

Responses to hedonically conflicting social comparisons: comparing happy and unhappy people

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Abstract

Two laboratory studies explored how self-rated unhappy and happy students balance hedonically conflicting social comparison information, and tested whether unhappy students would be relatively more sensitive to hedonically consistent unfavorable information. In both studies, students working in teams of four competed against one other team on a novel verbal task. First, unhappy participants showed relatively greater sensitivity to undiluted unfavorable feedback—about group standing (e.g. your team 'lost'; Study 1) and about group and individual standing (e.g. your team lost and you were placed last; Study 2). Second, unhappy students were more reactive than happy students to individual social comparison information in the context of relative group feedback. In Study 1, the moods and self-assessments of unhappy individuals (but not happy ones) after news of team defeat appeared to be buffered by the additional news of personal triumph. In Study 2, unhappy students showed relatively larger decreases in mood and ability assessments after unfavorable than after favorable individual feedback (i.e. ranking last versus first), regardless of whether they additionally learned that their teams had won or lost. The role of students' attributions and perceptions of their personal contribution was also explored. Implications of these findings for the links among social comparison, cognitive processes, and hedonic consequences are discussed. Copyright © 2001 John Wiley & Sons, Ltd.

Whether in individual or group competition, most people have experienced the joy or happiness of surpassing others and the pain or unhappiness of falling short. Participating in a triumphant sports team, receiving a high score in an entrance exam, or winning a promotion may make one feel delighted and gratified; conversely, playing in a floundering team, flunking an exam, or losing a job to someone else may make one feel hurt and dejected. Several decades ago, Festinger (1954) proposed that people have a 'drive' to evaluate their opinions and abilities and rely on social comparison information when absolute standards for assessing their performances are unavailable. Implicit in Festinger's theory is the notion that it is highly adaptive to seek social comparisons to interpret the meaning of one's performances and outcomes. Fortunately, information about how one compares with others is usually easily accessible. Most people receive a daily dose of social comparisons— with the circumstances,

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accomplishments, and setbacks of organizations, neighbors, spouses, and celebrities. Indeed, this information is so ubiquitous that it is not uncommon to be exposed to favorable and unfavorable social comparisons simultaneously — for example, to learn that one's track team was victorious in the latest statewide race, but that one's personal pace was the team's slowest. However, not everyone manages peer comparisons similarly. The question of how people differ in the ways that they might balance such hedonically conflicting information, as well as in their responses to intergroup and intragroup comparisons, is the focus of these studies.

HEDONIC CONSEQUENCES OF SOCIAL COMPARISON

In addition to desiring accurate self-assessments, people are concerned with making themselves feel better and may thus seek favorable social comparisons — with other individuals as well as out-groups — for the purpose of self-enhancement (Brickman & Bulman, 1977; Gruder, 1977; Hogg, 2000; Tajfel & Turner, 1986; Wills, 1991) or self-compensation (Wood, Giordano-Beech, Taylor, Michela, & Gaus, 1994). Numerous studies have documented people's preferences and uses of 'upward' versus 'downward' social comparison sources (e.g. Affleck & Tennen, 1991; Taylor & Lobel, 1989; Wood, Taylor, & Lichtman, 1985). It is important to note, however, that because social comparisons are universal and rarely avoidable, one often does not have the opportunity to choose the direction of one's comparisons — that is, to engage in 'active' social comparison (Wills, 1991). Thus, an important area of research examines the cognitive and affective consequences of social comparisons *after* they have been made.

A number of laboratory and field studies have supported the simple model that individual and intergroup upward comparisons are threatening to well-being and downward comparisons are self-enhancing (e.g. Brewer & Weber, 1994; Brown, Novick, Lord, & Richards, 1992; Hirt, Zillmann, Erickson, & Kennedy, 1992; Morse & Gergen, 1970; Runciman, 1966; Wheeler & Miyake, 1992). Follow-up research, however, has provided evidence for the conditional nature of these responses (Brickman & Bulman, 1977). For example, although some studies show that negative effects (i.e. increased negative affect and/or lowered self-evaluations) occur after passive comparisons with more fortunate others (e.g. Aspinwall & Taylor, 1993; Morse & Gergen, 1970; Wheeler & Miyake, 1992), other studies suggest that people 'under threat' feel comforted and inspired after upward contacts (e.g. Buunk, Collins, Taylor, VanYperen, & Dakof, 1990; Taylor, Aspinwall, Giuliano, Dakof, & Reardon, 1993; see also Gibbons & Gerrard, 1991).

A number of factors appear to determine whether one finds a social comparison threatening or inspiring — for example, whether one socially identifies with or feels close to the individual or group comparison target (Brewer & Weber, 1994; Brown *et al.*, 1992; Buunk & Ybema, 1997; Lockwood & Kunda, 1997; Tesser, 1988) or whether one feels a sense of control over the dimension under evaluation (Lockwood & Kunda, 1997; Major, Testa, & Bylsma, 1991). For example, after 'failing' a test, students who perceived little control over improving their performance reported more negative feelings in response to an upward comparison than those who perceived moderate control (Testa & Major, 1990). Such findings highlight the importance of examining cognitive processes, which are often highly variable and subjective, as playing a role in affective reactions to peer comparisons. Indeed, research has shown that responses to social comparisons differ depending on how favorably one interprets the relevant comparison information, the extent to which one blames or credits oneself for the outcome in question, and how important one considers a given comparison source or domain (Wood *et al.*, 1985; Tesser, Millar, & Moore, 1988; Wood, 1989). This implies that people may respond to social comparison information in different ways — and reap

different levels of reward or cost — depending on their circumstances and dispositions (cf. Gibbons & Buunk, 1999).

INDIVIDUAL DIFFERENCES

Both empirical evidence and anecdotal experience suggest that social comparison is an active, flexible, and constructive process (see Wood, 1989), which may be used in the service of boosting or, unwittingly, diminishing one's mood and self-esteem. This observation leads us to consider possible individual differences that might help explain people's varied and variable responses to favorable and unfavorable social comparisons. Indeed, we are all familiar with individuals who seem *personally* defeated after listening to a friend's accomplishments or after witnessing their own team go down. Some people appear immune to others' triumphs or undoings, while others monitor such information carefully and conscientiously, exerting effort to bolster their well-being and self-esteem by actively pursuing favorable ways to compare themselves with others. The present research seeks to capture such anecdotal observations experimentally by comparing individuals who differ in their chronic levels of affect and well-being — namely, dispositionally 'happy' and 'unhappy' people. Anecdotal and survey evidence alike suggest that happiness is one of the most salient and significant dimensions of human experience and emotional life (Diener, Suh, Lucas, & Smith, 1999), and it is critical to understand the cognitive processes that might serve to maintain or enhance it.

Previous studies have explored the general hypothesis that individual differences in happiness or well-being are linked to affective and cognitive responses to hedonically relevant information, including social comparison information. For example, happy individuals think relatively more positively about themselves (Campbell, 1981) and others (Matlin & Gawron, 1979), feel more personal control (Larson, 1989), and recall more positive events from their past (Seidlitz & Diener, 1993; Seidlitz, Wyer, & Diener, 1997). Happy people also have been found to react more positively and intensely to favorable life outcomes and positive events, to show shorter drops in affect in response to negative life events, and to interpret remembered life experiences more positively, than have unhappy people (Lyubomirsky & Tucker, 1998; Seidlitz & Diener, 1993; Seidlitz *et al.*, 1997). In addition, happy and unhappy people appear to show different responses — and in a manner supportive of their 'affective dispositions' — to both trivial and ego-threatening choices that they have made or been denied (Lyubomirsky & Ross, 1999). In sum, happy individuals respond in ways that seem to maintain and even promote their happiness and positive self-views, while unhappy individuals respond in ways that seem to support their unhappiness and negative self-views (see Lyubomirsky, 2001, for a review). Thus, one might expect happy and unhappy people to differ in how they distort or manipulate social comparison information, how they use such information, and how they respond to it.

These possibilities were investigated in two studies from our laboratory (Lyubomirsky & Ross, 1997). When solving anagrams alongside a noticeably 'faster' peer (but not alongside a much slower one), unhappy participants expressed greater doubts about their own abilities, showed decreased positive moods, and reported liking the experiment less than did happy participants (Study 1). A second study, which used a false feedback paradigm with a novel puppet teaching task, replicated and extended these findings. Remarkably, unhappy students reported more positive moods and greater self-confidence after receiving a poor evaluation (but hearing a peer receive an even worse one) than after receiving an excellent evaluation (but hearing a peer receive an even better one). Happy students, by contrast, did not show this pattern of 'sensitive' responding to passive peer comparisons.

Suggestive evidence regarding individual differences in the social comparison process is also available from research focusing on other dimensions of personality seemingly related to chronic

happiness (see Lyubomirsky & Lepper, 'what are the differences between happiness and self-esteem?' under review, 2000; Furr & Funder, 1998) (although, in most of these studies, participants did not actually witness another person's outcome or performance). For example, relative to people with high self-esteem (HSE), people with low self-esteem (LSE) tend to improve in mood after passively comparing with worse-off others (Aspinwall & Taylor, 1993; Gibbons & Gerrard, 1989) and respond more negatively after comparing with better-off others (Wheeler & Miyake, 1992; Buunk *et al.*, 1990). Furthermore, there is some evidence that HSE and LSE individuals use different strategies to cope with feedback (e.g. Mussweiler, Gabriel, & Bodenhausen, 2000; Wood *et al.*, 1994) and appear to rely on social comparison information to different degrees when evaluating themselves (e.g. Brickman & Berman, 1971; Wayment & Taylor, 1995). Other studies show that dysphoric individuals tend to be relatively more sensitive to passive social comparison information and/or respond more negatively to it (e.g. Gibbons, 1986; McFarland & Miller, 1994; Swallow & Kuiper, 1988; Weary, Elbin, & Hill, 1987). Lastly, those who are high on neuroticism have been found to report relatively more negative affective consequences after passively comparing with both better-off and worse-off others, and to show a relatively higher need for social comparisons (Van der Zee, Buunk, & Sanderman, 1996; Van der Zee, Oldersma, Buunk, & Bos, 1998).

