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Mood, Self-Esteem, and Simulated Alternatives: Thought-Provoking Affective Influences on Counterfactual Direction

Lawrence J. Sanna, Kandi Jo Turley-Ames, and Susanne Meier
Washington State University

Four studies indicated that moods and self-esteem can influence counterfactual thoughts. This was shown for counterfactuals generated for hypothetical situations (Study 1), for recalled life events (Study 2), and for agreement with counterfactual statements after laboratory tasks (Studies 3 and 4). High self-esteem (HSE) and low self-esteem (LSE) persons generated (Studies 1 and 2) or agreed to (Studies 3 and 4) more downward (worse than actuality) than upward (better than actuality) counterfactuals when in good moods, but they diverged in reactions to bad moods: HSE persons thought more about downward counterfactuals, whereas LSE persons thought more about upward counterfactuals. HSE persons felt better after generating downward counterfactuals (Study 2) and took longer to agree to analogous statements (Studies 3 and 4) in bad moods, suggesting attempts at mood repair.

Counterfactual thinking refers to "if only" or "at least" mental simulations of alternative possible outcomes that people often have in response to events in their lives. Such thoughts can occur spontaneously (Sanna & Turley, 1996), and they can influence affective reactions (Gleicher et al., 1990; Johnson, 1986; Landman, 1987), accident and victim compensation (Macrae & Milne, 1992; Miller & McFarland, 1986; Turley, Sanna, & Reiter, 1995), blame assignment (Miller & Gunasegaram, 1990), coping responses (Davis & Lehman, 1995), and causal ascriptions (Gavanski & Wells, 1989; Wells & Gavanski, 1989; Wells, Taylor, & Turtle, 1987). Given the considerable associations across a wide variety of life events, counterfactual thoughts are not only pervasive, but they are also perhaps even an essential feature of people's social–cognitive functioning (see Roese & Olson, 1995, for reviews).

In this article, we present four studies that test the role of moods and self-esteem as antecedents to counterfactual direction. Research has shown that *downward counterfactuals,* simulations that are worse than reality (e.g., "At least I was wearing my seatbelt, or I might have been more seriously injured"), elicit positive moods, whereas *upward counterfactuals,* thoughts that are better than reality (e.g., "If only I had studied harder, I might have gone to medical school"), elicit negative moods (Markman, Gavanski, Sherman, & McMullen, 1993; Roese, 1994; Sanna, 1996). However, we propose and test a converse, equally intriguing, but as yet unstudied alternative: that moods may influence counterfactual direction. In addition, because high self-esteem (HSE) and low self-esteem (LSE) persons deviate in reactions to moods (e.g., Brown & Mankowski, 1993), we examine self-esteem as a moderator of these influences. Therefore, not only might our research extend what is known about counterfactual direction and moods, but also it may further clarify an understanding of the motives underlying self-esteem.

Moods as Reactions to Counterfactual Direction

People's affective reactions can diverge depending on counterfactual direction (e.g., Markman et al., 1993; Roese, 1994; Sanna, 1996). By way of contrast (Schwarz & Bless, 1992), downward counterfactuals elicit positive moods, whereas upward counterfactuals elicit negative moods. For example, Markman et al.'s (1993) participants played a computer-simulated blackjack game and generated a higher proportion of upward than downward counterfactuals after failure (losing) and when the game was repeatable; in contrast, more downward than upward counterfactuals were generated after success (winning). Higher proportions of upward counterfactuals were associated with more negative moods (less satisfaction), whereas higher proportions of downward counterfactuals were associated with more positive moods. The relation between counterfactual direction and satisfaction remained significant even when the two manipulated variables were controlled statistically, suggesting a causal linkage between direction and affect. Adding to this evidence, Roese (1994) found that participants reported more positive moods when induced to generate downward counterfactuals, and Sanna (1996) found that downward and upward counterfactuals were associated with positive and negative moods, respectively.

Upward and downward counterfactuals each may come with trade-offs, however. Downward counterfactuals may enhance sat-

Lawrence J. Sanna, Kandi Jo Turley-Ames, and Susanne Meier, Department of Psychology, Washington State University.

Kandi Jo Turley-Ames is now at the Department of Psychology, Idaho State University.

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Correspondence concerning this article should be addressed to Lawrence J. Sanna, Department of Psychology, P.O. Box 644820, Washington State University, Pullman, Washington 99164-4820. Electronic mail may be sent to sanna@wsu.edu.

isfaction but may leave a person unprepared, whereas upward counterfactuals may lead to dissatisfaction but may assist in future preparation (Markman et al., 1993; cf. Boninger, Gleicher, & Strathman, 1994). Although researchers have only begun to study the functions of counterfactuals, these notions are additionally, albeit indirectly, consistent with some social comparison research. For example, cancer patients may make downward social comparisons in order to feel better (Taylor, Wood, & Lichtman, 1983), and upward social comparisons may provide the most pertinent information for self-betterment (Taylor & Lobel, 1989). Whether comparisons are made with other people, as with social comparisons, or with alternative simulated outcomes, as with counterfactuals, the motives underlying the two processes might be quite similar (Markman et al., 1993; Taylor & Schneider, 1989). In each case, better or worse contrasts produce differing functional and affective consequences.

Moods as Antecedents to Counterfactual Direction

There are converging reasons to believe, however, that moods may also serve as antecedents to counterfactual direction. A large literature indicates that preexisting affective states can influence a variety of judgments (see Schwarz & Clore, 1996, for a review). Several theories, although perhaps differing somewhat in specifics, have in common the notion that moods serve as information. For example, according to one perspective, moods may serve as a signal to the organism. In particular, negative affect may signal the presence of acute problems, whereas positive affect may signal that all is fine (e.g., Frijda, 1988; Schwarz, 1990). According to functional views (Markman et al., 1993; Roese, 1994; Sanna, 1996), counterfactuals may be one cognitive response that is mobilized to deal with aversive situations (Roese & Olson, 1997), and upward counterfactuals in particular are preparative. Upward counterfactuals, because of their preparative nature, thus could be one likely result of bad moods. Consistent with this possibility, Markman et al.'s participants generated predominantly upward counterfactuals after failures, and failures may have induced bad moods (e.g., Brown & Mankowski, 1993; Roese & Olson, 1997). If moods serve simply as signals, then one possibility is that positive affect will produce little or no counterfactual thinking of any kind. That is, because good moods may signal that all is fine and that there is no problem that needs to be dealt with, counterfactual thinking might be less likely. However, this perspective by itself does not account for the fact that Markman et al.'s participants also generated more downward than upward counterfactuals after successes.

Assuming that bad moods signal trouble, however, is only one facet of "feelings-as-information" views (Martin, Ward, Achee, & Wyer, 1993; Sanna, Turley, & Mark, 1996; Schwarz & Clore, 1988, 1996). Both positive and negative moods can serve as information for all sorts of judgments. The models postulate that when evaluating target events, people ask "How do I feel about it?" For example, good moods can be construed as information that one has high life satisfaction, whereas bad moods may mean that one is dissatisfied (Schwarz & Clore, 1983; see also Forgas & Moylan, 1987). It is thus also possible that feelings-as-information and contrast effect (Schwarz & Bless, 1992) proposals may provide predictions for both good and bad moods and may explain why successes (Markman et al., 1993) resulted in downward counterfactuals. Good moods lead to positive interpretations (e.g., "I am a success") and bad moods lead to negative interpretations (e.g., "I am a failure") of current life circumstances. One's current life then serves as an anchor and forms a basis from which *counterfactual alternatives* are generated. In other words, bad moods lead to construing one's position as poor (actuality) and, by contrast, alternatives (not actuality) might be better or upward counterfactuals (e.g., having studied harder and gone to medical school). However, analogous predictions also may be made for positive moods or for successes. Good moods may lead to construing one's position as favorable (actuality), which, by contrast, might lead to a person's counterfactual (not actuality) thoughts focusing on how things may have been worse (e.g., having been seriously injured or worse while not wearing a seatbelt). The informational impact of moods on perceptions of one's current life may serve as an anchor for counterfactual generation whatever the possible underlying motives; much research demonstrates that people do in fact think counterfactually, whether induced by experimental prompts or situational cues or simply produced spontaneously.

The view that moods provide information about life circumstances is similar to a related view that additionally suggests a specific motive for why good moods may lead to downward counterfactuals. Moods may serve as information about the self. Bad moods make accessible negative self-thoughts, whereas good moods make accessible positive self-thoughts (e.g., Bower, 1991; Isen, Shalker, Clark, & Karp, 1978; Sedikides, 1992; see also McMullen, Markman, & Gavanski, 1995). Persons in bad moods may feel worthless or inferior, and this again serves as an anchor, which by a contrast mechanism (Schwarz & Bless, 1992) may be more likely to lead to an alternative world that is upward or brighter. Because upward counterfactuals are preparative, they may be produced in response to bad moods, as described previously. However, downward counterfactuals serve an affective function (Markman et al., 1993; Roese, 1994; Sanna, 1996). Good moods may result in positive self-views, which are used analogously as an anchor, but in this case a contrasting alternative may be most likely to lead to downward counterfactuals worse than actuality. This position also suggests that people in good moods may wish to prolong their pleasant states (e.g., Clark & Isen, 1982; Isen, 1987), and such mood maintenance might be accomplished effectively by thinking about downward counterfactuals. Several related feelings-as-information views thus suggest that moods may influence counterfactual direction. Bad moods may serve as a signal of trouble or as an anchor from which upward counterfactuals are generated. Good moods may not influence counterfactuals if they serve simply as a signal, but they may influence counterfactuals if they serve as an anchor or induce a favorable state that one attempts to maintain.

