept at generating and coding upward (e.g. "I might have performed better on the anagrams, if only I wasn't so tired") and downward (e.g. "At least I like doing these types of things, or it could have been worse") counterfactuals. A 2 (strategy) × 3 (mood) × 2 (counterfactual: upward, downward) ANOVA, with counterfactual as a within-subjects variable, revealed Strategy × Counterfactual [$F(1, 54) = 16.29$, P < .001] and Mood × Counterfactual [$F(2, 54) = 5.34$, P < .01] interactions. Most importantly, although the three-way interaction was not significant, planned contrasts of the means within each condition further illuminates participants' counterfactual thoughts (see Table 2). Optimists generated more downward than upward counterfactuals across all mood conditions, all $t(54)$s > 2.04, Ps < .05. These findings are consistent with arguments that downward counterfactuals may be part of the optimists' strategy (Sanna, 1996), and with research that more generally suggests that optimists may engage in self-serving retrospective strategies (e.g. Norem & Cantor, 1986a; Norem & Illingworth, 1993; Showers, 1992).[2]

[2] It is worth noting that participants in Study 2 were asked to generate counterfactuals *after* they performed the anagram task. These procedures are different from research in which participants generated counterfactuals as a direct response to moods; that is, participants were not asked to generate counterfactuals right after mood manipulations in Study 2 as they were in prior research (Sanna et al., 1998). Negative moods may induce more upward counterfactual thinking, and positive moods may induce more downward counterfactual thinking. The results of Study 1 also indicated that the same may apply to mood influences on prefactual thoughts. However, the purpose of Study 2 was to assess the counterfactual strategies of defensive pessimists and optimists after their performances were previously influenced by mood (Study 1 indicated, of course, that performance effects may have been due at least in part to mood influences on the prefactual strategies of defensive pessimists and optimists). In this way, Study 2 attempted to explicate further the counterfactual tactics of these two strategy groups.

For defensive pessimists, the number of upward and downward counterfactuals did not differ from each other within the negative and control mood conditions. These findings are consistent with research that indicates defensive pessimists do not use counterfactual thoughts in particular (Sanna, 1996), and retrospective strategies in general (e.g. Norem & Illingworth, 1993), as part of their normal strategies. However, defensive pessimists did generate more upward than downward counterfactuals in the positive mood condition [$t(54) = 4.79$, $P < .01$]; they also performed most poorly in that condition, as described previously. One possibility is that, when in a positive mood, defensive pessimists attempt to use their preferred upward prefactual strategy (see Study 1) retrospectively, which may have resulted in ''ruminations'' (e.g. Nolen-Hoeksema, 1991; Nolen-Hoeksema, Parker, & Larson, 1994) over what might have been better after it is too late. It is noteworthy that similar findings have been obtained when defensive pessimists could not use an upward prefactual strategy because they were forced to consider downward prefactuals before performing (Sanna, 1996).

Post-mood

A final purpose of Study 2 was to examine the effects of defensive pessimists' and optimists' counterfactual generation on subsequent moods. The post-mood index was appropriately reversed-scored and averaged (Cronbach's $\alpha = .79$). A 2 (strategy) $\times$ 3 (mood) ANOVA revealed a main effect for mood [$F(2, 54) = 4.22$, $P < .05$] and a Strategy $\times$ Mood interaction [$F(2, 54) = 4.11$, $P < .05$], (see Table 2). Planned contrasts indicated the only significant difference was that defensive pessimists' in the positive mood condition felt *worse* than did participants in all other conditions, all $t(54)$s > 2.77, Ps $< .05$. In other words, the post-moods of optimists did not differ from each other. This was true even when optimists performed most poorly, in the negative mood condition; of course, they also generated more downward than upward counterfactuals in this condition. That optimists' post-moods were positive, even after a poor performance, is tentative evidence that downward counterfactuals are mood repairing and mood maintaining for optimists (see also Sanna, 1996). In contrast, defensive pessimists felt good only after they performed well (in the negative and control mood conditions). Ironically, defensive pessimists felt worst in the positive mood condition; however, it was of course in this condition that they also performed worst and generated more upward than downward counterfactuals.