THE PRESENT STUDIES

Two primary hypotheses guided our research—the first concerning differences between happy and unhappy people in response to 'undiluted', hedonically consistent social comparison feedback and the second concerning group differences in response to mixed, hedonically inconsistent feedback. First, based on previous research (Lyubomirsky & Ross, 1997; see also Ahrens, 1991; Buunk *et al.*, 1990; Gibbons & Buunk, 1999; Swallow & Kuiper, 1988; Van der Zee *et al.*, 1996, 1998; Weary *et al.*, 1987), unhappy people were hypothesized to be more reactive to passive social comparison information—particularly unfavorable information—than happy ones. This sensitivity is an instance of their broader sensitivity to all information carrying hedonic implications, especially negative ones (see Lyubomirsky, 2001, for a review). Unhappy individuals may have less firm convictions about their competence or abilities than happy ones, and thus have relatively more uncertainty to resolve through social comparison (e.g. Campbell, 1990; Kernis, Cornell, Sun, Berry, & Harlow, 1993; Weary *et al.*, 1987).

To allow for conceptual replication of previous work, the social comparison information presented to participants in our two studies included relative group feedback—namely, the news that their 'team' has either won or lost. Group comparisons are nearly as ubiquitous in everyday life as individual ones, and feedback about the status or position of one's group or social category carries significant hedonic stakes (see Brewer & Brown, 1998, for a review). Thus, our first hypothesis was expected to hold for social comparison information regarding both group and individual standing. The hedonic consequences of social comparison information regarding the standing of one's group have been examined in several related literatures, including research on social identity, self-categorization, relative deprivation, and performance feedback (e.g. Blanton, Crocker, & Miller, 2000; Brewer & Weber, 1994; Cialdini & Richardson, 1980; Major, Sciacchitano, & Crocker, 1993; O'Leary-Kelly, 1998; Seta & Seta, 1996; Tesser, 1988).

In addition, we sought to address the previously unanswered question of how happy and unhappy people might balance favorable and unfavorable social comparisons simultaneously—specifically, how our participants would respond to the news that their team has lost, but that they *personally* placed first; or, alternatively, that their team has won, but that they personally placed last. Hence, in both

Studies 1 and 2, we had the opportunity to test to what extent happy and unhappy students would be influenced by social comparison information about their personal performance *in the context of* feedback about their group's performance. Based on previous work (e.g. Ahrens, 1991; Aspinwall & Taylor, 1993; Lyubomirsky & Ross, 1997; McFarland & Miller, 1994), our second hypothesis was that, after receiving feedback about whether their group won or lost, the moods and self-assessments of unhappy students would be bolstered by additional favorable social comparison information about their personal performance (i.e. they ranked first) and deflated by additional unfavorable information (i.e. they ranked last). Happy students, by contrast, were not predicted to show this sensitive pattern of responding. As an illustration, we expected that unhappy individuals confronted with threatening information (i.e. their team's defeat) may be especially likely to seek to improve their moods and to feel better about themselves—that is, to try to use social comparisons in the service of self-enhancement (cf. Gibbons & Gerrard, 1991; Wills, 1991; Wood & Lockwood, 1999). Accordingly, because unhappy people are particularly sensitive to the negative implications of social comparison, we predicted that, in the face of hedonically conflicting feedback, they would try to use favorable social comparisons to buffer the effects of unfavorable ones or to reassure themselves (cf. Aspinwall & Taylor, 1993; Gibbons & Gerrard, 1989; Wood & Lockwood, 1999).

Procedures of Our Studies

In both of our studies, students working in teams of four performed in real time a verbal task in a relay-type competition against one other team and then received bogus feedback regarding team success (i.e. victory vs. defeat). In Study 1, half the participants additionally received information about their individual standing (i.e. 'first' or 'last' on team), which always happened to be hedonically inconsistent with their team feedback. Thus, the intergroup versus intragroup factor (i.e. team versus individual feedback) and the nature of the conflicting information (i.e. favorable versus unfavorable) were confounded in this study. In Study 2, which used a fully crossed design, all participants received information regarding their individual ranks, which was either hedonically consistent *or* inconsistent with the team feedback.

The tasks that we chose for our two studies—'word-generation' and 'analogical reasoning', respectively—were designed to tap evaluation dimensions that differed somewhat in familiarity and importance to our participants and thus permitted conceptual replication. In both studies, we sought to create a situation that allowed students to construct their own meaning and to 'manage' or manipulate the social comparison process as they wished—for example, to gauge how important, self-relevant, or controllable the task was to them and to draw whatever types of attributional inferences from their own and their peers' performances that they wished.

STUDY 1

Method

Overview

Self-rated happy and unhappy undergraduates participated in two teams of four, which competed against one another on their performance on a word-generation task. After the competition, participants were told that their team had either won or lost. Half of the students were further given

information regarding their *individual* standing — that is, half of those that had been on a ‘winning’ team additionally learned that they placed last (out of four) and half of those that had been on a ‘losing’ team additionally learned that they placed first (out of four). All students reported on their levels of positive and negative affect before and after completing the competition and receiving feedback, and provided self-assessments of current and future personal performance at the end of the study.

Participants

Students enrolled in Introductory Psychology at a state university ($N=109$) received credit for their participation in this study. Participants were selected based on their responses to the Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999), which was mass-administered earlier in the quarter. The first item on the scale asked students to characterize themselves using absolute ratings (1 = *not a very happy person*, 7 = *a very happy person*), while the second item asked students to characterize themselves relative to their peers (1 = *less happy*, 7 = *more happy*). The third and fourth items, respectively, characterized happy people (i.e. ‘Some people are generally very happy; they enjoy life regardless of what is going on, getting the most out of everything’) and unhappy people (i.e. ‘Some people are generally not very happy; although they are not depressed, they never seem as happy as they might be’), and asked participants to what extent each characterization described them (1 = *not at all*, 7 = *a great deal*). Two items were purposefully created as relatively general and two items as relatively specific, allowing respondents to define happiness for themselves. Furthermore, the second item, which appears to tap a comparative process, correlated highly with the other three items (Pearson’s r ’s ranging from 0.79 to 0.81). Responses to the four items were combined and averaged to provide a single SHS composite score, ranging from 1.0 to 7.0. The composite showed good internal consistency (Cronbach’s $\alpha=0.80$), suggesting that the SHS is not multi-dimensional.¹

Participants’ scores on the Beck Depression Inventory (BDI; Beck, 1967) had also been collected from the same mass-administered questionnaire and students with scores of 16 and above (i.e. those classified as dysphoric) were excluded from selection in this study. The correlation between participants’ BDI and SHS scores was relatively modest ($r=-0.31$).

A sample of 52 ‘happy’ and 57 ‘unhappy’ students (i.e. those whose composite scores on the SHS were, respectively, either in the top or bottom quartile of the distribution) (cut-offs were 5.75 and 4.25 on the 7-point scale, respectively) were recruited for the study by telephone. The happy students’ group mean on the relevant scale was 6.06 ($SD=0.37$), whereas the unhappy students’ group mean was 3.78 ($SD=0.55$).

Design

The design was a 2(happy versus unhappy) \times 2(team win versus team lose) \times 2(individual feedback given versus no individual feedback given) factorial. The individual feedback comprised information regarding participants’ rank placement on their team; however, those who received individual feedback were always told that they either placed first (if their team had ‘lost’) or that they placed

¹This composite measure of global subjective happiness has been found to have good to excellent validity and reliability in 14 studies with a total of 2732 participants. Data has been collected in the United States from students on two college campuses and one high school campus, from community adults in two California cities, and from older adults. Students and community adults in Moscow, Russia also participated in the research to assess the scale’s reliability and construct validity. For further information, see Lyubomirsky and Lepper (1999).

fourth (if their team had 'won'). The two conditions of individual feedback were alternated between experimental sessions. Two happy and two unhappy participants were scheduled for each team.

Procedure and Materials

Two female experimenters ran each experimental session. Eight students—four per team—participated together. Upon arrival to the laboratory, participants were directed to pre-assigned seats, which were arranged in two parallel columns of four. The study was introduced as an examination of the relationship between 'cognitive style' and 'verbal abstraction acuity'—specifically, how people with similar cognitive styles perform as a team relative to another team composed of people with different cognitive styles, on a 'word-generation' task. Participants were told that, based on their responses to an earlier, mass-administered questionnaire, they had been previously assigned to either group A or group B. Next, participants were handed a badge indicating their team (A or B) and player number (1, 2, 3, or 4), which they were instructed to attach to their shirts. The experimenters explained that the number on their tags was arbitrary, and only referred to the order that they would be performing during the competition. At this time, participants read and signed consent forms.

Preliminary Questionnaire. Before beginning the competition, participants completed a preliminary questionnaire. This questionnaire was designed to bolster our 'cover story' and included questions about how much students enjoy solving puzzles and how often they play competitive board games. In addition to these filler measures, the Positive Affect Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), with 10 items measuring positive affect (PA) and 10 items measuring negative affect (NA) (reverse scored) on 5-point Likert scales, was administered. Because we were interested in participants' general affective reactions to performance feedback, these 20 items were combined to provide a single index of affect on which more positive scores reflected more positive mood. Furthermore, we were encouraged by the very good internal consistency of this combined measure (Cronbach's $\alpha = 0.80$; see also below).