Self-Esteem and Reactions to Moods

It is likely, however, that the relationship between moods and counterfactuals will be elucidated further by the work on self-esteem, because HSE and LSE people differ in reactions to moods. Several studies have demonstrated that self-esteem differences are most pronounced when confronting valenced life events (e.g., Brown, 1991; Brown & Dutton, 1995) such as successes or failures. It appears that HSE and LSE persons react similarly to

positive events but diverge in reaction to negative events, and similar responses have been demonstrated with directly and independently manipulated moods (Brown & Mankowski, 1993). In particular, for LSE persons good experiences produce positive reactions and bad experiences produce negative reactions; in contrast, HSE persons react positively to good experiences but seem to reject, limit, or offset bad experiences (e.g., Brown & Mankowski, 1993). It may be reasonable to argue, in fact, that many reactions to life events are produced precisely because these events influence moods (Brown & Mankowski, 1993; see also Roese & Olson, 1997). In support of this, Brown and Mankowski conducted a pair of studies in which moods were varied directly using the Velten (1968) procedure or music. Both HSE and LSE participants evaluated specific self-attributes (e.g., kindness) positively when in good moods; however, HSE participants were less likely than LSE participants to lower self-evaluations of these same attributes when in bad moods. In a third study, reactions were shown to covary with naturally occurring moods. Because of these asymmetries, it thus seemed possible in our research that positive moods might elicit similar counterfactual reactions but that negative moods might elicit differing counterfactual reactions among participants with HSE and LSE.

Focusing on HSE and LSE persons may also help to further illuminate the nature of their coping strategies and may help to explicate the processes by which moods affect counterfactuals. For example, Isen (1984, 1987; see also Clark & Isen, 1982) has argued that the influence of positive affect is relatively direct and simple, whereas the influence of negative affect is more complex and harder to predict. The main reason for this is that bad moods often engender attempts at mood repair. In other words, as we have suggested previously, people in good moods may wish to prolong the pleasant state, dwelling on pleasant thoughts. Considering downward counterfactuals in the present context may allow one to do this. In contrast, people in bad moods may want to escape their unpleasant state. Defending oneself from emotionally distressing situations may be realized by constructing material of an affective valence opposite of that to which they are exposed (e.g., Parrott & Sabini, 1990; S. M. Smith & Petty, 1995), a mood-incongruence effect. This might be accomplished in the present context by thinking about downward counterfactuals when in negative moods. Clark and Isen (1982) have further suggested that although mood congruent effects may be guided by automatic processing, mood incongruent effects may be guided by more controlled or effortful processing (see also Forgas, 1995; Erber & Erber, 1994). Applying this line of reasoning to the present research, bad moods might automatically engender upward counterfactuals, which are then overridden by downward counterfactuals as a more controlled and effortful attempt at mood repair. However, this mood-repair strategy may be most evident among HSE persons.

Because HSE persons offset negative events by using self-enhancement strategies (Brown, Collins, & Schmitt, 1988; Wheeler & Miyake, 1992) more than LSE persons do (Brown & Mankowski, 1993), they may use downward counterfactuals when in bad moods to repair mood, whereas LSE persons might not use such a strategy. This is similar to arguments that downward social comparisons (Wills, 1981) are self-enhancing (Taylor & Schneider, 1989), and the strongest support that threat induces downward comparisons is among HSE persons (Collins, 1996). Evidence related directly to counterfactuals is sparse and indirect. However, failures have produced upward counterfactuals and successes have produced downward counterfactuals (Markman et al., 1993). If failures elicit bad moods and successes elicit good moods (Brown & Mankowski, 1993; Roese & Olson, 1997), then studies manipulating outcome valence may be consistent with our proposals. Successes and failures, however, may alter other conceptually distinct variables in addition to moods, such as expectancies (Sanna, 1997), and our present research is valuable because of its focus on manipulating moods directly. With regard to self-esteem, Roese and Olson (1993) found that HSE persons mutated their own actions after success, whereas LSE persons mutated their own actions after failure. This may suggest that HSE persons take credit for successes but blame failures on external factors and could indirectly indicate a self-enhancement motive. Kasimatis and Wells (1995) found that HSE was positively correlated with downward counterfactuals and negatively correlated with upward counterfactuals. Our research thus may not only extend what is known about mood and counterfactuals but may also elucidate the motives that may underlie self-esteem.

Overview of the Present Studies

To summarize, the goals of our research were first to test the role of moods as antecedents to counterfactuals and then to test self-esteem as a moderator of such influences. In Study 1, tests to determine if moods influence counterfactuals were conducted with a set of hypothetical scenarios. Moods were induced using a series of film clips, and HSE and LSE counterfactual reactions were assessed. We conducted Study 2 to test whether HSE and LSE persons use counterfactuals to ameliorate negative affect, and moods were measured both before and after counterfactual generation. To increase generality, we manipulated moods with music, and participants generated counterfactuals in response to actual recalled life events. Given our arguments, if moods influence counterfactuals we might expect similar reactions among HSE and LSE persons in the case of positive moods. It is likely that positive moods may not influence counterfactuals, or that downward counterfactuals may be generated. In contrast, HSE persons may diverge from LSE persons in response to bad moods. HSE persons might use downward counterfactuals to offset upward counterfactuals when in bad moods, whereas LSE persons might not use such a strategy. In Studies 3 and 4, we used a laboratory anagram task. These two studies specifically tested the notion that generating downward counterfactuals in response to bad moods involves a more controlled process. We measured participants' agreement to upward and downward counterfactual statements and assessed reaction times when they responded. In Study 3, we also included a no-mood control group to clarify the direction of our results. Finally, in Study 4, we gave half of our participants a high cognitive load to further assess the relative automaticity of differential counterfactual reactions. Self-esteem was similarly measured in our final two studies.

Study 1: Simulated Situations Task (SST)

In an initial test of these ideas, we directly manipulated positive and negative moods using a series of film clips (Martin et al., 1993; Sanna et al., 1996). Participants then read a series of scenarios that were modified from the SST (Dykman, 1996, 1997).

After imagining themselves in the depicted situations, participants generated counterfactual thoughts. The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) was used to assess self-esteem. One possibility was that positive moods might not influence counterfactual thinking overall; a second possibility was that positive moods would elicit downward counterfactual thinking. Overall, negative moods may elicit upward counterfactual thinking. However, reactions to negative moods could be further moderated by participants' levels of self-esteem. It seemed likely that HSE participants would generate more downward counterfactuals than LSE participants do when in negative moods, suggestive of a mood-repair strategy. The design of Study 1 was a 2 (self-esteem: HSE, LSE) × 2 (mood: positive, negative) between-subjects factorial.

Method

Participants

Participants were 72 female and 50 male introductory psychology students who received extra course credit for participating and who were recruited on the basis of their scores on the RSES. Approximately equal numbers of male and female students were recruited from both HSE and LSE groups and were approximately equally distributed among mood conditions.

Self-Esteem

The RSES is a widely used and well-validated measure of global self-worth (Rosenberg, 1965, 1979). It consists of 10 items (e.g., "I take a positive view of myself" and "All in all, I am inclined to think I am a failure"), which are answered on 4-point scales ranging from 0 (*strongly disagree*) to 3 (*strongly agree*). After reverse scoring 5 of the items, a total self-esteem score can be computed by summing across the 10 items (Brown & Mankowski, 1993; cf. Baumeister, Tice, & Hutton, 1989). We administered the RSES to 267 students at the beginning of the semester as part of a mass survey session. Participants were selected from the upper (HSE) and lower (LSE) thirds of the distribution. In Study 1, 64 participants were classified as HSE (M = 25.72) and 58 participants were classified as LSE (M = 16.67). The experimenter who tested the participants was unaware of their self-esteem levels.

Procedure

Participants arrived at the laboratory and were tested in groups of 3 to 6. A cover story indicated that the experiment involved a series of unrelated activities that included rating movies and other cognitive tasks being tested for possible use in future research.

Mood induction. To induce moods, we had participants watch and rate clips from three films. In the *positive mood* condition, participants watched humorous clips from the films *Splash* and *Stripes,* whereas in the *negative mood* condition, participants watched sad clips from the films *Gallipoli* and *Sophie's Choice.* Preceding these, participants watched a car chase scene from the movie *Bullitt;* although it's engaging, this clip is relatively neutral in valence for participants. We included it primarily to draw participants' attention away from the overall emotional tone of the films and thus to lessen the chances they would guess that the clips were designed to influence their moods. The series of film clips lasted about 20 min. After each clip, participants responded to surveys titled "Pilot Movie Ratings." These asked for routine ratings of the film clips (e.g., whether they had seen the movie before; see Sanna et al., 1996). These procedures have induced moods effectively in previous research (Martin et al., 1993; Sanna et al., 1996).