To explore further these findings, anagram performances were regressed on post-moods separately for defensive pessimist and optimist groups for each mood condition. Within each mood condition, defensive pessimists' performances were significantly related to post-moods, all βs $> .63$, Ps $<$

.05, and the same was true within each mood condition for optimists, all βs > .58, *P*s < .05. The number of upward counterfactuals was subtracted from the number of downward counterfactuals, and this index of counterfactual direction was then entered into the analysis as a covariate. When this was done, the relationship between performance and post-mood dropped to nonsignificance for optimists across all mood conditions, all βs < .19, *P*s > .43. However, the relationship between performance and post-mood remained significant for defensive pessimists in the negative and control mood conditions, both βs > .64, *P*s < .05. Only in the positive mood condition did the relationship between performance and post-affect drop to nonsignificance for defensive pessimists, $\beta = .15$, $P > .62$.

The pattern of performance and mood were identical to that found in Study 1. Given that two completely different mood manipulations were used in the two studies, and given that these manipulations have been shown to induce successfully positive and negative moods in previous research, it is perhaps the case that induced positive moods have less influence on optimists and induced negative moods have less influence on defensive pessimists.[3] Nevertheless, negative moods did impair the performances of optimists, and positive moods did impair the performances of defensive pessimists. The regression analyses further suggest that optimists may use downward counterfactuals more often than defensive pessimists to alleviate negative moods. In fact, defensive pessimists' counterfactuals were related to post-moods only after they performed poorly (in the positive mood condition), in which case they generated more upward than downward counterfactual thoughts and felt worst.[4]

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[3] It may be that optimists assimilate positive moods (as it is "closer" to their normal or default preperformance mood), whereas defensive pessimists assimilate induced negative moods (as it is closer to their normal preperformance mood). Although this possibility is only speculative, the effects of assimilation and contrast on mental simulations (cf. McMullen, 1997), and the possible role of mood and individual differences, would itself seem like an interesting additional area for future research.

[4] A 2 (strategy) × 3 (mood) × 2 (time: mood check, post-mood) ANOVA was also conducted, to test whether participants' moods changed over time. To do this, the mood manipulation check (first row of Table 2) was used as an initial "pre" mood measure, and the post-mood index (last row of Table 2) was used as the "post" mood measure, constituting a within-subjects variable. This analysis revealed main effects for strategy [$F(1, 54) = 5.98$, $P < .01$] and time [$F(1, 54) = 9.04$, $P < .01$]. There also was a Mood × Time [$F(2, 54) = 15.74$, $P < .001$] and three-way [$F(2, 54) = 3.88$, $P < .01$] interaction. Comparisons between the mood measures in the first and last rows of Table 2 indicated that optimists' moods improved over time in the negative mood condition [$t(54) = 3.56$, $P < .01$], whereas the moods of optimists remained high (and did not differ) across time in the other two mood conditions. In contrast, defensive pessimists' moods changed across time in all conditions [$t(54)$s > 3.12, *P*s < .01]. However, in the negative and control mood conditions defensive pessimists' moods became better (they also performed better), whereas in the positive mood condition, defensive pessimists' moods became worse (they also generated more upward than downward counterfactuals), over time.

STUDY 3: SPONTANEOUS SIMULATIONS AND TASK REPEATABILITY

Study 3 was designed to address some final issues regarding spontaneous mental simulations and task repeatability. In Study 1, the concept of prefactuals was explicitly described, and in Study 2 the concept of counterfactuals was explicitly described, before asking participants to simulate alternatives. To assess these thoughts in a more spontaneous manner, participants in Study 3 were merely asked to describe their performances, which were recorded and later coded for prefactual simulations (cf. Sanna & Turley, 1996). A second purpose of Study 3 was to test the effects of task repeatability on the mental simulations of defensive pessimists and optimists. Research has shown that people will generate upward counterfactuals when they believe they will perform a task again, because upward counterfactuals primarily serve a preparative function (e.g. Markman et al., 1993; Sanna, 1996). The tasks used in the first two studies were nonrepeatable. To explore further the implications of different strategies, participants in Study 3 performed a set of two anagram tasks, and they generated prefactuals before performing the second task. Assessing the subsequent implications of these strategies for performances on the second anagram task was the third goal of Study 3. The design of Study 3 was a 2 (strategy) $\times$ 2 (mood) between-subjects factorial. Because control and negative mood conditions did not differ for defensive pessimists, and because control and positive mood conditions did not differ for optimists, in the first two studies, the control mood condition was no longer used in Study 3.