Word-generation Task. After completing the preliminary questionnaire, the participants were given an opportunity to practice the word-generation task. This task required 'players' to write down words beginning with 'in_' that corresponded to a given definition. For example, the correct response to the definition 'a very young child; baby' is 'infant'.

After the practice session, the competition was described to participants as a relay-type competition, in which each member, one at a time, would have 1 min to work on the word-generation task, presented on a single sheet of paper, and that the object was to try to complete as many of the items on the sheet of paper as one could within the allotted time. Participants were told that final team scores would be computed based on the average number of correct answers from each team member, combined with the number of *unique* items that the team completed. This scoring protocol was devised so that participants could not easily determine which team actually won. Next, students were told that when the experimenter said 'ready', team member #1 from each team was to walk up to the front of the room, and, after the experimenter said 'go', would have 1 min to privately complete the task. When 1 min was up, the experimenter would say 'stop', at which time player #1 would return to his or her seat. The experimenters explained that this process would be repeated for the second, third, and fourth members on each team. At this time, participants were invited to ask questions about the procedure.

Announcement of the Winning Team. After the competition, the second experimenter was ostensibly given time 'to finish scoring' participants' answers. (Only the number of items correct was actually

scored.) The two experimenters then announced the winning team with excitement and clapping. The study was designed so that Team B always ostensibly won with an 'aggregated' score of 21.75, and Team A always lost with a score of 14.22.

Individual Feedback and Post-competition Questionnaire. When their name was called by the experimenter, each participant was next instructed to walk to the front of the room to receive a questionnaire. Along with the questionnaire, participants were handed feedback forms, which included their player number and the actual number of correct items that they had completed on the word-generation task. In addition to this information, during half of the sessions (the *individual feedback* conditions), participants received individual feedback regarding their rank placement within their team. This rank placement was either first or fourth, but was always circled '4th' for participants on the winning team (Team B) and always circled '1st' for participants on the losing team (Team A).

In the post-competition questionnaire, students again completed the PANAS (Cronbach's $\alpha = 0.87$) and rated how well they thought they did on the word-generation task and how well they thought they would do if they were to perform the same task in the future (1 = *very poor*, 7 = *excellent*). As manipulation checks, participants were asked to mark what team they had been on (i.e. A or B), whether their team had won or lost, their assigned player number (i.e. 1, 2, 3 or 4) and, in the relevant conditions, their rank placement.

The end of the post-competition questionnaire, as well as the oral debriefing, included questions attempting to check whether our procedures were successful at minimizing suspicions. For example, participants were asked why they were selected and assigned to a particular group, what were the main hypotheses, and whether they were suspicious of anything in the study. None guessed the hypotheses of the study or reported any significant suspicions. At the end of the experiment, which lasted approximately one hr, students were thoroughly debriefed in order to minimize any long-term impact of the false feedback manipulation (see Ross, Lepper, & Hubbard, 1975).

Results and Discussion

Preliminary analyses revealed no main effects or interactions with sex of participant; accordingly, subsequent analyses and presentation of results were collapsed across sex.

Manipulation Checks

Students correctly completed a mean of 5.13 words (out of 25) ($SD = 2.08$) during the 1-min time period allotted. Happy and unhappy students did not significantly differ in the number of correctly completed items on the word-generation task (M 's = 5.33 versus 4.95) ($F < 1$, *ns*). Importantly, at the end of the experiment, all students correctly stated their team label, player number, and team status (i.e. 'won' versus 'lost'), and, in the relevant conditions, all correctly reported the individual feedback that they received (i.e. whether they came in '1st' or '4th'). These findings bolster our confidence in the effectiveness of our manipulations of ostensible team status and individual performance within the individual feedback conditions.

Summary of Predictions and Primary Statistical Analyses

Our first hypothesis concerned participants' responses to 'undiluted' social comparison information. Unhappy students were predicted to be influenced to a greater extent than happy ones by unfavorable

comparisons — that is, those made with others' superior performances. Specifically, we expected unhappy students to report smaller increases (or larger decreases) in overall positive affect and lower self-assessments to the news of team 'defeat' than happy students. By contrast, no group differences were expected after news of a team 'victory'.

Our second hypothesis concerned responses to 'hedonically inconsistent' information — that is, simultaneous favorable and unfavorable comparisons. The news that they placed first on a losing team was expected to bolster unhappy students' positive affect and self-evaluations, and the news that they placed last on a winning team was expected to dampen them. By contrast, happy students' self-evaluations and mood changes were not expected to differ in conditions where they learned that their team had lost (or won) and where they *additionally* learned that they personally placed first (or fourth). As suggested by Rosenthal and Rosnow (1985; Rosnow & Rosenthal, 1989, 1995), these two hypotheses were tested with planned pairwise comparisons.

*Changes in Affect*²

Supporting previous research (e.g. Lyubomirsky & Ross, 1997, 1999), happy students reported significantly higher overall positive affect than did unhappy ones both before they began the study, $t(101) = 5.96$, $p < 0.0001$, $r = 0.51$,³ and immediately after the competition, $F(1, 101) = 30.58$, $p < 0.0001$, $\eta^2 = 0.48$. Hence, all analyses were conducted on scores reflecting changes in overall positive affect from pre to post competition (see top of Table 1).⁴

Table 1. Mean responses (SDs) of the eight groups to social comparison feedback (Study 1)

Rating	Group			
	Team win		Team lose	
	No ind. fdbk	4th place	No ind. fdbk	1st place
Changes in affect				
Happy	+0.09 (0.25)	+0.09 (0.55)	-0.01 (0.49)	-0.08 (0.30)
Unhappy	+0.12 (0.29)	-0.12 (0.40)	-0.30 (0.44)	+0.01 (0.39)
Self-assessments of current performance				
Happy	4.46 (1.05)	3.39 (1.71)	3.39 (1.35)	3.50 (1.95)
Unhappy	3.29 (1.79)	2.36 (1.08)	1.79 (0.80)	3.67 (1.84)
Self-assessments of future performance				
Happy	5.38 (0.87)	5.15 (1.28)	5.46 (1.37)	5.14 (1.29)
Unhappy	4.46 (1.61)	4.43 (1.45)	3.86 (0.86)	4.87 (0.99)

²The pattern of results was virtually identical when changes in affect were analyzed using separate indices of PA and NA.

³Analyses of covariance were also performed in both studies to test whether these baseline differences between happy and unhappy students may have moderated the significant between-group differences reported in our paper (cf. Seidlitz & Diener, 1993). For example, to test whether our results were moderated by differences in transient mood, rather than self-assessments of happiness, a second set of analyses was performed using the students' baseline mood as a covariate. Rather than taxing our readings unnecessarily, we merely note here that all such covariance analyses yielded results virtually identical to those obtained when mood was not included as a covariate. That is, all significant effects remained significant, and all nonsignificant effects remained non-significant.

⁴Other types of statistical analyses — namely, covariance and repeated measures analyses — were also performed. The results of these analyses were very similar to those reported in our paper, and, accordingly, in the interest of clarity and brevity, are not discussed any further.

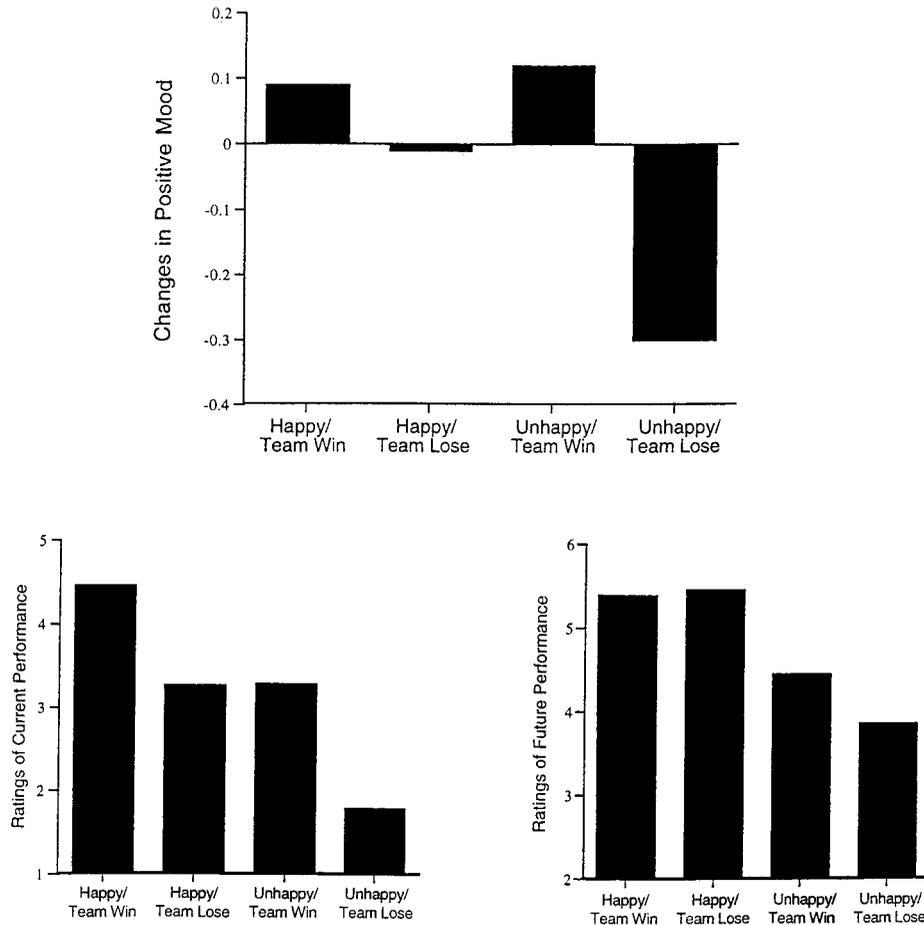


Figure 1. Changes in overall positive affect (top panel), self-assessments of current performance (bottom-left panel), and self-assessments of future performance (bottom-right panel) in response to feedback regarding the performance of one's group (Study 1)

Responses to Undiluted Social Comparison Feedback. Supporting our first hypothesis, among those who did not receive individual feedback, unhappy students who learned that their team had lost showed larger decreases in overall positive affect than did happy students in the same condition (Δ 's = -0.30 versus -0.01), $F(1, 105) = 4.00$, $p < 0.05$, $\eta^2 = 0.19$; however, no differences between unhappy and happy students on changes in overall affect were observed after their team had won ($F < 1$, ns) (see top of Table 1 and top panel of Figure 1). Stated differently, unhappy participants were significantly more negatively affected in their emotional reactions by losing than by winning, whereas the responses of happy participants failed to discriminate between group failure and group success.