After 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 adjectives were *happy, satisfied, pleased, delighted, content, relieved,* and *glad;* the negative adjectives were *gloomy, annoyed, depressed, miserable, sad, disappointed,* and *frustrated.* Each of the adjectives was rated on 9-point scales ranging from 1 (*not at all*) to 9 (*very much*).

Once the mood ratings were completed, the experimenter asked the participants to draw a map of their university campus, supposedly to test people's representations of their environments; they were allowed 1 min to do this. 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 suggest that participants might discount their moods as a basis for their behaviors if the moods are rated immediately before the task of interest (see Berkowitz & Troccolli, 1990).

SST. Consistent with the cover story, participants were told that as part of another pilot study on "imagining situations," they would read a set of situation descriptions and then they would be asked to give their impressions of the depicted events. Six situation descriptions were used, which were modified from the SST (Dykman, 1996, 1997) to include both positive and negative events within a single scenario. For example, one description about a job as a lab assistant read as follows:

> You take a summer job as a lab assistant. The job involves duties such as washing glassware, taking care of expensive equipment, and preparing delicate chemical mixtures that will later be used in important experiments. The work turns out to be very interesting. Some things go well and some things go poorly. For example, while on the job, you were able to catch a calibration mistake that someone else had made. You also make some important contributions to an experimental design, and you came up with good ideas for some new experiments. However, you also broke a necessary piece of equipment, which ruined some experiments. In addition, you made some mistakes in mixing chemicals, and you did not always completely follow instructions. After about a month on the job, your boss leaves you a note in your mailbox. In the note, he says that he's undecided about the job you are doing.

The five remaining scenarios involved meeting strangers at a wedding, interacting on a first date, making a class presentation, interviewing for a job, and taking a class exam. The six scenarios were presented to participants in random order. Participants were asked to read each description and to vividly imagine the event as if it were happening to them.

Counterfactual thoughts. After reading each SST description, participants were instructed to generate counterfactual thoughts by reading the following:

> When faced with situations such as this, people often have thoughts like "if only" or "at least." Sometimes these thoughts can be about things that would have made the situation better, and they are about things that are better than what actually happened; sometimes these thoughts can be about things that would have made the situation worse, and they are about things that are worse than what actually happened. In the spaces below, please list things that might have been different that would have made the situation either better or worse.

Participants were given 5 min to list their thoughts for each of the six SST situations, an amount of time that pilot testing had shown to be sufficient for counterfactual generation on these tasks.

Results and Discussion

Manipulation Check

Participants' ratings of the negative mood adjectives were reverse scored and averaged with those of the positive mood adjec-

tives (Cronbach's $\alpha = .83$). A 2 (self-esteem) × 2 (mood) analysis of variance (ANOVA) revealed only a mood main effect, $F(1, 118) = 12.37$, $p < .001$.[1] Participants who viewed the humorous film clips reported feeling more positive ($M = 5.13$) than did participants who viewed the sad film clips ($M = 3.93$), indicating that the mood manipulations were effective.

Counterfactual Thoughts

Two judges, each unaware of our hypotheses, coded participants' counterfactual thoughts as either upward or downward; there was an overall agreement of 88% (upward, 91%; downward, 86%). Upward counterfactuals changed things that would have made the situation better (e.g., "If only I was more careful, I might not have broken the equipment"), whereas downward counterfactuals changed things that would have made the situation worse (e.g., "If I didn't catch those mistakes we'd be really screwed"). Any discrepancies in coding were resolved through discussion.

We analyzed the mean number of total upward and downward counterfactual thoughts generated across the six SST scenarios.[2] A 2 (self-esteem) × 2 (mood) × 2 (counterfactual: upward, downward) ANOVA, with counterfactual as a within-subjects variable, revealed a main effect of mood, $F(1, 118) = 4.49$, $p < .05$ (positive, $M = 2.88$; negative, $M = 3.67$), and a Mood × Counterfactual interaction, $F(1, 118) = 9.86$, $p < .01$. Planned contrasts (Rosenthal & Rosnow, 1985) indicated that participants generated more downward ($M = 3.77$) than upward ($M = 2.01$) counterfactuals when in positive moods, $t(118) = 3.79$, $p < .01$, but more upward ($M = 3.97$) than downward ($M = 3.28$) counterfactuals when in negative moods, $t(118) = 2.01$, $p < .05$. There also was a Self-Esteem × Counterfactual interaction, $F(1, 118) = 13.43$, $p < .01$, in which HSE participants generated more downward ($M = 3.71$) than upward ($M = 2.27$) counterfactuals, $t(118) = 4.99$, $p < .01$, but LSE participants generated more upward ($M = 4.21$) than downward ($M = 2.93$) counterfactuals, $t(118) = 2.32$, $p < .05$.

These effects, however, were qualified by a Self-Esteem × Mood × Counterfactual interaction, $F(1, 118) = 16.54$, $p < .01$; see Table 1. In the positive mood condition, both self-esteem groups generated more downward than upward counterfactuals, $ts(118) > 2.43$, $ps < .05$. Neither the number of upward counterfactuals nor the number of downward counterfactuals differed between levels of self-esteem when in a good mood. In contrast, but as predicted, HSE and LSE participants differed in their reactions to negative moods. HSE participants generated more downward than upward counterfactuals, whereas LSE participants generated more upward than downward counterfactuals, both $ts(118) > 4.39$, $ps < .01$. The number of upward counterfactuals and the number of downward counterfactuals also differed between the two self-esteem levels for participants in whom a negative mood had been induced, $ts(118) > 3.87$, $ps < .05$.

Table 1
Mean Number of Upward and Downward Counterfactual Thoughts by Mood and Self-Esteem for Study 1

Mood	Self-esteem	
	High	Low
Positive		
Upward counterfactuals	2.03	2.00
Downward counterfactuals	3.63	3.90
Negative		
Upward counterfactuals	2.51	5.44
Downward counterfactuals	4.80	1.97

The results of Study 1 clearly indicated that moods can influence counterfactual direction, and they extend prior research in several ways. First, adding to research that had shown that counterfactual direction can influence moods (Markman et al., 1993; Roese, 1994; Sanna, 1996), Study 1 demonstrated that directly and independently manipulated moods can also influence counterfactual direction. Second, our findings indicate that although HSE and LSE participants responded similarly to positive moods, the two self-esteem groups differed in their reactions to negative moods (cf. Brown, 1991; Brown & Mankowski, 1993). When in positive moods, both HSE and LSE participants generated more downward than upward counterfactuals; when in negative moods, LSE participants generated more upward than downward counterfactuals, whereas HSE participants generated counterfactuals in the opposite direction. These latter findings are consistent with the notion that HSE persons are more purposeful in their use of counterfactuals, perhaps generating downward counterfactuals to repair mood (e.g., Isen, 1987).

Study 2: Recalled Actual Life Events

We conducted a second study to address some unresolved issues and to test the generality of the results of Study 1. First, one issue from Study 1 was whether HSE participants do in fact generate downward counterfactuals to ameliorate their bad moods. Our results were consistent with this argument; unfortunately, we did not specifically assess whether participants' moods changed after generating counterfactuals. For example, if HSE persons repair moods, then we might expect their negative moods to be ameliorated after generating downward counterfactuals. In Study 2, we tested this theory by assessing participants' moods before and after they generated counterfactuals. A second issue from Study 1 was our use of the SST. Although similar scenario-type methodologies have been common in counterfactual research (see Roese & Olson, 1995), it is somewhat limited because it relies on people's abilities to imagine themselves in the depicted situations. Therefore, in Study 2 we asked participants to recall actual life events (e.g., Roese, 1994) and then had them generate counterfactuals. As a third issue, because we had at least two possible predictions regarding the influence of good moods, Study 2 was conducted to test whether the positive-mood findings of Study 1 were reliable. As a fourth and final issue, to increase the generality of our research, in Study 2 we used a pair of mood-inducing music

[1] For each study reported in this article, we also conducted analyses that included sex of participant as an additional variable. Because sex of participant did not qualify any of our results, we do not discuss this variable further in this article.

[2] We also conducted further analyses that included the six SST situations as an additional within-subjects variable. However, because SST situation did not qualify our results and for ease of presentation, the results we report are averaged across the six SST situations.

selections (e.g., Dykman, 1996) instead of film clips to manipulate participants' moods.

Method

Participants

Participants were 67 female and 33 male introductory psychology students who were recruited from the upper and lower thirds of the distribution on the RSES, which was administered to 432 students at the beginning of the semester. Fifty HSE (M = 26.77) and 50 LSE (M = 16.20) participants, with approximately equal proportions of men and women, were randomly assigned to mood condition, with the constraint that each mood condition needed an equal number of HSE and LSE students.

Procedure

The procedures for Study 2 were similar to those of Study 1, but there were some differences. For example, participants in Study 2 were tested individually. There also was a change in the cover story of Study 2 to refer to rating music rather than movies. As in Study 1, the experimenter who tested the participants was unaware of their self-esteem levels.