Method

Participants

Thirty-three defensive pessimists and 31 optimists, with an about equal proportion of males and females within each group, were recruited and selected on the basis of their scores on the DPQ from an initial introductory psychology pool of 255 in a manner identical to Studies 1 and 2. The experimenter who tested participants was once again unaware of their strategy assignment.

Procedure

As in the first two studies, participants signed up for a series of purportedly unrelated tasks, and were tested individually.

Mood Induction. The mood induction of Study 3 was identical to that used in Study 2.

Anagram Tasks. Two anagram lists were constructed for use in Study 3. Each list was composed of 20 anagram items that were selected from the most intermediately difficult items (solution scores between 15 and 30) of Gilhooly and Johnson (1978). The 20 anagram items used in Studies 1 and 2 were equally distributed among the two new lists, with equivalent difficulty in items. To these previous 20 items were added 20 new anagram items, for a total of 40 items (20 anagrams for each list).

These two new anagram lists were pilot tested on an independent sample of 68 introductory psychology students, which confirmed the approximately equivalent difficulty of the two lists [$t(67) = 0.91$, n.s.], (List 1, $M = 10.52$; List 2, $M = 10.21$). All participants in Study 3 were told that they would be performing a set of two similar anagram lists. However, despite using two lists in Study 3, the instructions and procedures for the anagram tasks were otherwise identical to those used in Studies 1 and 2.

Prefactual Thoughts. Between performing the two anagram tasks, participants' spontaneous thoughts were recorded and later coded. Participants were handed a page titled ''Performance Description'', and they were asked to write about their upcoming performances on the second anagram task (cf. Sanna, 1996; Sanna & Turley, 1996). Modified from Study 1, after taking 3 minutes to think about their upcoming second anagram performances, they read the following instructions:

> Please describe your future performance on the second anagram task in as much detail as possible. When doing this, elaborate on and give your opinion about any aspect of your upcoming performance or about the circumstances leading up to your performance. Describe your upcoming performance on the second anagram task in such a way that the researchers could fully understand your possible future performance on that task. Writing a description of your future anagram performance will normally take you about 10 to 15 minutes.

Nothing more was said. That is, participants were not explicitly prompted for prefactual thoughts; they were merely asked to write about their upcoming performances on the second anagram task.[5]

[5] It is worth emphasising that the prefactual measure in Study 3 was assessed after participants performed the first anagram task and before they performed the second anagram task. That such thoughts were measured after performing a first task, may in some sense make them "counterfactual" as well. However, as the methods and instructions indicated, the primary focus of participants was on the future, upcoming, second anagram task.

Post-mood. Finally, after performing the second anagram task, participants responded to the series of positive and negative mood adjectives for a second time.

Results and Discussion

Manipulation Checks

Mood manipulation check items were appropriately reverse scored and averaged (Cronbach's α = .80), and a 2 (strategy) $\times$ 2 (mood) ANOVA on this measure revealed only a mood main effect [$F(1,60)$ = 12.21, $P < .01$], (positive, M = 6.26; negative, M = 3.04), once again indicating that the music manipulations were effective in inducing the intended moods. To facilitate comparisons with the previous two studies, the mood check means by condition are also presented in the first row of Table 3.

Anagram Performance 1

The number of items correctly answered by participants on the first anagram task were submitted to a 2 (strategy) $\times$ 2 (mood) ANOVA. This analysis revealed only a Strategy $\times$ Mood interaction [$F(1,60)$ = 14.44, $P < .01$], (see Table 3). As predicted, and consistent with Studies 1 and 2, defensive pessimists correctly answered fewer anagram items when in a positive mood than when in a negative mood, whereas optimists correctly answered fewer items when they were in a negative mood than when they were in a positive mood, both $t(60)$s > 2.64, Ps < .01.