Responses to Hedonically Mixed Social Comparison Feedback. Supporting our second hypothesis, when *individual* feedback (i.e. the news that they personally had placed first) was provided along with feedback that their team had lost, unhappy students were affectively bolstered by this information (see the top panel of Figure 2 and top of Table 1). That is, planned comparisons revealed that

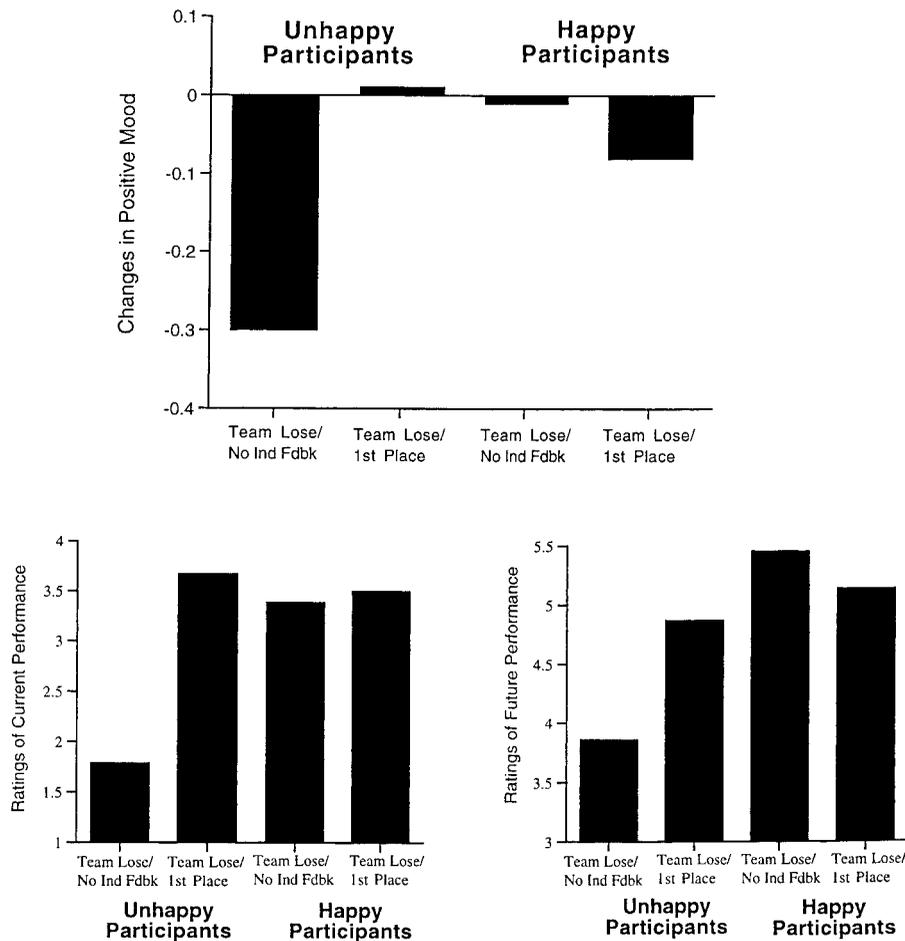


Figure 2. Changes in overall positive affect (top panel), self-assessments of current performance (bottom-left panel), and self-assessments of future performance (bottom-right panel) in response to feedback regarding group and individual performance (Study 1)

unhappy participants whose teams had lost (but they learned that they personally placed first) ($\Delta = +0.01$) showed significantly smaller decreases in overall affect than unhappy participants whose teams had lost (and they received no individual feedback) ($\Delta = -0.30$), $F(1, 105) = 4.00$, $p < 0.05$, $\eta^2 = 0.19$. Importantly, however, no such difference was observed for happy students ($F < 2.25$, *ns*).

However, although we found the predicted pattern of results in conditions involving team victory, the relevant analyses failed to reach statistical significance.

Self-assessments of Current Performance

Supporting previous research, overall, happy individuals gave more positive self-assessments of their own performance on the word-generation task than did unhappy individuals (M 's = 3.66 versus 2.78), $F(1, 98) = 8.96$, $p < 0.004$, $\eta^2 = 0.29$.

Responses to Undiluted Social Comparison Feedback. Paralleling the results for affective responses (though less strong), significant differences between happy and unhappy participants who did *not* receive individual feedback were observed following the feedback that their team had lost (M 's = 3.27 versus 1.79), $F(1, 104) = 6.60$, $p < 0.02$, $\eta^2 = 0.24$, but not following the feedback that their team had won (M 's = 4.46 versus 3.29) ($F < 3.5$, *ns*) (see bottom-left panel of Figure 1 and middle of Table 1). In other words, unhappy students rated their own performance differently as a function of whether their team had lost or won; happy students' self-assessments, by contrast, were not similarly sensitive to the effects of team status.

Responses to Hedonically Mixed Social Comparison Feedback. Mirroring the results for affect changes, unhappy students whose teams had lost (but they placed first) felt they did better on the task ($M = 3.67$) than did unhappy students who solely learned that their team had lost ($M = 1.79$), $F(1, 104) = 9.86$, $p < 0.003$, $\eta^2 = 0.29$ (see bottom-left panel of Figure 2 and middle of Table 1). Notably, happy students did not show this pattern of responding ($F < 1$, *ns*). Again, however, failing to support our second hypothesis, the expected pattern of results was not observed in conditions involving news of a team win.

Self-assessments of Future Performance

Overall, happy students predicted better personal *future* performance on the word-generation task than unhappy ones (M s = 5.28 versus 4.40), $F(1, 99) = 13.47$, $p < 0.0001$, $\eta^2 = 0.35$.

Responses to Undiluted Social Comparison Feedback. Once again, supporting our first hypothesis, after learning the news that their team had lost, unhappy students predicted that they would perform less well in the future than did happy ones (M 's = 3.85 versus 5.46), $F(1, 105) = 10.82$, $p < 0.002$, $\eta^2 = 0.31$. However, no such group difference was found following group success ($F < 3.2$, *ns*) (see bottom of Table 1 and bottom-right panel of Figure 1). This pattern of results, displayed in Figure 1 for all three of our dependent variables, points to the intriguing observation that unhappy students' moods and self-assessments, unlike those of happy ones, may be negatively affected by team defeat but not positively affected by team victory — that is, that unhappy participants' sensitivity to group social comparisons led them to suffer more in the face of team defeat than to bask in the face of team victory.⁵

Responses to Hedonically Mixed Social Comparison Feedback. When given the additional information that they placed first (when their team had lost), unhappy students predicted that they would perform better in the future ($M = 4.87$) than when they only knew that their team had lost ($M = 3.86$), $F(1, 105) = 4.20$, $p < 0.05$, $\eta^2 = 0.20$ (see bottom-right panel of Figure 2 and bottom of Table 1). Supporting our second hypothesis and mirroring the data for our other variables, this pattern of results was not found for happy students ($F < 1$, *ns*). These findings for assessments of future performance, as well as for our other two primary dependent variables, suggest that unhappy students appear to use the favorable social comparison information (i.e. individual first place) to 'buffer' the news that their team has lost. As shown in the three panels of Figure 2, this pattern of results is even more striking given the finding that even unhappy individuals who were so 'buffered' still showed self-assessments and affect changes that were no higher than those of happy individuals who were not.

⁵The results of exploratory analyses confirmed this suggestion for all our primary dependent variables in Study 1. That is, unhappy participants who solely learned that their team had lost showed significantly larger drops in affect and significantly lower self-assessments of current and future performance than did the three other groups who similarly did not receive individual feedback.

Finally, as before, no significant differences were found for either group in the two 'team win' conditions. Thus, overall, the prediction that unhappy individuals' responses would be depressed by news of their low rank (albeit on a victorious team) received weak support, if any. That is, the expected pattern of results was only marginally significant for affect changes and non-significant for assessments of current and future performance. Further research may be needed to replicate these findings and to test the possibility that they were produced by the nature of the competitive task used in this study — i.e. one carrying relatively trivial implications.

STUDY 2

Study 2 was designed to address several interesting questions raised by our first study. First, we elected to assess a couple of underlying variables that may play a role in the differences in sensitivity to social comparison information found between happy and unhappy participants. We hypothesized that happy individuals may be relatively less likely to readjust their feelings concerning their personal contribution to the team outcome and less inclined to hold themselves responsible for a poor performance. Second, to permit conclusions regarding group differences in post-manipulation *changes*, the key dependent variables were assessed before and after the competition. Third, unlike Study 1, a 'complete' fully-crossed design was used in Study 2, such that all participants received feedback regarding both team status (won versus lost) and individual rank (1st versus 4th).⁶ Consequently, Study 2 included two new 'double whammy' conditions — one positive (team victory plus personal success) and one negative (team defeat plus personal failure). Following our first hypothesis and our findings from Study 1 — namely, that unhappy individuals are more reactive to unfavorable social comparisons than happy ones — we predicted that group differences would be most pronounced in the double negative feedback condition and least pronounced in the double positive feedback one. Finally, following our second hypothesis, we predicted that unhappy individuals would be more reactive to relative individual feedback in the context of relative *group* feedback.