Recalled life event. Participants performed a first task, described as "recalling life events," which ostensibly was to be used by the researchers to identify typical things that might happen to college students. Participants read the following instructions:

> This is an ongoing study of the typical life events of college students. In the spaces below, please describe a situation that has happened to you personally within the past 12 months. Pick a situation that you thought could have turned out differently. Recall the situation as clearly as you can, and try to vividly imagine yourself in that situation. Describe this situation in as much detail as possible, in a way that we can fully understand what happened to you. We ask that you not rush through this task. Take your time and describe the situation in detail.

Several pages were given to participants on which they could write their description. Participants were allowed 12 min to perform the task, an amount of time that pilot testing indicated was sufficient. The task was loosely modeled after tasks used in other counterfactual research (e.g., Roese, 1994).

Mood induction. To induce moods in Study 2, we used a pair of music selections (e.g., Clark, 1983; Brown & Mankowski, 1993; Dykman, 1996). 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 melancholy selection, Prokofiev's "Russia Under the Mongolian Yoke," played at half speed (see Dykman, 1996). Participants listened to these music selections on cassette tapes over private headsets. Each tape lasted approximately 10 min. After listening to the music, participants responded to surveys titled "Pilot Music Ratings," similar to those for films in Study 1. Participants then made a series of positive and negative mood ratings and performed a map-drawing task as in Study 1.

Counterfactual thoughts. Participants were then handed back their written recalled life events pages, and they were asked to generate counterfactuals for the event with instructions that were virtually identical to those of Study 1. In contrast to Study 1, however, participants in Study 2 were asked to code their own counterfactual direction by marking a plus sign beside thoughts that might have made the described situation better (upward counterfactuals) and a minus sign beside thoughts that might have made the described situation worse (downward counterfactuals), a method that has been used successfully in prior research (Sanna, 1996; see also Roese & Olson, 1995).

Finally, to assess moods after counterfactual generation, we had participants respond to the series of positive and negative mood adjectives for a second time.

Results and Discussion

Counterfactual Thoughts

Participants in Study 2 provided reactions to recalled actual life events. The events typically included both negative and positive features (e.g., a relationship broke up but a new partner was found). Approximately 48% of events were interpersonal (e.g., making or losing friends) and approximately 33% were academic (e.g., getting good or bad grades). Some events (approximately 34%) were relatively major, such as moving across the country or getting expelled from a previous university; approximately 12% described a death of some kind. Other events (approximately 41%) were relatively minor, such as an argument with a roommate or skipping some classes.[3] Participants generated counterfactuals to these recalled events and coded their own direction (see Roese & Olson, 1995; Sanna, 1996).

The mean numbers of upward and downward counterfactual thoughts generated by participants were analyzed by a 2 (self-esteem) × 2 (mood) × 2 (counterfactual: upward, downward) ANOVA, with counterfactual as a within-subjects variable. There was a mood main effect, $F(1, 92) = 8.25$, $p < .01$ (positive, $M = 1.50$; negative, $M = 2.13$), and a Mood × Counterfactual interaction, $F(1, 92) = 4.00$, $p < .05$; this interaction indicates that more downward ($M = 1.85$) than upward ($M = 1.15$) counterfactuals were generated in positive moods, $t(92) = 2.79$, $p < .05$, and more upward ($M = 2.22$) than downward ($M = 2.05$) counterfactuals were generated in negative moods (this latter finding did not quite reach significance, $t(92) = 1.23$, *ns*). There also was a Self-Esteem × Counterfactual interaction, $F(1, 92) = 6.84$, $p < .03$; HSE participants generated more downward ($M = 2.32$) than upward ($M = 1.48$) counterfactuals, but LSE participants generated more upward ($M = 1.89$) than downward ($M = 1.58$) counterfactuals.

These lower order effects, however, must also be viewed in light of the significant three-way interaction, $F(1, 92) = 11.03$, $p < .01$, which is depicted in Table 2. In the positive-mood condition, both self-esteem groups generated more downward than upward coun-

[3] We also tried to assess whether the type of recalled event further modified our results. To do this, we had judges code for event type. The types were interpersonal versus academic events and major versus minor events. (Because almost all events included both negative and positive features, we could not code effectively on a negative versus positive dimension.) We used these codings as additional variables in our analyses of counterfactuals. Event type did not modify our results, and thus we only report our results for counterfactual direction in Study 2 averaged over all event types. However, we must acknowledge the sometimes small cell sizes we encountered when we classified further by event type. This, of course, leaves open the possibility that event type might provide further qualifications, but we just did not find any evidence for it in Study 2 (see Kasimatis & Wells, 1995, however, who also found no self-esteem differences for valenced event types). In any case, these event-type codings are not critical to our hypotheses. In fact, because we found differences averaged over all types of events, this may make our results particularly impressive (i.e., any further moderating event-type variables would have likely only worked against our hypotheses).

terfactuals, significantly so for those with LSE, $t(92) = 2.51$, $p < .01$; the number of upward and downward counterfactuals did not differ between the two self-esteem groups. In the negative-mood condition, HSE participants generated more downward than upward counterfactuals and LSE participants generated more upward than downward counterfactuals, both $ts(92) > 3.33$, $ps < .01$; upward and downward counterfactuals also differed between the two self-esteem groups, $ts(92) > 2.13$, $ps < .05$.

The overall pattern of results in Study 2 and, with only one exception (HSE–Positive Mood), the significant differences were identical to those of Study 1, providing important evidence about the generalizability of our findings to recalled actual life events and not just imagined scenarios. The consistency across the two studies might be particularly impressive given that in Study 2 we asked participants to generate counterfactuals in response to actual life experiences, but we did not specify what these experiences should be. In other words, mood influenced counterfactual direction despite the varying nature of the recalled events (see Footnote 3). The somewhat weaker effects in Study 2 as compared with Study 1 thus may be due in part to the introduction of uncontrolled variability. Nevertheless, we felt it important to test our hypotheses in reaction to real experiences, which we felt would greatly increase the generality of our research.

Mood

Pre- and postmoods. Another purpose of Study 2 was to examine the effects of counterfactual generation on subsequent moods. Participants' responses to the mood adjectives were first scored as in Study 1 for ratings made both before and after counterfactual generation (Cronbach's αs = .92 and .86, respectively). A 2 (self-esteem) × 2 (mood) × 2 (time: before, after) ANOVA was then conducted on the averaged mood adjectives, with time as a within-subjects variable. There are several important aspects to our mood measures (see Table 3). First, the precounterfactual, before-mood means (first and third rows of Table 3) can be used as a mood manipulation check. There was an overall mood main effect, $F(1, 92) = 12.10$, $p < .001$ (positive, $M = 5.06$; negative, $M = 3.89$). Moreover, a contrast using only before-mood means indicated that participants felt better after listening to the positive ($M = 4.98$) than the negative music ($M = 3.93$), confirming the effectiveness of our musical mood manipulations, $t(92) = 5.48$, $p < .01$.

Second, our pre- and postcounterfactual measurement of moods allowed for a test of whether participants' moods changed over time. There was a significant Self-Esteem × Time interaction, $F(1, 92) = 4.14$, $p < .05$, which was qualified by a three-way interaction, $F(1, 92) = 4.13$, $p < .05$. In the positive-mood condition, although participants felt somewhat more positive after generating more downward than upward counterfactuals (as compared with the results in Table 2), these differences were not significant. However, significant changes did occur in the negative-mood conditions. HSE participants felt better after generating counterfactuals than before, $t(92) = 2.73$, $p < .05$; it was also in this condition that HSE participants generated more downward than upward counterfactuals. In contrast, LSE participants felt worse after generating counterfactuals than before, $t(92) = 3.01$, $p < .05$; it was also in this condition that they generated more upward than downward counterfactuals (see Table 2).