TABLE 3
Mean Mood Manipulation Check, Anagram Performance, Upward and Downward Prefactuals, and Post-mood by Strategy and Mood for Study 3

	Defensive Pessimist		*Optimist*	
Variable	*Positive*	*Negative*	*Positive*	*Negative*
Mood check	6.18	2.97	6.34	3.16
Anagram performance 1	9.77	14.01	13.82	9.30
Upward prefactual	3.39	2.00	1.21	1.28
Downward prefactual	0.51	0.62	0.70	1.41
Anagram performance 2	14.21	13.63	13.04	12.94
Post-mood	6.35	6.10	6.05	6.19

Prefactual Thoughts

Two judges, each unaware of hypotheses, coded participants' performance descriptions for prefactuals. Thoughts were considered prefactuals if they mentioned changes that would potentially alter a person's upcoming anagram performance (e.g. using terms such as *should*, *could*, *would*, *etc.*; cf. Sanna, 1996; Sanna & Turley, 1996; Roese & Olson, 1995). Upward prefactuals described things that would make future performances better (e.g. ''I think I can really concentrate harder this time, and I should do better''), whereas downward prefactuals described things that would make future performances worse (e.g. ''I do fine on harder items, on the next task I'm worried that I won't perform as well''). Overall agreement between the two judges was 83% (upward, 89%; downward, 80%). Any discrepancies in coding were resolved through discussion.

A 2 (strategy) × 2 (mood) × 2 (prefactual: upward, downward) ANOVA, with prefactual as a within-subjects variable, revealed main effects of strategy [$F(1,60) = 4.15$, $P < .05$], (defensive pessimist, $M = 1.64$; optimist, $M = 1.17$), and prefactual [$F(1,60) = 24.46$, $P < .001$], (upward, $M = 1.97$; downward, $M = 0.74$). In addition, there were the following interactions: Strategy × Mood, [$F(1,60) = 4.78$, $P < .05$]; Strategy × Prefactual [$F(1,60) = 16.69$, $P < .01$]; and Mood × Prefactual [$F(1,60) = 5.16$, $P < .05$]. Most important, however, were specific sets of contrasts (see Table 3). Defensive pessimists generated more upward than downward prefactuals in both the positive and negative mood conditions, both $t(60)$s > 2.92, Ps $< .05$. In fact, defensive pessimists generated the largest number of upward prefactuals in the negative mood condition; the positive and negative mood conditions differed in the number of upward prefactuals for defensive pessimists [$t(60) = 2.99$, $P < .01$]. For optimists, in contrast, neither the number of upward and downward prefactuals within mood conditions, nor the number of upward and downward prefactuals between mood conditions, differed from each other.

Anagram Performance 2

Assessing the subsequent implications of these strategies for performances on the second anagram task was another goal of Study 3. A 2 (strategy) × 2 (mood) ANOVA on the number of correctly answered items on the second task revealed what is perhaps most striking result of Study 3: All participants performed equally well on the second anagram task. The ANOVA revealed no significant effects, and none of the performance means differed on the second task. This was true whether participants performed well or poorly on the first anagram task, and could provide further evidence that defensive pessimists and optimists can each cope

effectively by successfully using their strategies. Defensive pessimists, of course, generated more upward than downward prefactuals between performing the two tasks (particularly so after performing poorly on the first task in the positive mood condition), consistent with their preferred prefactual strategy). Optimists, in contrast, engaged in little prefactual thinking between performing the two tasks, consistent with their preferred prefactual strategy. Importantly, these thoughts were generated spontaneously in Study 3.

To examine further these findings, some additional correlational analyses were conducted. As in Study 1, the mean number of downward prefactuals was subtracted from the mean number of upward prefactuals. This index of prefactual direction was then correlated with second anagram performances separately for defensive pessimists and optimists within each mood condition. For each mood condition, defensive pessimists' performances were significantly related to their prefactual thoughts [r(16 & 17)s > .52, Ps < .05]. As the relative number of upward prefactuals increased, so did second anagram performances. For optimists, however, second anagram performance was not related to prefactuals in either mood condition. These analyses thus replicate those of Study 1. Moreover, Study 3 further suggests a qualification of optimists' mental simulation strategies. They engaged in more downward simulations after performing in Study 2, when there was no possibility of a second try, but they did not use many mental simulations in Study 3, when they were about to perform a second similar task. These results add to those of the first two studies by assessing participants' prefactual strategies between performing two similar tasks, and also by assessing their performances on that second task.[6]