Method

Overview

Happy and unhappy students took part in a relay-type competition in which two teams of four performed an analogical reasoning task under time pressure. Immediately after the competition, participants learned that their team had either won or lost and, further, that they had either placed first or last on their team. Before and after the competition, all students reported on their levels of affect and their self-assessments of ability at the task, and provided estimates of their personal contribution to their team's performance. Finally, independent judges later coded the attributional style of students' end-of-study explanations for their personal performance.

Participants

Introductory Psychology students ($N = 122$) participated in this study in exchange for course credit. As in Study 1, participants were selected based on their responses to the SHS ($\alpha = 0.81$) at the beginning

⁶We thank Joanne Wood for suggesting this design.

of the quarter. Those whose scores on the happiness scale were in the upper and lower quartile of the distribution were recruited for the happy group ($n = 62$, $M = 6.17$, $SD = 0.44$) and unhappy group ($n = 60$, $M = 3.95$, $SD = 0.62$), respectively. As in Study 1, students with BDI scores 16 and above were excluded.

Design

Unlike Study 1, the design was a fully crossed 2(happy versus unhappy) \times 2(team win versus team lose) \times 2(first place versus fourth place) factorial. The procedure for assigning the conditions was similar to that of Study 1, except that in *all* sessions, half the members of each team learned that they placed first and half learned that they placed fourth.

Procedure and Materials

The procedures of this study were identical to those employed in Study 1, with the following exceptions: (1) a new competitive task — analogical reasoning — was used; (2) additional self-report measures were added before and after the manipulation; and (3) two independent judges later coded the attributional style of participants' open-ended responses.

Preliminary Questionnaire. As in Study 1, participants first completed a preliminary questionnaire, which included the same filler questions, as well as the PANAS (Watson *et al.*, 1988). The 20 items on the PANAS were again combined to provide a single index of affect on which more positive scores reflected more positive mood ($\alpha = 0.84$).

Analogical Reasoning Task. Next, participants were given an opportunity to practice several examples of items on the analogical reasoning ('analogies') task. This task required players to select a pair of words or phrases (out of five) that best expressed a relationship similar to that expressed in a target pair.

After practicing the analogies task, participants rated how good they thought they were at this task (1 = *very poor*, 7 = *excellent*) and estimated what percent of their team's ultimate performance will be due to their contribution (from 0% to 100%). After completing these questions, students listened to a description of the competition, which was identical to that of Study 1 except for a change in the individual time limit given (2 min versus 1 min).

Announcement of the Winning Team. With the exception of the value of the team scores, the same procedure was used as in Study 1 to announce the winning team. Team B always 'won' with a score of 14.25, and Team A always 'lost' with a score of 9.75.

Individual Feedback and Post-competition Questionnaire. Once again, the procedure was similar to that of Study 1, with the following exceptions. Most important, all students received individual feedback (i.e. rank placement information). Second, in order to assess *changes* in participants' moods and self-assessments from before to after the competition, all students once again completed the PANAS ($\alpha = 0.85$), as well as two previous assessments — how good they thought they were at the analogies task (1 = *very poor*, 7 = *excellent*) and what percent of their team's ultimate performance was due to their contribution (from 0% to 100%).

Finally, students answered an open-ended question regarding what they thought were the most important contributing factors to their personal performance. Responses to this question purposefully

called for causal explanations for their presumably excellent (when first) or poor (when last) performance. These explanations were coded by two raters on the basis of three dimensions described by Abramson and colleagues (1978): (1) how stable is the cause across time (1 = *cause is transient*, 7 = *cause persists*), (2) how global is the cause across domains (1 = *cause is limited in its effects*, 7 = *cause affects many domains and outcomes*), and (3) how internal to the person is the cause (1 = *cause implicates something characteristic about the situation*, 7 = *cause implicates something characteristic about the person*) (see Lyubomirsky & Nolen-Hoeksema, 1995, for similar procedures). All responses contained codable attributions. An overall index of attributional style was calculated from the mean of the three ratings of students' explanations — namely, stability, globality, and internality. Inter-rater agreement was adequate — the intra-class correlations were 0.78 for stability, 0.68 for globality, and 0.74 for internality.

Results and Discussion

Because there were no main effects or interactions with sex of participant, subsequent analyses were collapsed across this variable. Furthermore, following a practice session with the analogies task, no group differences were found in students' baseline self-assessments of task ability and estimates of their contribution to the team's performance.

Manipulation Checks

Students correctly completed a mean of 5.42 analogies (out of 20) ($SD = 2.32$) during the 2-min time period allotted. Importantly, again, happy and unhappy students did not significantly differ in the number of correctly completed items on the analogical reasoning task (M 's = 5.45 versus 5.38) ($F < 1$, ns), and, at the end of the experiment, all students correctly stated their team label, player number, and team status, as well as the valence of their individual feedback.

Summary of Predictions and Primary Statistical Analyses

Following our first hypothesis, differences between happy and unhappy participants were expected following 'undiluted', hedonically consistent unfavorable feedback — i.e. in the negative 'double-whammy' condition — but not in the analogous positive one. Following our second hypothesis, group differences were predicted in response to additional favorable and unfavorable feedback about *personal* performance in the context of information about one's *group's* performance. Finally, exploratory analyses were conducted regarding group differences in our two hypothesized underlying variables. As in Study 1, our hypotheses were tested with pairwise comparisons (Rosenthal & Rosnow, 1985; Rosnow & Rosenthal, 1989, 1995).

Changes in Affect

As in Study 1, overall, happy participants reported significantly more positive affect than unhappy ones both at the beginning of the study, $t(119) = 6.71$, $p < 0.0001$, $r = 0.52$, and immediately after the competition, $F(1, 114) = 39.40$, $p < 0.0001$, $\eta^2 = 0.51$. Consequently, all analyses were conducted on scores reflecting affect changes. The two top panels of Figure 3, as well as the top of Table 2, display the means for changes in overall affect for all eight conditions.

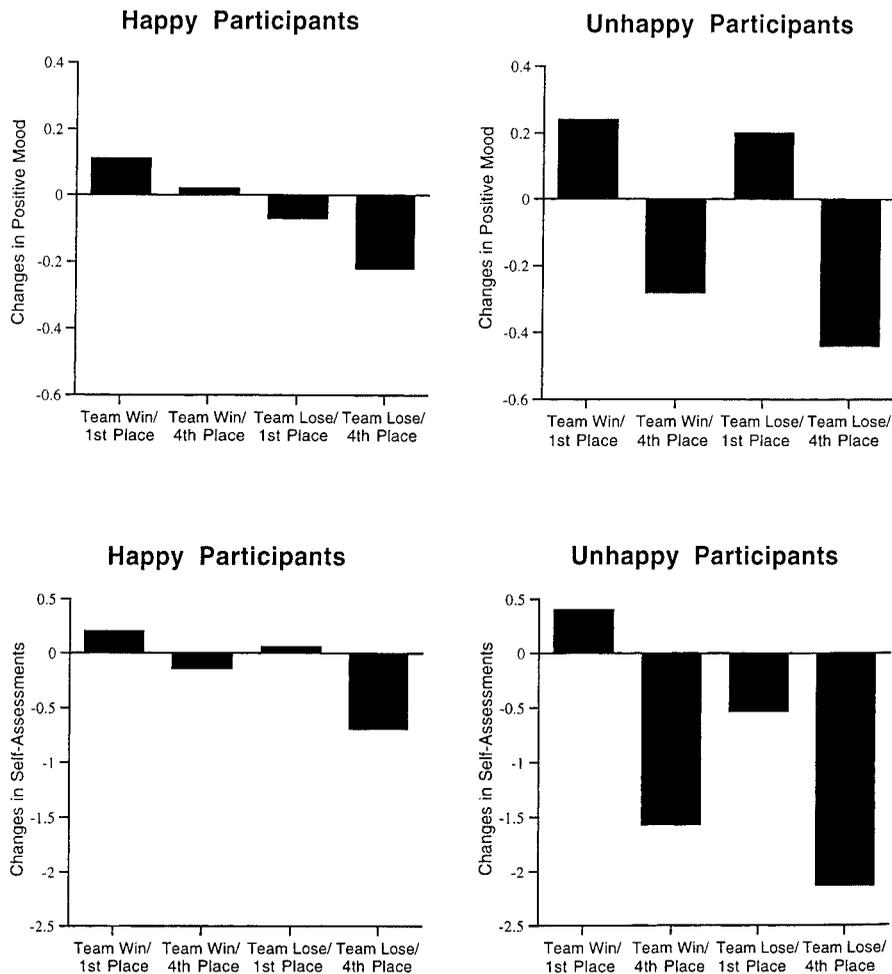


Figure 3. Changes in overall positive affect (top panels) and changes in self-assessments of ability (bottom panels) of happy and unhappy participants in response to feedback regarding group and individual performance (Study 2)

Responses to Hedonically Consistent Social Comparison Feedback. Supporting our first hypothesis and conceptually replicating the results of Study 1, group differences were observed in the situation involving the most 'unfavorable' feedback, but not in the most 'favorable' one. That is, differences in affect changes between unhappy and happy students were significant following the news that their team had lost *and* they placed last (Δ 's = -0.44 versus -0.22), $F(1, 114) = 5.34$, $p < 0.03$, $\eta^2 = 0.21$, but not following the news that their team had won *and* they placed first (Δ 's = $+0.24$ versus $+0.11$) ($F < 1$, *ns*).