Table 2
Mean Number of Upward and Downward Counterfactual Thoughts by Mood and Self-Esteem for Study 2

Mood	Self-esteem: High	Self-esteem: Low
Positive		
Upward counterfactuals	1.19	1.11
Downward counterfactuals	1.74	1.97
Negative		
Upward counterfactuals	1.78	2.67
Downward counterfactuals	2.91	1.19

Table 3
Mean Mood Rating Both Before and After Generating Counterfactuals by Mood and Self-Esteem for Study 2

Mood	Self-esteem: High	Self-esteem: Low
Positive		
Before	5.01	4.95
After	5.19	5.12
Change	+0.18	+0.17
Negative		
Before	3.90	3.96
After	5.20	2.53
Change	+1.30	−1.43

Mediational analyses. To further assess whether counterfactual direction may mediate the link between pre- and postcounterfactual moods, we conducted an additional ANOVA on mood-change scores, with counterfactual direction used as a covariate. To accomplish this, we first created an index of mood change by subtracting pre- from postcounterfactual moods (see Table 3). A 2 (self-esteem) × 2 (mood) ANOVA on mood change revealed a self-esteem main effect, $F(1, 96) = 6.35$, $p < .05$, and a Self-Esteem × Mood interaction, $F(1, 96) = 6.31$, $p < .05$. An index of counterfactual direction was then constructed by subtracting the mean number of upward counterfactuals from the mean number of downward counterfactuals that were generated by each participant (from Table 2), and an analysis of covariance (ANCOVA) was performed. If counterfactual direction functions as a potential mediating variable, then the effects of the independent variables on mood change should become nonsignificant (or be significantly reduced) when counterfactual direction is covaried out. This occurred for the self-esteem main effect and two-way interaction, both $Fs(1, 95) < 2.01$, *ns*. Our ANCOVA results thus provide further evidence that the direction of generated counterfactuals may be producing the observed mood changes.[4]

[4] Some additional conditions were run after Study 2 was completed to further assess the role of counterfactual direction in mood repair. To do this, we ran 17 HSE (RSES, $M = 26.22$) and 19 LSE (RSES, $M = 16.29$) participants through the procedures of Study 2, but they did not generate counterfactuals. Instead, when participants were handed back their recalled life events, they were asked simply to read them over to make spelling and grammatical corrections. A 2 (self-esteem) × 2 (mood) × 2 (time)

Study 3: Agreement and Response Latencies

For imagined scenarios (Study 1) and for recalled actual life events (Study 2), we found that good moods led to more downward than upward counterfactuals, whereas bad moods led to more upward than downward counterfactuals. However, one particularly intriguing qualification to this pattern was that HSE participants generated more downward than upward counterfactuals in response to negative moods, perhaps suggesting a strategic mood repair. This possibility was further supported by the fact that HSE participants felt better after generating more downward than upward counterfactuals when in negative moods in Study 2. Our third study was conducted as an effort to further explicate whether HSE and LSE persons differ in their default, or automatic, counterfactual reactions to moods. On this point, as we have described previously, Isen (1984, 1987; Clark & Isen, 1982) has suggested that mood-congruent effects may be guided by automatic processing, but mood-incongruent effects may be guided by more controlled or effortful processing. To the extent that mood regulation involves an effortful process (e.g., Cialdini, Darby, & Vincent, 1973; Erber & Erber, 1994), HSE participants may put more energy into generating counterfactuals in the negative mood conditions. Bad moods might automatically elicit upward counterfactuals, which are overridden by downward counterfactuals to repair the bad mood. However, this mood-repair strategy may be most likely among HSE persons.

To explore this possibility, we took a slightly different approach in Study 3. Roese and Olson (1997) have shown that affect, manipulated by successes or failures, can influence counterfactual activation. Participants agreed to a counterfactual prompt ("my score could have been much different") faster after failures than after successes. To the extent that counterfactuals were generated on-line, shorter response latencies (e.g., Smith, 1984; Smith & Miller, 1983; Srull, 1984) may indicate stronger activation. If this is true, we might expect that moods will differentially influence the speed at which counterfactuals are made by HSE and LSE participants. However, we have thus far focused only on how moods may influence counterfactual direction but not counterfactual activation, and these two processes may be distinct (Roese, 1997). Assessing activation may further distinguish the motives of HSE and LSE persons, suggesting more automatic or more effortful responses under different mood conditions. If participants respond to counterfactual statements quickly, then this may indicate that well-rehearsed, routine processing is involved. In contrast, slower response latencies may indicate that more effortful processing is involved. For example, if HSE persons respond to downward counterfactuals more slowly when in negative than positive moods, this may suggest a relatively more controlled or strategic process. The design of Study 3 was a 2 (self-esteem) × 3 (mood) × 2 (counterfactual) between-subjects factorial.

Method

Participants

Participants were 78 HSE (M = 27.14) and 78 LSE (M = 16.99) students who were selected from the upper and lower thirds on the RSES, which had been administered to 559 introductory psychology students as part of a mass survey session. Participants were randomly assigned with the constraint that there be equal numbers of HSE and LSE participants in each condition.

Procedure

As in our previous studies, participants signed up for what was purported to be a series of tasks being tested for possible inclusion in future research. Participants were tested individually, and the experimenter who tested them was not aware of their self-esteem levels.

Anagram task. Participants were seated at a table with a personal computer, and they were told that as a first task they would perform some anagram items. Instructions were presented by the computer. Participants read that the 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 emphasized 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 could work on the anagrams in any order that they chose. The anagrams were presented as an important measure of ability and aptitude. Prior to beginning the task, participants made a series of choices regarding the format of their anagrams, including topic, list, test length, time, and possibility of buying clues (see Sanna & Turley, 1996). Of course, all participants actually worked with the same list. These different possibilities were merely proposed to introduce possible mutation points without explicitly prompting them (Sanna & Turley, 1996; see also Roese & Olson, 1997).

All participants worked on a set of 20 anagrams 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). Each anagram had no repeated letters, was not plural, and had only one correct solution. The 20 anagrams were numbered and presented together on the computer screen, and participants recorded their answers on a corresponding response sheet. Participants were allowed 9 min to work on the complete set of 20 anagrams. Our prior research has shown that participants are unsure of how well they perform on this intermediate difficulty anagram task without explicit normative feedback (Sanna, 1996, 1997; Sanna & Turley, 1996). However, in Study 3, unlike in our prior research, we did not provide any normative performance feedback to participants but instead manipulated moods directly using film clips as we had done in Study 1.[5]

Mood induction. As a second task, participants in the positive and negative mood conditions watched and rated clips from three films, iden-

ANOVA on the mood measures revealed only a mood main effect, $F(1, 32) = 6.86$, $p < .05$ (positive, M = 5.03; negative, M = 3.97), indicating that our mood manipulations were again effective but that moods did not change over time. We also conducted specific contrasts between no-counterfactual participants and the data in Table 3. In the negative mood conditions, HSE participants felt better after generating counterfactuals (M = 5.20; see Table 3) than when they did not (M = 4.04), whereas LSE participants felt worse after generating counterfactuals (M = 2.53; see Table 3) than when they did not (M = 4.00), both $ts(34) > 2.33$, $ps < .05$. No other contrasts between participants who generated counterfactuals and those who did not were significant within levels of self-esteem and mood. These findings further suggest that moods do not change when not accompanied by intervening counterfactual generation, and that the primary differences seem to occur in response to bad moods.

[5] Participants answered an average of 9.56 anagrams correctly, which is close to half of the number of available items on the anagram list. The fact that participants answered about half of the items only serves to further support an argument that their performance quality was relatively ambiguous in the absence of explicit performance feedback (see also Sanna, 1996, 1997). Similar averages were obtained in Study 4 (M = 10.01) as well.

tical to those used in Study 1. In addition, in Study 3 we added a control condition in which no film clips were shown. Instead, participants in this condition were told that there was some trouble with the video equipment, so the movies would be skipped in the session; these participants were told that they would still be able to complete the other studies that did not involve the movie ratings (see Sanna et al., 1996). All participants then responded to the series of positive- and negative-mood adjectives and a map-drawing task, identical to those of Studies 1 and 2.

Counterfactual thoughts. As a final task, participants were asked to respond to a series of upward and downward counterfactual statements presented by computer. To accomplish this, participants read the following instructions:

> As part of a final study about people's reactions to various life events, we will provide you with a series of statements about your anagram performance. These statements represent thoughts that some people might have in reaction to their anagram performance. We would like you to think back on your anagram performance and respond to each statement by either agreeing or disagreeing with it by pressing the appropriate keys on your computer keyboard. You have as much time as you like to complete this task, but please make sure that your responses reflect your true thoughts about your performance on the anagram task.

Participants in the *upward counterfactual* condition were presented with a series of 10 statements about a better performance (e.g., "I might have performed better on the anagram task if only I had more time" and "If only I had gotten some easier anagram items, I might have performed a lot better"). Participants in the *downward counterfactual* condition were presented with a series of 10 parallel statements about a worse performance (e.g., "I might have performed worse on the anagram task if only I had less time," etc.). The sets of counterfactual statements were actually constructed from those provided to us by participants in our previous research using this task (Sanna, 1996, 1997; Sanna & Turley, 1996) and were modified for use in this study. Within each condition, the 10 counterfactual statements were presented to participants in random order. To assess activation, participants agreed or disagreed with each statement by pressing the appropriate keys on their computer keyboard. The *G* and *H* keys were marked with a red *A* for agree and a blue *D* for disagree, respectively. Response times and agreement were recorded.

Results and Discussion

Manipulation Check

Ratings of the mood adjectives were reverse scored and averaged (Cronbach's $\alpha = .90$). A 2 (self-esteem) × 3 (mood) × 2 (counterfactual) ANOVA revealed only a mood main effect, $F(2, 144) = 15.18$, $p < .001$. Participants who viewed the happy films ($M = 5.65$) felt better than those who viewed the sad films ($M = 3.74$), $t(144) = 5.67$, $p < .01$; in addition, control mood participants ($M = 4.70$) fell between and differed from both positive- and negative-mood participants, $ts(144) > 3.51$, $ps < .01$.