Post-mood

A 2 (strategy) × 2 (mood) ANOVA on the post-mood measure (Cronbach α = .94) revealed no significant differences among conditions. As with second anagram performances, defensive pessimists' and optimists' post-moods did not differ among conditions, further consistent with

[6] A supplementary 2 (strategy) × 2 (mood) × 2 (time: performance 1, performance 2) ANOVA was also conducted, to test whether participants' anagram performances changed over time. The two anagram performances (rows 2 and 5 of Table 3) were used as a repeated measures variable. There was a main effect of time [F(1,60) = 4.59, P < .05], Strategy × Mood [F(1,60) = 6.58, P < .05], and three-way [F(1,60) = 8.21, P < .01] interactions. Specific contrasts indicated that performances improved over time for defensive pessimists in the positive mood condition [t(60) = 2.83, P < .01]; of course, it was also in this condition that they generated the most upward prefactuals. The performances of optimists also improved over time in the negative mood condition [t(60) = 2.18, P < .01]; of course, they also engaged in few prefactual thoughts in this condition.

notions that the two groups can cope effectively by successfully using their strategies. Ultimately, defensive pessimists and optimists perform well and feel good, and are able to ''rebound'' from initial poor performances.[7]

As in the first two studies, defensive pessimists and optimists thus each performed best under conditions that were conducive to their use of preferred strategy. Defensive pessimists performed best in the negative mood condition and optimists performed best in the positive mood condition on the first anagram list. However, an impending second anagram task modified defensive pessimists' and optimists' mental simulation strategies. What is perhaps most important about Study 3 is that these modifications in strategies by task repeatability occurred irrespective of whether each group did well or poorly (in response to manipulated moods) on the first anagram task. Study 3 also examined the prefactual strategies of defensive pessimists and optimists after they already have had some experience with a previous similar task, and it did so with more spontaneous measures of prefactuals.

GENERAL DISCUSSION

The three studies reported in this article provide converging evidence that moods can influence the mental simulation (prefactual and counterfactual) strategies and subsequent performances of defensive pessimists and optimists. Across all three studies, directly and independently manipulated positive and negative moods for defensive pessimists and optimists were demonstrated to have a variety of different consequences for prefactual and counterfactual simulations, performances, and affect.

Moods and Strategies of Defensive Pessimists and Optimists

Defensive pessimists use an assortment of diverse responses as a strategic attempt to deal with a variety of life events (e.g. Norem & Cantor, 1986a; Norem & Illingworth, 1993; Showers, 1992). As one set of strategies, Sanna (1996) has shown that the prospective preparation of defensive pessimists is served by upward prefactuals, whereas the retrospective affect repair of optimists is served by downward counterfactuals. The present three studies

[7] A supplementary 2 (strategy) × 2 (mood) × 2 (time: mood check, post-mood) ANOVA, with the two mood measures (rows 1 and 6 of Table 3) used as a repeated-measures variable, revealed main effects for mood [$F(1,60) = 6.94$, $P < .05$] and time [$F(1,60) = 5.99$, $P < .05$], and a Mood × Time ($F(1,60) = 6.47$, $P < .05$] interaction. Contrasts indicated that defensive pessimists' and optimists' moods each improved over time in the negative mood conditions [$t(60)$s > 2.36, $P < .01$], further consistent with notions of successful coping strategies for the two groups.

add to and go beyond existing research by indicating that directly and independently manipulated moods can further moderate such influences. In Study 1, defensive pessimists in negative moods generated more upward than downward prefactuals, and they performed best. Negative moods and upward prefactuals are consistent with defensive pessimists' normal preperformance moods and prefactual strategies. However, when defensive pessimists were put into positive moods, they generated more downward than upward prefactuals, a nonpreferred strategy (Sanna, 1996), and they performed worst. In contrast, optimists performed best when in positive moods, in which they used little prefactual thinking, consistent with their normal preperformance moods and prefactual strategies. Conversely, optimists performed worst when put into negative moods, which induced them to generate more upward than downward prefactuals, a nonpreferred strategy for them.