Responses to Hedonically Mixed Social Comparison Feedback. Supporting our second hypothesis, notwithstanding team feedback, unhappy students displayed increases in affect upon news that they personally placed first and decreases in affect upon news that they personally placed last. Notably, the difference between these two individual feedback conditions for unhappy individuals was significant

Table 2. Mean changes in responses (SDs) of the eight groups to social comparison feedback (Study 2)

Rating	Group			
	Team win		Team lose	
	1st place	4th place	1st place	4th place
Changes in affect				
Happy	+0.11 (0.26)	+0.02 (0.29)	-0.07 (0.29)	-0.22 (0.24)
Unhappy	+0.24 (0.37)	-0.29 (0.46)	+0.20 (0.54)	-0.44 (0.30)
Changes in self-assessments				
Happy	+0.20 (1.86)	-0.14 (1.46)	+0.06 (1.39)	-0.69 (1.85)
Unhappy	+0.40 (1.50)	-1.57 (1.02)	-0.53 (1.36)	-2.13 (1.36)
Changes in % contribution				
Happy	+8.00 (15.56)	-6.43 (6.63)	+7.35 (26.93)	-8.75 (15.97)
Unhappy	+8.67 (16.63)	-13.46 (13.90)	+17.33 (18.79)	-17.81 (18.35)

regardless of whether their team happened to have won (Δ 's = +0.24 versus -0.28), $F(1, 114) = 15.75$, $p < 0.0001$, $\eta^2 = 0.35$, or lost (Δ 's = +0.20 versus -0.44), $F(1, 114) = 25.88$, $p < 0.0001$, $\eta^2 = 0.43$. By contrast, happy students did not show significantly different changes in mood in response to news of their rank placement (Δ 's = +0.11 versus +0.02 for team success; and Δ 's = -0.07 versus -0.22 for team failure) (both F 's < 1.5).

Changes in Self-assessments

Notably, this study allowed us to rectify problems with the interpretation of post-competition ratings in Study 1 by examining changes in our participants' self-assessments from pre- to post-competition. Not surprisingly, overall, happy students reported relatively smaller decreases in their assessments of ability at the analogical reasoning task (Δ 's = -0.14 versus -0.96), $F(1, 114) = 8.94$, $p < 0.003$, $\eta^2 = 0.27$. Our primary interest, however, was examining the specific pattern of results reflected in our eight conditions (see bottom panels of Figure 3 and middle of Table 2). The results of our analyses generally mirrored those for changes in affect.

Responses to Hedonically Consistent Social Comparison Feedback. Again, supporting our first hypothesis, the most striking difference between unhappy and happy students was observed in the condition carrying a 'double whammy' of team and individual failure (Δ 's = -2.13 versus -0.69), $F(1, 114) = 7.33$, $p < 0.008$, $\eta^2 = 0.25$, but no group difference was found in the 'reverse double whammy' of team and individual success (Δ 's = +0.40 versus +0.20) ($F < 1$, *ns*).

Responses to Hedonically Mixed Social Comparison Feedback. Supporting our second hypothesis, unhappy participants showed smaller decreases (or larger increases) in their self-assessments of ability after receiving news that they ranked first than after receiving news that they ranked fourth. This pattern of results was evident in conditions signifying team success (Δ 's = +0.40 versus -1.57), $F(1, 114) = 12.48$, $p < 0.0006$, $\eta^2 = 0.31$, and in conditions signifying team failure (Δ 's = -0.53 versus -2.13), $F(1, 114) = 8.70$, $p < 0.004$, $\eta^2 = 0.27$. Once again, by contrast, our happy participants showed similar changes in self-assessments in response to good versus bad news regarding their individual placement (Δ 's = +0.20 versus -0.14 for team victory; and Δ 's = +0.06 versus -0.69 for team defeat) (both F 's < 2).

Underlying Variables

Changes in Perceptions of Personal Contribution. Interestingly, the pattern of results for changes in participants' estimates of their own contribution to their team's ultimate performance partially paralleled that for our two primary dependent variables (see bottom of Table 2 and top panels of Figure 4). Although both happy and unhappy participants (logically) boosted their estimates more after having placed first than after having placed fourth, the differences for the unhappy group were greater than those for the happy one. This pattern of results was reflected in a significant interaction between group and individual rank, $F(1, 113) = 4.27, p < 0.05$.

Attributional Style. The bottom two panels of Figure 4 display mean ratings of attribution style for happy and unhappy participants. Consistent with our hypotheses, happy participants generated more

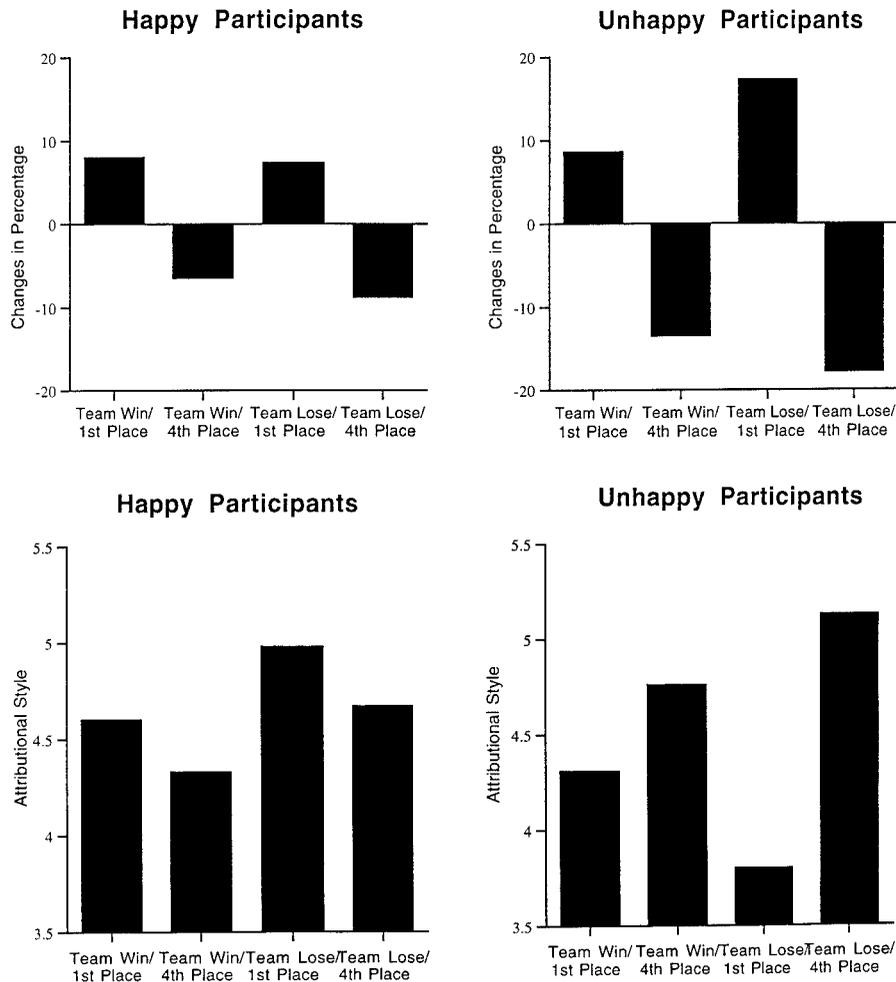


Figure 4. Changes in estimates of personal contribution to team performance (top panels) and attributional style (i.e. stable, global, and internal attributions) (bottom panels) of happy and unhappy participants in response to feedback regarding group and individual performance (Study 2)

Table 3. Mean codings (SDs) for attributional style of the eight groups (Study 2)

Rating	Group			
	Team win		Team lose	
	1st place	4th place	1st place	4th place
Attributional style				
Happy	4.60 (1.60)	4.33 (1.70)	4.98 (0.80)	4.47 (1.26)
Unhappy	4.31 (1.56)	4.76 (1.03)	3.80 (1.27)	5.13 (1.04)
Stability				
Happy	5.93 (1.98)	5.07 (2.43)	6.21 (1.48)	5.40 (2.06)
Unhappy	5.27 (2.31)	5.64 (1.86)	4.89 (2.52)	6.07 (1.67)
Globality				
Happy	2.07 (2.09)	1.79 (2.01)	2.29 (2.27)	1.87 (1.88)
Unhappy	1.53 (1.55)	1.91 (1.81)	1.10 (0.32)	2.33 (2.26)
Internality				
Happy	6.50 (1.60)	6.14 (2.18)	6.43 (1.60)	6.13 (2.10)
Unhappy	6.13 (2.10)	6.73 (0.90)	5.50 (2.55)	7.00 (0.00)

stable, global, and internal explanations for their performance when they placed first than when they placed last (e.g. crediting their verbal skills when they performed well, but not reproaching their lack thereof when they fared poorly), whereas unhappy participants showed the *reverse* pattern. The effect was reflected in a significant interaction between group and individual rank for the attribution index, $F(1, 101) = 6.15$, $p < 0.02$, $\eta^2 = 0.24$, as well as for ratings of stability, $F(1, 99) = 4.01$, $p < 0.05$, $\eta^2 = 0.20$, and internality, $F(1, 100) = 3.91$, $p = 0.05$, $\eta^2 = 0.19$. Codings of globality showed the same pattern of results, but failed to reach statistical significance, $F(1, 101) = 2.43$, $p < 0.13$, $\eta^2 = 0.15$, possibly because these codings reflected relatively low levels of interrater agreement. The cell means and standard deviations for the three attributional dimensions, as well as the overall index, are presented in Table 3.