Statement Agreement

The mean number of agreed-to counterfactual statements was submitted to a 2 (self-esteem) × 3 (mood) × 2 (counterfactual) ANOVA.[6] There was a mood main effect, $F(2, 144) = 4.08$, $p < .05$; more statements were agreed with by negative- ($M = 7.5$) than positive-mood ($M = 6.8$) participants, $t(144) = 3.05$, $p < .01$, but no-mood ($M = 7.1$) participants did not differ from either group. There also were Mood × Counterfactual, $F(2, 144) = 4.93$, $p < .01$, and Self-Esteem × Counterfactual, $F(1, 144) = 7.11$, $p < .01$, interactions. These lower order effects, however, were qualified by the three-way interaction, $F(2, 144) = 5.79$, $p < .01$, which is depicted in Table 4.

In the negative-mood condition, HSE participants agreed to more downward than upward counterfactuals, but LSE participants agreed to more upward than downward counterfactuals, both $ts(144) > 2.80$, $ps < .05$. That HSE and LSE participants differed in their reactions to negative moods complements the results of our first two studies by demonstrating that this pattern extends not only to generated counterfactuals, but also to agreement with already-provided counterfactual statements. When in a positive mood, also consistent with our first two studies, both HSE and LSE participants agreed with more downward than upward counterfactuals, both $ts(144) > 2.14$, $ps < .05$.

In the control mood condition, the number of agreed-to upward and downward counterfactual statements did not differ from each other for either HSE or LSE participants. However, the number of agreed-to statements of control mood participants may help to clarify the relationship between mood and counterfactuals beyond our first two studies. For HSE persons, downward counterfactuals were agreed to more when participants were in a negative mood ($M = 8.4$) than in either a control ($M = 7.0$) or a positive ($M = 7.5$) mood, both $ts(144) > 2.11$, $ps < .05$. For LSE persons, more upward counterfactuals were agreed to when participants were in a negative mood ($M = 7.9$) than in either a control ($M = 6.9$) or a positive ($M = 6.2$) mood, both $ts(144) > 1.99$, $ps < .05$. These findings suggest that negative moods may have the most influence, but that which direction is affected depends on a participant's self-esteem. For HSE persons, downward counterfactuals are affected most, but for LSE persons, upward counterfactuals are affected most. Control mood means fell between those of the positive- and negative-mood conditions on these measures, as might be expected on the basis of a similar pattern obtained in our mood manipulation check, but they did not differ from positive-mood means. Also, HSE participants agreed to fewer upward counterfactuals when in a positive mood ($M = 6.3$) than when in control mood ($M = 7.3$), $t(144) = 2.15$, $p < .05$, perhaps suggesting that positive moods additionally have a suppressing effect on upward counterfactuals for HSE persons.

Response Latency

We recorded response latencies as a measure of effortful processing. A 2 (self-esteem) × 3 (mood) × 2 (counterfactual)

[6] We also conducted an ANOVA on the mean number of disagreed-with counterfactual statements. Not surprisingly, because these means essentially are the obverse of those for agreement (i.e., for HSE participants in positive moods, upward counterfactual mean agreement is 6.3 and upward counterfactual mean disagreement is 3.7), a virtually identical pattern of results emerged: For mood, $F(2, 144) = 3.93$, $p < .05$; for Mood × Counterfactual, $F(2, 144) = 4.75$, $p < .01$; for Self-Esteem × Counterfactual, $F(1, 144) = 6.86$, $p < .05$; and for Self-Esteem × Mood × Counterfactual, $F(2, 144) = 5.58$, $p < .01$. Because these means are not completely independent of those for agreement, and because the pattern of results is so similar, we discuss only the results for agreement in the text. Similar outcomes occurred in Study 4, and thus we discuss only agreement in that study as well.

Table 4
Mean Agreement and Response Latencies for Upward and Downward Counterfactual Statements by Mood and Self-Esteem for Study 3

	Self-esteem			
	High		Low	
Mood	Mean agreement	Response latency (s)	Mean agreement	Response latency (s)
Positive				
Upward counterfactuals	6.3	6.30	6.2	6.33
Downward counterfactuals	7.5	5.32	7.2	5.39
Negative				
Upward counterfactuals	6.9	5.40	7.9	5.37
Downward counterfactuals	8.4	7.98	6.6	5.44
Control				
Upward counterfactuals	7.3	5.94	6.9	5.80
Downward counterfactuals	7.0	5.82	6.8	6.00

Note. Mean agreement is the number of agreed-to statements.

ANOVA revealed a self-esteem main effect (HSE, $M = 6.12$ s; LSE, $M = 5.72$ s), $F(1, 144) = 4.03$, $p < .05$.[7] There also was a Mood × Counterfactual interaction, $F(2, 144) = 10.71$, $p < .01$, in which positive-mood participants agreed more quickly to downward ($M = 5.35$ s) than upward ($M = 6.30$ s) counterfactuals, $t(144) = 2.79$, $p < .05$, but negative-mood participants agreed more quickly to upward ($M = 5.39$ s) than downward ($M = 6.67$ s) counterfactuals, $t(144) = 3.65$, $p < .05$. Further, there was a Self-Esteem × Mood interaction, $F(2, 144) = 4.77$, $p < .01$, qualified by the three-way interaction, $F(2, 144) = 5.14$, $p < .01$, which is depicted in Table 4.

Specific contrasts indicated that both self-esteem groups agreed more quickly to downward than upward counterfactuals when in positive moods, significantly so for HSE participants, $t(144) = 1.99$, $p < .05$, and marginally so for LSE participants, $t(144) = 1.91$, $p < .09$. In contrast, when in negative moods, HSE participants agreed more slowly with downward counterfactual statements than was the case for agreement in any of the other three negative mood cells, all $ts(144) > 4.99$, $ps < .01$. Mean response latencies did not differ within the control mood condition. However, comparisons with the control mood condition may help to further clarify the nature of our results. For HSE participants, response latency for participants agreeing to downward counterfactuals in negative moods ($M = 7.98$ s) was greater than that for control mood ($M = 5.82$ s) participants, $t(144) = 4.39$, $p < .01$. Comparisons of other control mood participant response latencies within counterfactual direction and level of self-esteem revealed no other differences. The agreement and the latency data of Study 3 further suggest that HSE persons may manifest more effortful responses to deal with negative moods.

Study 4: Cognitive Load and Counterfactual Direction

Our fourth study was conducted to advance the results of our first three studies and to further elucidate the responses of HSE and LSE persons. To the extent that mood regulation involves an effortful process (e.g., Cialdini et al., 1973; Clark & Isen, 1982; Erber & Erber, 1994), then generating counterfactuals under a cognitive load may thwart such efforts. That is, several lines of research indicate that making judgments under a cognitive load results in people relying less on effortful processing strategies (e.g., Bodenhausen, 1993; Gilbert, Pelham, & Krull, 1988; Mackie & Worth, 1989). For example, Mackie and Worth (1989) manipulated cognitive load by limiting the time available to participants considering a persuasive message and found that participants showed a greater reliance on heuristic cues (a less effortful strategy) when forming judgments than when no such time limits were imposed. Applying this reasoning to our research may help to further distinguish more effortful from more automatic processing of counterfactuals. We predicted that a high cognitive load would interfere with downward counterfactual agreement for HSE participants in negative moods while leaving the previously observed pattern of results for participants in other conditions intact. The design of Study 4 was a 2 (self-esteem) × 2 (counterfactual) × 2 (load: high, low) between-subjects factorial. Because the two self-esteem groups differed mainly in response to negative moods in our first three studies, in Study 4 we focused only on participants' reactions to negative moods.

Method

Participants

Participants were 40 HSE ($M = 25.03$) and 40 LSE ($M = 16.99$) students who were selected from a mass screening of 354 introductory psychology students. They were randomly assigned to conditions with the

[7] We conducted an additional 2 (self-esteem) × 3 (mood) × 2 (counterfactual) × 2 (response: agree, disagree) ANOVA, with response as a within-subjects variable, on average response latency for agreement and disagreement. See Lunney (1970) or Seeger and Gabrielson (1968) for an affirmation of the appropriateness of using ANOVA procedures when dichotomizing data in this way. However, there were no main effects or interactions with response type (see Roese & Olson, 1997, for a similar finding). Thus, within each cell of Table 4, we report response latencies collapsing over agreement and disagreement. Similar outcomes occurred in Study 4, and thus we retained a similar analysis strategy in that study as well.

Table 5
Mean Agreement and Response Latencies for Upward and Downward Counterfactual Statements by Self-Esteem and Cognitive Load for Study 4

	Self-esteem			
	High		Low	
Cognitive load	Mean agreement	Response latency (s)	Mean agreement	Response latency (s)
Low				
Upward counterfactuals	6.9	5.43	8.0	5.33
Downward counterfactuals	8.1	7.28	6.7	5.40
High				
Upward counterfactuals	7.9	4.90	8.2	4.51
Downward counterfactuals	6.8	4.83	6.7	4.67

Note. Mean agreement is the number of agreed-to statements.

constraint that there be equal numbers of HSE and LSE participants in each condition.

Procedure

The procedures for Study 4 were similar to Study 3, with some exceptions.

Anagram task. Participants performed an anagram task that was identical to that of Study 3.