Further, generality to the argument that moods can influence the strategies and subsequent performances of defensive pessimists and optimists was obtained in Study 2. Prior research had shown that optimists will use more downward counterfactual thinking after performances to maintain or restore positive moods, whereas defensive pessimists do not normally engage in much counterfactual thinking (Sanna, 1996), consistent with suggestions that optimists engage in types of attributional egotism (e.g. Alloy & Abramson, 1979; Synder et al., 1978) after performances (Norem & Cantor, 1986a). Directly manipulated positive and negative moods again differentially influenced the performances of defensive pessimists and optimists in Study 2, and this was true even though no prefactual thoughts (in fact no thoughts of any kind) were solicited, precluding the possibility that having participants write down prefactuals before performing (as was done in Study 1) was the sole reason for the observed performance effects. Moreover, optimists generated more downward than upward counterfactuals, and they felt good after performances, irrespective of whether they performed well or poorly. In contrast, defensive pessimists did not do much counterfactual thinking after performing well, which is consistent with their preferred counterfactual strategy. Ironically, defensive pessimists did engage in more upward counterfactual thinking when they did poorly, perhaps indicative of ruminative (cf. Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 1994) attempts to apply their anticipatory strategies erroneously after the fact.

Additional insight into these reactions was obtained in Study 3. Although task repeatability was not varied factorially within Study 3, comparisons across the three studies suggest that task repeatability can further moderate the strategies of defensive pessimists and optimists. Another interesting feature of Study 3 was that both defensive pessimists and optimists performed well on, and felt good after, performing a second

anagram task, suggesting that ultimately both groups display successful coping strategies, and can rebound from poor performances on a first task. That participants' prefactual thoughts were associated with second anagram performances in Study 3 is further suggestive of their influence. An alternative that must be acknowledged, however, is that there may have been a natural tendency for moods to become more positive over time, irrespective of condition. Thus, although results are so far consistent with the notion that defensive pessimists and optimists were successful on the second anagram task in Study 3 because of their use of preferred prefactual strategies, additional research on the effects of moods on defensive pessimists' and optimists' performances on repeatable tasks would be valuable. In Study 3, it is further noteworthy that mental simulations were solicited in a relatively spontaneous fashion (e.g. Markman et al., 1993; Sanna, 1996; Sanna, Meier, & Turley-Ames, in press; Sanna & Turley, 1996), adding further validity to the generality of the present arguments. It thus appears that mood influences on defensive pessimists' and optimists' strategies and subsequent performances can be bitter-sweet.

Implications and Conclusions

It is interesting to speculate that moods may be driving the observed effects in previous research as well. For example, ''encouragement'' (Norem & Illingworth, 1993) may have put participants into positive moods; optimists performed well and defensive pessimists performed poorly under such conditions, which is consistent with the results of the present research when positive and negative moods were directly manipulated. Forcing participants to focus on negative outcomes before performing (Showers, 1992), or forcing participants to consider prefactuals (Sanna, 1996), may have similarly induced corresponding changes in participants' moods. Defensive pessimists who considered negative outcomes performed better than those who considered positive outcomes; the negative focus could have put defensive pessimists into negative moods and they performed best under such conditions. Forcing participants to consider upward prefactuals could have also put participants into negative moods (by forcing contrasts with better alternatives), which is consistent with defensive pessimists' preferred strategy, but not that of optimists'. It is noteworthy, however, that in the present research (Studies 1 and 2), defensive pessimists performed equivalently in the negative and control mood conditions, and they felt equivalently bad; optimists performed equivalently in the positive and control mood conditions, and they felt equivalently good. Given that two completely different mood manipulations were used in the two studies (films and music), and given that these manipulations have successfully induced intended moods in previous research, it is perhaps the case that

optimists are less influenced by induced positive moods and defensive pessimists are less influenced by induced negative moods (see Footnote 2). Assessing whether moods might be driving the types of strategy differences and performance effects obtained in previous research may be a particularly intriguing avenue for future investigation.