GENERAL DISCUSSION

The findings from our two studies lend support to our two primary hypotheses. Following our first hypothesis, when exposed to hedonically consistent feedback, unhappy students proved to be more sensitive than happy ones to unfavorable social comparison information regarding group standing (Study 1), as well as a combination of group and individual standing (Study 2). In Study 1, differences between dispositionally happy and unhappy students were greatest following unfavorable group comparisons — that is, unhappy participants responded more negatively to the news of team ‘failure’ than did happy participants. Specifically, after learning that their team had lost, unhappy students reported that they *personally* performed less well, predicted that they would perform less well in the future on a similar task, and showed greater decreases in positive affect than did happy students. These group differences, by contrast, were not generally observed in the conditions that announced group success. Study 2 conceptually replicated these results. Between-group differences were observed in situations carrying unfavorable social comparison information (i.e. the double-whammy of team defeat and personal failure), but not at all in situations carrying favorable information (i.e. the double-whammy of team victory and personal triumph). These results extend the generalizability of our

earlier work (Lyubomirsky & Ross, 1997) by examining the hedonic consequences of social comparison information regarding the standing of one's group.

Supporting earlier research (Lyubomirsky & Ross, 1997, 1999; Lyubomirsky & Tucker, 1998; Seidlitz & Diener, 1993; Seidlitz *et al.*, 1997), these findings support the notion that unhappy people are more inclined than happy ones to rely on passive social comparisons — at both the group and individual level — for the purpose of evaluating themselves, perhaps because their self-concepts are less stable, clear, and certain (cf. Campbell, 1990; Kernis *et al.*, 1993; Weary *et al.*, 1987; cf. Wood & Lockwood, 1999). The consequent hyper-sensitivity to social comparisons, when combined with negatively-biased judgments (e.g. Lyubomirsky & Ross, 1999; Lyubomirsky & Tucker, 1998; Seidlitz *et al.*, 1997), is likely to lead unhappy individuals to interpret unfavorable social comparison information particularly pessimistically or to focus on its negative aspects (for related findings, see Ahrens, 1991; McFarland & Miller, 1994).

Furthermore, unhappy students' sensitivity to social comparison information regarding group standing (in Study 1) and, to some extent, a combination of group and individual standing (in Study 2) appears to 'hurt' them when it is unfavorable (deflating their moods and self-assessments), but does not seem to 'help' them when it is favorable (not materially augmenting their moods and self-assessments). (Although, lacking the appropriate control group, we can be confident in this interpretation of our findings with respect to changes in mood and self-assessments only.) This pattern of results leads us to speculate that unhappy people may hold themselves culpable for their team's losses, but fail to commend themselves for their team's victories — a conjecture supported by Study 2. For example, because unhappy folks rated their *own* performance significantly lower when their team had lost than when their team had won, they may have felt responsible for the loss to no small degree. Happy students, by contrast, do not appear to be hurt by unfavorable social comparisons (or bolstered by favorable ones).

Our second set of findings addressed the question of how people might balance two sets of social comparisons, which may or may not be hedonically conflicting. In line with our second hypothesis, unhappy students were relatively more susceptible to individual social comparison information in the context of relative group feedback. In Study 2, unhappy participants, but not happy ones, showed greater declines in positive mood and self-assessments of ability after news that their performance earned them last place on their team than news that they had actually placed first, regardless of whether they additionally learned that their teams had won or lost. The results from Study 1 were also supportive of our second hypothesis — at least in the group failure conditions. That is, unhappy individuals' moods and self-assessments following a team 'loss' appeared to be buffered by the additional news that they personally won first place. Specifically, unhappy students who learned that their team had lost (and received no individual feedback) rated their own performance lower, predicted their future performance to be lower, and showed larger decreases in overall positive affect than did unhappy students who additionally learned that they placed first on a losing team. Importantly, these effects were not found for happy participants.

The findings from Study 1 suggest that unhappy students, but not happy ones, may use favorable *individual* social comparison information to buffer the negative effects of the unfavorable *group* social comparison information (cf. Lyubomirsky & Ross, 1997). An intriguing possibility, however, is that happy individuals may not *need* this buffer. That is, happy people do not appear to suffer the same negative effects after receiving unfavorable group feedback — in part due to generally less vulnerability to *all* hedonically-tainted information and, additionally, perhaps, due to less identification and self-categorization as members of the type of minimal, temporary group created in our studies, a group unlikely to lead to high levels of identification or cohesion (cf. Tajfel & Turner, 1986; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Unhappy people, by contrast, may be especially needy of the information regarding their superior individual standing. Some support for this argument

is suggested in research on self-esteem. LSE individuals have been found to seek more social comparisons after 'success', especially when they expect the comparisons to be favorable, whereas HSE individuals seek more social comparisons after failure (Wood *et al.*, 1994). Thus, it appears that LSE individuals are inclined to use favorable social comparisons to bolster their self-esteem and well-being when the opportunity is easily available. Ironically, however, the 'buffer' of placing first only appeared to increase the self-assessments and positive affect of the unhappy individuals to the level of the happy ones (see Figure 2) (although, again, we cannot be certain of this observation without an appropriate control group). These findings are an important addition to the social comparison literature, illuminating individual differences in how people manage both favorable and unfavorable passive comparisons (see also Ahrens, 1991; McFarland & Miller, 1994).

An important contribution of our second study was our last set of results — namely, differences found between happy and unhappy participants for two variables expected to underlie individual differences in social comparison 'sensitivity'. First, the results showed that unhappy individuals, much more than happy ones, were rapidly revising their self-perceptions after receiving news of their accomplishment ('I knew it — they needed me!') or their flop ('I obviously did little for my team'). These findings suggest that unhappy individuals are relatively prone to adjust their self-perceptions after social comparison feedback, rather than rely on their own personal internal (rather than relative) standards and their own sense of their competence during their performance. Second, unhappy people were also more inclined than happy ones to hold themselves responsible for a poor showing in the competition ('I have never done well with analytical or verbal tests'), but fail to take full credit for their abilities in light of apparent personal success ('I was first, I knew what to expect') (cf. O'Leary-Kelly, 1998). These findings shed light not only on differences in sensitivity to the social comparison process shown by happy and unhappy individuals in these two studies (see also Lyubomirsky & Ross, 1997), but on differences in the two groups' responses to all kinds of hedonically-tainted information (Lyubomirsky, Kasri, & Zehm, 'Hedonic casualties of self-reflection', unpublished manuscript, 2001; Lyubomirsky & Ross, 1999; Lyubomirsky & Tucker, 1998; Seidlitz & Diener, 1993; Seidlitz *et al.*, 1997; see Lyubomirsky, 2001, for a review).

Limitations and Further Questions

A notable limitation of our research was that happiness was measured by self-report. Lacking a 'happiness meter' (or, indeed, any adequate measures of psychophysiology or brain function), the technique of self-nomination seemed, in spite of its limitations and potential sources of confounding, the best solution to the measurement problem. Moreover, this research concerns *subjective* happiness, for which the final judge should be 'whoever lives inside a person's skin' (Myers & Diener, 1995, p. 11; Diener *et al.*, 1999).

Because our studies were conducted in the laboratory, the question remains about how happy and unhappy individuals would respond to favorable and unfavorable social comparisons in their day-to-day world. For example, would happy students continue to be unaffected by social comparison feedback regarding their performance even if such feedback had significant and real-world implications? Suggestive evidence comes from a recent study that examined the responses of high school seniors during the college admissions process (Lyubomirsky & Ross, 1999). Students twice evaluated the colleges to which they had applied — once after they submitted their college applications, and once after they received acceptance and rejection letters. Happy students were found to be *more* inclined than unhappy ones to devalue the colleges that had rejected them, especially if those colleges had been their original first choice. Likewise, happy individuals might identify relatively more strongly with 'real-life' in-groups (Tajfel & Turner, 1986; Turner *et al.*, 1987) and, consequently, show stronger

reactions when these groups succeed or fail. In sum, it appears that happy individuals may indeed be sensitive to negative individual and group comparisons and behave in ways that dampen their impact, but perhaps only when the comparison really matters.

CONCLUSIONS AND IMPLICATIONS

The results of the present studies lead us to make two general conclusions — one clear and undeniable and the other more speculative. First, happy and unhappy individuals responded differently to social comparison information regarding both team and individual performance. Second, our findings suggested that social comparisons may serve different functions for happy and unhappy people. Happy students were relatively unaffected by the social comparison information presented in our two studies — that is, their self-assessments and affective responses were similar whether their team had ostensibly won or lost (Study 1) or whether they placed first or last, in the context of a team victory or defeat (Studies 1 and 2). Thus, happy individuals may have little use for such arbitrary and apparently uninformative social comparison feedback. Unhappy people, by contrast, may give heavy weight to social comparison information, thus, unwittingly, enhancing their vulnerability and perhaps even diminishing their happiness. These results support earlier research and speculations that happy and unhappy individuals may differ — in a way that supports their ‘affective temperaments’ — in their use of social comparison information (Lyubomirsky, unpublished dissertation, 1994; Lyubomirsky & Ross, 1997).

In contrast, in both studies, unhappy students seemed to be stung by unfavorable social comparisons. Furthermore, in Study 1, when they learned that they had personally performed well, the negative effects of unfavorable team comparisons were attenuated. And, in Study 2, after receiving ‘upward’ or ‘downward’ comparison feedback, unhappy individuals hastily revised not only their assessments of their abilities at the task, but their perceptions of their contributions to their team. Thus, although we did not measure this directly, we speculate that unhappy people may actively and effortfully try to manage and manipulate the social comparison process — albeit, in a way that still leaves them unhappy.