Mood induction. However, all participants in Study 4 watched only the negative mood film clips.

Counterfactual thoughts. Participants responded to a series of upward and downward counterfactual statements that were presented by computer and that were identical to those in Study 3.

Cognitive load. However, unlike in Study 3, in Study 4 we also manipulated cognitive load. To accomplish this, in the *high-load* condition, we imposed a time limit on participants' responding (cf. Mackie & Worth, 1989). Participants in this condition read that they would have only 5 s to respond to each counterfactual statement. This time limit was determined on the basis of pilot testing to be a minimally sufficient amount of time to read and respond to each statement; it also was an amount of time slightly quicker than the fastest mean latency found when no time limit was imposed in Study 3. As each statement was presented, a timer that counted 0.10-s increments also appeared at the top of the screen to let participants know how much time they had left to respond.[8] In the *low-load* condition, no time limit was imposed, as in Study 3. The procedures of Study 4 otherwise followed those of Study 3.

Results and Discussion

Manipulation Check

The positive and negative mood adjectives were appropriately reverse scored and averaged (Cronbach's $\alpha = .88$). In Study 4, as previously described, we used only a negative-mood manipulation. Consistent with the effectiveness of this manipulation, a 2 (self-esteem) × 2 (counterfactual) × 2 (load) ANOVA on the mood index revealed no significant differences by condition, and negative mood was comparable with that of our previous studies (overall, $M = 3.50$).

Statement Agreement

A 2 (self-esteem) × 2 (load) × 2 (counterfactual) ANOVA on the number of agreed-to counterfactual statements revealed a main effect for counterfactual (upward, $M = 7.75$; downward, $M = 7.07$), $F(1, 72) = 6.83$, $p < .05$. There were also Self-Esteem × Counterfactual, $F(1, 72) = 7.88$, $p < .01$, Load × Counterfactual, $F(1, 72) = 5.85$, $p < .05$, and three-way, $F(1, 72) = 4.13$, $p < .05$, interactions. The three-way interaction means are presented on top within each cell of Table 5.

Under low load, HSE participants agreed to more downward than upward counterfactuals, whereas LSE participants agreed to more upward than downward counterfactuals, $ts(72) > 2.31$, $ps < .05$. These findings replicate those of Study 3 for reactions of HSE and LSE participants to negative moods when no time limits were imposed. However, under high load with an imposed time limit, a completely different pattern emerged: Both self-esteem groups agreed to more upward than downward counterfactual statements, $ts(72) > 2.12$, $ps < .05$. A comparison of results from our low- and high-load conditions of Study 4 adds greatly to what is known from past research and even from the findings of Studies 1–3. In particular, it seems that although upward counterfactuals may be a default response to negative moods in general, HSE persons may have learned to override this default and are able to generate downward counterfactuals to repair negative moods.

Response Latency

A 2 (self-esteem) × 2 (load) × 2 (counterfactual) ANOVA on response latency revealed three main effects: self-esteem, $F(1, 72) = 6.36$, $p < .05$; counterfactual, $F(1, 72) = 4.00$, $p < .05$; and load, $F(1, 72) = 20.41$, $p < .001$. This latter effect in particular is not surprising because it indicates that overall, participants responded faster under high load ($M = 4.72$ s; i.e., when there was a 5-s time limit) than under low load ($M = 5.86$ s; i.e., when there was no time limit). However, these effects must be viewed within the context of a significant three-way interaction, $F(1, 72) = 4.01$, $p < .05$ (see Table 5).

[8] It might be argued that having a timer appear on the screen would be distracting to our participants, and that their attention may have been divided between responding and the timer. We note, however, that if this was the case, then it would only serve to further our manipulation of cognitive load, as similar procedures using divided attention have themselves been used independently to manipulate cognitive load in past research (e.g., Gilbert et al., 1988).

Within the high-load conditions, response latencies did not differ among the cells, $ts(72) \leq 0.76$, *ns,* as might be expected given the imposed time limit. However, in the low-load conditions and in replicating the results of Study 3, HSE participants took longer to agree to downward counterfactuals ($M = 7.28$ s) than was the case for any other group, $ts(72) > 3.65$, $ps < .05$. Thus, while replicating Study 3 in the low-load conditions, Study 4 introduced an additionally intriguing twist: A comparison of the high- and low-load conditions provides further evidence consistent with the notion that HSE participants may actively and effortfully override default upward counterfactuals with downward counterfactuals when in negative moods as a strategic attempt at mood repair.

General Discussion

Taken together, the four studies reported in this article provide converging evidence that moods and self-esteem can influence counterfactual direction. This was shown for responses to hypothetical situations (Study 1), recalled actual life events (Study 2), and laboratory tasks (Studies 3 and 4). In addition, these results were obtained with film (Studies 1, 3, and 4) and music (Study 2) mood manipulations, with judge- (Study 1) and participant-coded (Study 2) counterfactuals, and for agreement to already-provided counterfactual statements (Studies 3 and 4). As such, these four studies help to extend what is known about the relationship between moods and counterfactuals and help to increase an understanding of the underlying motives of people with HSE and LSE. We find it heuristically useful to conceptualize our results in terms of the variables depicted in Figure 1.

Moods and Counterfactual Direction: Reciprocal Antecedents and Consequences

One goal of our research was to assess the possible influence of moods on counterfactual direction. In prior research, moods have been viewed primarily as a consequence of counterfactual direction; that is, moods have been measured as dependent variables. In general, downward counterfactuals lead to positive moods, whereas upward counterfactuals lead to negative moods (e.g., Markman et al., 1993; Roese, 1994; Sanna, 1996; cf. Sanna, 1997). Without denying the importance of past research or the influence of counterfactual direction on moods, our present research greatly extends and elaborates on these findings by indicating that the opposite causal relationship is also valid. That is, directly manipulated moods (i.e., as independent variables) can also serve as antecedents to counterfactual direction. As depicted in Figure 1 and as outlined in our introduction, we have proposed several possibilities, all of which indicate that moods may influence counterfactuals through their informational value by causing people to ask "How do I feel about it?" In this vein, Sanna, Meier, and Turley-Ames (1998) have provided additional evidence in support of the feelings-as-information view. In particular, using an external mood-attribution paradigm (e.g., Schwarz & Clore, 1983), these researchers found that moods did not influence counterfactuals when their sources could be externally attributed. However, we do not wish to imply that moods may have only one type of influence on counterfactuals, a point to which we return later in our General Discussion. As our findings indicated and as depicted in Figure 1, positive moods led to downward counterfactuals and negative moods led to upward counterfactuals when considered overall. These findings might be particularly intriguing because just as past research had shown that upward counterfactuals lead to negative moods and downward counterfactuals lead to positive moods, our present research indicates that negative moods lead to upward counterfactuals and positive moods lead to downward counterfactuals, mirroring the relationship demonstrated previously. Our present research, when coupled with the findings of previous studies, thus strongly suggests that moods and counterfactual direction may serve as reciprocal antecedents and consequences of each other.

Self-Esteem as a Moderator of Mood Influences on Counterfactual Direction

A second goal of our research was to assess self-esteem as a moderator of mood influences on counterfactual direction. Our results parallel self-esteem responses to general positive and negative life experiences. We found that self-esteem differences were pronounced when confronting negative events (see also Brown, 1991; Brown & Dutton, 1995). Both HSE and LSE participants generated (Studies 1 and 2) or agreed to (Study 3) more downward than upward counterfactuals when in positive moods, and they did so more quickly (Study 3). This suggests that downward counterfactuals may be the general or default reaction to positive moods,

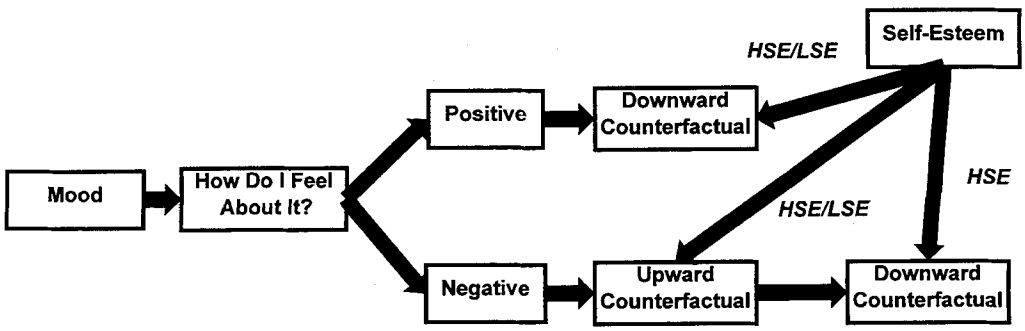

Figure 1. Overview and descriptive model of the present research. HSE = high self-esteem; LSE = low self-esteem.

and they may occur automatically in response to such moods. This pattern is consistent with arguments that HSE and LSE persons react similarly to positive events but extends what is known to moods and counterfactual direction. As depicted in Figure 1, both HSE and LSE persons may react similarly to positive moods by thinking more about downward counterfactuals. In contrast, HSE participants generated (Studies 1 and 2) or agreed to (Study 3) more downward than upward counterfactuals when in negative moods, but LSE persons generated or agreed to more upward than downward counterfactuals when in such moods. As depicted in Figure 1, only HSE participants generated or agreed to downward counterfactuals when in negative moods. HSE persons also took longer to agree with downward counterfactuals in negative moods (Study 3; see also the low-load conditions of Study 4), suggesting that downward counterfactuals for HSE persons may be a more effortful and strategic attempt to offset the negative mood or to repair mood. Consistent with this notion, in Study 2 HSE persons also felt better after generating downward counterfactuals when in negative moods.