The present series of studies thus have further implications for the relationships between moods and mental simulations more generally. Research supporting the influence of mental simulation direction (particularly counterfactuals) on moods has been well documented. In particular, by way of contrast (e.g. Schwartz & Bless, 1992), downward counterfactuals have been shown to elicit positive moods, whereas upward counterfactuals have been shown to elicit negative moods (Markman et al., 1993; Roese, 1994; Sanna, 1996; cf. Sanna, 1997). Other evidence suggests that mental simulation direction is related to naturally occurring moods. For example, with specific reference to individual strategy differences, Sanna (1996) found that defensive pessimists, who in part may use negative moods as a motivational strategy, are adept at generating upward prefactual thoughts before performing. Upward prefactuals were also found to be associated with negative moods. In contrast, optimists, who are generally in positive moods, were found to generate downward counterfactuals after performing, and downward counterfactuals were associated with positive moods. Of course, what was not clear from this prior research was whether optimists were in good moods because they generated downward counterfactuals, or whether they generated downward counterfactuals because they were in good moods, and the same was true for the causal relationship between defensive pessimists' negative moods and their prefactual simulations. It is important to emphasise, therefore, that the present series of studies employed directly and independently manipulated positive and negative moods, lending further credence to the notion that moods can serve as both antecedents and a consequence of mental simulations (see also Sanna et al., 1998, in press). The present research indicates that mood influences extend to prefactual generation as well.

The present studies also have implications for defensive pessimists' and optimists' responses to success and failure experiences. For example, in Study 1, more upward prefactuals were generated when in negative moods and more downward prefactuals were generated when in positive moods overall. These similarities raise the possibility that many of the outcome effects observed in previous research also may actually be the result of the mood states they occasion. After all, successes beget positive moods, and failures beget negative moods (see also Roese & Olson, 1997). There is further evidence consistent with this argument in the counterfactual domain. That is, failures elicit more upward counterfactuals and successes elicit more downward counterfactuals (e.g. Markman et al., 1993). If a

primary reaction to failure is negative mood and success is positive mood, then results of these outcome studies are also consistent with the present findings. In other words, people may not be responding to the failure or success *per se*, but to the sadness and happiness they engender. It is noteworthy, however, that the results of Studies 2 and 3 suggest that these proposals may be qualified by also considering the counterfactual strategies of defensive pessimists and optimists. In particular, optimists in Study 2 generated more downward counterfactuals after they did poorly (in response to negative moods), just as they had been shown to do after failures (Sanna, 1996). Repeatability of tasks may also provide a situational moderator to these general tendencies, as was suggested in Study 3. Defensive pessimists' usual strategies, in contrast, include little counterfactual thinking. However, defensive pessimists did generate more upward counterfactuals after doing poorly when tasks were not repeatable in Study 2. Future research may be fruitfully directed towards these hypotheses, and comparisons between mental simulations resulting from directly manipulated moods and those resulting from success and failure (see Footnote 3; see also Roese & Olson, 1997) would certainly merit future attention.

Finally, the present studies may help to illuminate the coping responses of defensive pessimists and optimists. For example, researchers have distinguished two major functions of mental simulations which differ by direction; preparative and affective (Markman et al., 1993; Roese, 1994; Sanna, 1996, 1997). The coping literature has also identified activities aimed at self-improvement and affect regulation (Folkman & Lazarus, 1991; Lazarus & Folkman, 1984; Wood & Taylor, 1991). Defensive pessimists appear to be more attuned to, or can make better use of, the preparative function of mental simulations, whereas optimists appear to be more attuned to, or can make better use of, the affective function of mental simulations. These strategies thus may have further applicability when assessing reactions to life events (Davis & Lehman, 1995) more generally. However, mental simulations can also be dysfunctional (e.g. Sherman & McConnell, 1995). For example, if negative affect is both a cause and a consequence of upward mental simulations, then vicious cycles of negative affect may develop. Study 2 suggests that this might be particularly true for defensive pessimists after failures if there is no chance for a second try and if they were inhibited from using their preferred prefactual strategy. In contrast, optimists may find negative moods before performance especially disturbing because it forces them to consider the implications of possible failure. Each strategy group may therefore be vulnerable in specific types of situations. Nevertheless, just because mood and individual differences can be important determinants of mental simulations, this does not preclude other possible determinants. However, it can also be argued that moods and individual differences are an inevitable aspect of human

existence. The present results indicate that affect is so intertwined with mental simulation that it is both a cause and consequence of it. Assessing the influence of moods on mental simulations thus not only may increase what is known about different personality strategies, but may also further an understanding of the relationships between moods, performances, and mental simulations more generally.

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