Further Implications and Conclusions

We believe that our research may have several important additional implications and may further functional views of counterfactuals. As we mentioned, the possible influence of moods on counterfactual thinking has been virtually ignored. However, Roese and Olson (1997) have recently shown that success and failures may influence moods and counterfactual activation. In their research, participants agreed to a counterfactual prompt ("my score could have been much different") faster after failures than after successes. This raises the intriguing possibility that many of the outcome effects observed in previous research may actually be the result of the mood states they occasion (see also Brown & Mankowski, 1993; Roese & Olson, 1997). For example, failures have been shown to elicit upward counterfactuals and successes have been shown to elicit downward counterfactuals (Markman et al., 1993). If failures produce negative moods and successes produce positive moods, then the results of these outcome studies are consistent with our present arguments and findings. In other words, people may not be responding to the failures or successes per se but to the sadness and happiness they engender. It is noteworthy, however, that previous outcome valence manipulations could have altered other conceptually distinct variables in addition to moods, such as perceptions of control or self-efficacy (cf. Sanna, 1997), among others. Accordingly, our present research provides more direct evidence that affect, manipulated directly and independently, may serve as information that influences counterfactual thought processes.

This research may also help to further illuminate the coping responses of people with HSE and LSE. Several theorists have described the various ways that people try to repair negative moods. Isen (1984, 1987; Clark & Isen, 1982) was one of the first to describe the possibility of mood repair, noting that reactions to negative moods are often quite complex. Moreover, mood repair may involve a more controlled and effortful process (Clark & Isen, 1982; see also Forgas, 1995; Erber & Erber, 1984). Our results, particularly those of Studies 3 and 4, support these notions, but they also suggest that differences in self-esteem further modify the types of processing engaged when negative moods are experienced. HSE persons try to offset negative events by using self-enhancement strategies (e.g., Brown et al., 1988; Wheeler & Miyake, 1992) more than do LSE persons (Brown & Mankowski, 1993). Downward counterfactuals thus appear to be another effective strategy of mood repair that is part of the arsenal of those with HSE. This reasoning further connects our studies to those that have demonstrated other cognitive enhancement strategies (e.g., Parrott & Sabini, 1990; Smith & Petty, 1995) and with similar arguments that downward social comparisons (Wills, 1981) are self-enhancing (Collins, 1996; Taylor & Schneider, 1989). With regard to counterfactuals, Roese and Olson (1993) found that HSE persons mutated their own actions after success and LSE persons mutated their own actions after failure, and Kasimatis and Wells (1995) found that HSE was positively correlated with downward counterfactuals and negatively correlated with upward counterfactuals. Each of these findings, along with our own, are suggestive of self-serving or self-enhancement motives among HSE individuals. However, even HSE persons must have sufficient time to override default upward counterfactuals to repair moods by thinking about downward counterfactuals. In other words, upward counterfactuals may be a default; this is particularly likely for negative moods but not positive moods. HSE persons may use downward counterfactuals to alleviate bad moods, but even they must have enough motivation, cognitive capacity, or time (low cognitive load), or they will a display the default upward counterfactual reaction (see Figure 1).

Additionally, our results moved beyond and diverged from prior research in a few important ways. Like Roese and Olson (1997), we found that negative moods activated more counterfactuals overall than positive moods. More counterfactuals were generated (Studies 1 and 2) and agreed to (Study 3) when in negative than positive moods. In Study 3, more counterfactuals were also agreed to for negative- than no-mood participants. These findings suggest that negative moods can be one prime activator of counterfactual thinking (Gleicher et al., 1990; Sanna & Turley, 1996). It is thus interesting to speculate that upward counterfactuals may be a default response (see Roese & Olson, 1995). The interactions in our research (Studies 1–3) in which negative moods induced more upward than downward counterfactuals provide evidence for this. Moreover, although specific comparisons were not significant in Study 3, both HSE and LSE participants agreed to more upward than downward statements in the no-mood condition. Study 4 adds to this, as more upward counterfactuals were agreed to by both HSE and LSE participants when they were placed under high cognitive load (i.e., when a time limit was imposed). However, we also found that downward counterfactuals resulted from good moods. Just as successes produced downward counterfactuals (Markman et al., 1993), so did good moods, and, as we mentioned previously, outcome valence may exert its influence through moods. The apparent convergence of positive mood manipulations and success experiences (cf. Roese & Olson, 1997) is itself intriguing. However, it is up to future research to determine the extent to which outcome valence and mood manipulations may be functionally equivalent. For instance, it is possible that directly induced positive moods may more strongly engender other motives, such as those of mood maintenance (e.g., Clark & Isen, 1982; Isen, 1987).

On this point, at the outset of our article we outlined several possibilities by which moods might influence counterfactuals. We

did not discriminate specifically among these alternatives here because each is based on the informational value of moods in related ways. One likely candidate was that bad moods may serve as information that there is a problem (e.g., Frijda, 1988; Schwarz, 1990). Other possibilities were that moods may make accessible corresponding self-thoughts (e.g., Bower, 1991; Isen et al., 1978; Sedikides, 1992), or that they may serve as information or input more broadly (e.g., Martin et al., 1993; Sanna et al., 1996; Schwarz & Clore, 1996). Each of these views can make similar predictions for negative moods. Bad moods may lead to upward counterfactuals, possibly because bad moods signal trouble or serve as an anchor from which upward counterfactuals are generated. That good moods also led to more downward counterfactuals, however, is perhaps more readily predicted by proposals that such moods induce favorable states, which people wish to maintain (e.g., Clark & Isen, 1982; Isen, 1987). HSE persons may also be more likely than LSE persons to use mood-repair strategies when in bad moods. However, we believe that it may be imprudent at this early stage to limit ourselves to even these interpretations. Other alternatives may be possible. Our findings might also implicate a motive to resolve belief inconsistency (e.g., Swann, 1990). For example, for HSE persons, bad moods may be undesirable and inconsistent with self-beliefs, whereas for LSE persons, bad moods are undesirable but consistent with self-beliefs. Both groups may select upward counterfactuals when in bad moods because those moods are undesirable. However, HSE persons should have an additional motive to select downward counterfactuals to bolster or restore their positive self-beliefs; for LSE persons, upward counterfactuals are already consistent with their negative self-views and so no further cognitive machinations are necessary.[9] In fact, our view is that because the effects of moods on social judgments can be multiply determined (e.g., Sinclair & Mark, 1992), the same is probably true for counterfactuals. Future research examining which of these (or other) views best accounts for results in this area, combined with different motives (e.g., Helgeson & Mickelson, 1995), appears particularly valuable.

Finally, researchers have distinguished two major functions of counterfactuals that differ on the basis of direction: preparative and affective (e.g., Markman et al., 1993; Roese, 1994; Sanna, 1996, 1998). The coping literature has also identified activities aimed at self-improvement and affect regulation (Folkman & Lazarus, 1991; Lazarus & Folkman, 1984). Our research similarly suggests that counterfactuals can be functional. For example, HSE persons may be better able or more willing to cope with negative moods by using downward counterfactuals. HSE persons may also be more accustomed to successfully regulating their moods and so attempt such strategies more often (Smith & Petty, 1995). Our results thus may have applicability when assessing reactions to negative life events (Davis & Lehman, 1995) more generally. However, counterfactuals can be dysfunctional (Sherman & McConnell, 1995). If negative affect is both a cause and consequence of upward counterfactuals, then vicious cycles of bad moods may develop, which may be especially true for those with LSE. That LSE persons felt worse in Study 2 after generating upward counterfactuals when in negative moods is consistent with this argument. Perhaps it is the case that LSE persons are more distracted by their negative moods, resulting in failed mental control efforts, or they are more prone to "rebound effects" (e.g., Wagner, 1992). Although not assessing counterfactuals, Sedikides (1994) has proposed a "first, congruency; then, incongruency" hypothesis that may be relevant; sad moods influenced a first set of self-descriptions in a mood-congruent fashion but then influenced a second set of self-descriptions in a mood-incongruent fashion, suggesting later mood repair. Similar processes may have been occurring in our research. However, it may be that only HSE participants have learned to use this strategy effectively or that they are faster at it (i.e., perhaps over a longer time period even LSE participants will display this strategy). This "first-upward-then-downward" possibility (cf. Schwarz & Bless, 1992) and the strategy of assessing counterfactuals over time may be very promising. In the end, we hope that by assessing the relationship between moods, self-esteem, and counterfactual direction, our research will help to provoke further thoughts about these important and intriguing issues.

[9] We acknowledge an anonymous reviewer for suggesting this possibility.

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