One implication of these findings is that unhappy individuals may be expending valuable cognitive resources (and increasing their cognitive ‘load’) (cf. Cohen & Spacapan, 1978; Gaillard, 1993; Gilbert, Giesler, & Morris, 1995) in the process of managing their cognitive and affective responses to relatively arbitrary feedback. Indeed, recent experiments reveal that after being out-performed, unhappy students subsequently reported excessive ‘dwelling’ on the self, required increased time to read a GRE passage and to complete an academic test, and showed impaired reading comprehension (Lyubomirsky *et al.*, unpublished manuscript, 2001). The present results suggest that receiving favorable individual feedback regarding their performance may help unhappy people sustain the negative hedonic consequences of unfavorable social comparisons, but theirs is a Pyrrhic victory at best. This strategy seems a poor prescription for well-being, for favorable social comparisons may be hard to come by, and, if one is looking for them, one may encounter many unfavorable comparisons in their stead. Ironically, although happy individuals did not appear to use one kind of feedback to help buffer the effects of another, they may not have needed to.

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REFERENCES

- Abramson LY, Seligman ME, Teasdale JD. 1978. Learned helplessness in humans: critique and reformulation. *Journal of Abnormal Psychology* **87**: 49–74.
- Affleck G, Tennen H. 1991. Social comparison and coping with serious medical problems. In *Social Comparison: Contemporary theory and research*, Suls J, Wills TA (eds). Erlbaum: Hillsdale, NJ; 369–393.
- Ahrens AH. 1991. Dysphoria and social comparison: combining information regarding others' performances. *Journal of Social and Clinical Psychology* **10**: 190–205.
- Aspinwall LG, Taylor SE. 1993. Effects of social comparison direction, threat, and self-esteem on affect, self-evaluation, and expected success. *Journal of Personality and Social Psychology* **64**: 708–722.
- Beck AT. 1967. *Depression: Clinical, experimental, and theoretical aspects*. Harper & Row: New York.
- Blanton H, Crocker J, Miller DT. 2000. The effects of in-group versus out-group social comparison on self-esteem in the context of a negative stereotype. *Journal of Experimental Social Psychology* **36**: 519–530.
- Brewer MB, Brown RJ. 1998. Intergroup relations. In *The Handbook of Social Psychology*, Gilbert DT, Fiske ST, Gardner L (eds). McGraw-Hill: New York; 554–594.
- Brewer MB, Weber JG. 1994. Self-evaluation effects of interpersonal versus intergroup social comparison. *Journal of Personality and Social Psychology* **66**: 268–275.
- Brickman P, Berman JJ. 1971. Effects of performance expectancy and outcome certainty on interest in social comparison. *Journal of Experimental Social Psychology* **7**: 600–609.
- Brickman P, Bulman R. 1977. Pleasure and pain in social comparison. In *Social Comparison Processes: Theoretical and empirical perspectives*, Suls JM, Miller RL (eds). Hemisphere: Washington, DC; 149–186.
- Brown JD, Novick NJ, Lord KA, Richards JM. 1992. When Gulliver travels: Social context, psychological closeness, and self-appraisals. *Journal of Personality and Social Psychology* **62**: 717–727.
- Buunk BP, Collins RL, Taylor WE, VanYperen NW, Dakof GA. 1990. The affective consequences of social comparison: Either direction has its ups and downs. *Journal of Personality and Social Psychology* **59**: 1238–1249.
- Buunk BP, Ybema JF. 1997. Social comparisons and occupational stress: The identification-contrast model. In *Health, Coping, and Well-being: Perspectives from social comparison theory*, Buunk BP, Gibbons FX (eds). Erlbaum: Mahwah, NJ; 359–388.
- Campbell A. 1981. *The Sense of Well-being in America*. McGraw-Hill: New York.
- Campbell JD. 1990. Self-esteem and clarity of the self-concept. *Journal of Personality and Social Psychology* **59**: 538–549.
- Cialdini RB, Richardson KD. 1980. Two indirect tactics of image management: Basking and blasting. *Journal of Personality and Social Psychology* **39**: 406–415.
- Cohen S, Spacapan S. 1978. The after effects of stress: An attentional interpretation. *Environmental Psychology and Nonverbal Behavior* **3**: 43–57.
- Diener E, Suh EM, Lucas RE, Smith HL. 1999. Subjective well-being: Three decades of progress. *Psychological Bulletin* **125**: 276–302.
- Festinger L. 1954. A theory of social comparison processes. *Human Relations* **7**: 114–140.
- Furr RM, Funder DC. 1998. A multi-modal analysis of personal negativity. *Journal of Personality and Social Psychology* **74**: 1580–1591.
- Gaillard AW. 1993. Comparing the concepts of mental load and stress. Special Issue: Psychophysiological measures in transport operations. *Ergonomics* **36**: 991–1005.
- Gibbons FX. 1986. Social comparison and depression: Company's effect on misery. *Journal Personality and Social Psychology* **51**: 140–148.
- Gibbons FX, Buunk BP. 1999. Individual differences in social comparison: Development of a scale of social comparison orientation. *Journal of Personality and Social Psychology* **76**: 129–142.
- Gibbons FX, Gerrard M. 1989. Effects of upward and downward social comparison on mood states. *Journal of Social & Clinical Psychology* **8**: 14–31.
- Gibbons FX, Gerrard M. 1991. Downward comparison and coping with threat. In *Social Comparison: Contemporary theory and research*, Suls J, Wills TA (eds). Erlbaum: Hillsdale, NJ; 317–345.
- Gilbert DT, Giesler RB, Morris KA. 1995. When comparisons arise. *Journal of Personality and Social Psychology* **69**: 227–236.
- Gruder C. 1977. Choice of comparison persons in evaluating oneself. In *Social Comparison Processes: Theoretical and empirical perspectives*, Suls JM, Miller RL (eds). Hemisphere: Washington, DC; 21–42.

- Hirt E, Zillmann D, Erickson G, Kennedy C. 1992. Costs and benefits of allegiance: Changes in fans' self-ascribed competencies after team victory versus defeat. *Journal of Personality and Social Psychology* **63**: 724–738.
- Hogg MA. 2000. Social identity and social comparison. In *Handbook of Social Comparison: Theory and research*, Suls JM, Wheeler L (eds). Kluwer Academic/Plenum Publishers: New York; 401–421.
- Kernis MH, Cornell DP, Sun C, Berry A, Harlow T. 1993. There's more to self-esteem than whether it is high or low: The importance of stability of self-esteem. *Journal of Personality and Social Psychology* **65**: 1190–1204.
- Larson R. 1989. Is feeling 'in control' related to happiness in daily life? *Psychological Reports* **64**: 775–784.
- Lockwood MH, Kunda DP. 1997. Superstars and me: Predicting the impact of role models on the self. *Journal of Personality and Social Psychology* **73**: 91–103.
- Lyubomirsky S. 1994. *The Hedonic Consequences of Social Comparison: Implications for enduring happiness and transient mood*. Unpublished doctoral dissertation, Department of Psychology, Stanford University.
- Lyubomirsky S. 2001. Why are some people happier than others? The role of cognitive and motivational processes in well-being. *American Psychologist* **56**: 239–249.
- Lyubomirsky S, Lepper HS. 1999. A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research* **46**: 137–155.
- Lyubomirsky S, Nolen-Hoeksema S. 1995. Effects of self-focused rumination on negative thinking and interpersonal problem-solving. *Journal of Personality and Social Psychology* **69**: 176–190.
- Lyubomirsky S, Ross L. 1997. Hedonic consequences of social comparison: A contrast of happy and unhappy people. *Journal of Personality and Social Psychology* **73**: 1141–1157.
- Lyubomirsky S, Ross L. 1999. Changes in attractiveness of elected, rejected, and precluded alternatives: A comparison of happy and unhappy individuals. *Journal of Personality and Social Psychology* **76**: 988–1007.
- Lyubomirsky S, Tucker KL. 1998. Implications of individual differences in subjective happiness for perceiving, interpreting, and thinking about life events. *Motivation and Emotion* **22**: 155–186.
- Major B, Testa M, Bylsma WH. 1991. Responses to upward and downward social comparisons: The impact of esteem-relevance and perceived control. In *Social Comparison: Contemporary theory and research*, Suls J, Wills TA (eds). Erlbaum: Hillsdale, NJ; 237–260.
- Major B, Sciacchitano AM, Crocker J. 1993. In-group versus out-group comparisons and self-esteem. *Personality and Social Psychology Bulletin* **19**: 711–721.
- Matlin MW, Gawron VJ. 1979. Individual differences in Pollyannaism. *Journal of Personality Assessment* **43**: 411–412.
- McFarland C, Miller DT. 1994. The framing of relative performance feedback: Seeing the glass as half empty or half full. *Journal of Personality and Social Psychology* **66**: 1061–1073.
- Morse S, Gergen KJ. 1970. Social comparison, self-consistency, and the concept of self. *Journal of Personality and Social Psychology* **16**: 148–156.
- Mussweiler T, Gabriel S, Bodenhausen GV. 2000. Shifting social identities as a strategy for deflecting threatening social comparisons. *Journal of Personality and Social Psychology* **79**: 398–409.
- Myers DG, Diener E. 1995. Who is happy? *Psychological Science* **6**: 10–19.
- O'Leary-Kelly AM. 1998. The influence of group feedback on individual group member response. In *Research in Personnel and Human Resources Management*, Ferris GR (ed.). JAI Press: Stamford, CT; 255–294.
- Rosenthal R, Rosnow R. 1985. *Contrast Analysis*. Cambridge University Press: Cambridge.
- Rosnow R, Rosenthal R. 1989. Definition and interpretation of interaction effects. *Psychological Bulletin* **105**: 143–146.
- Rosnow R, Rosenthal R. 1995. 'Some things you learn aren't so.' Cohen's paradox, Asch's paradigm, and the interpretation of interaction. *Psychological Science* **6**: 3–9.
- Ross L, Lepper MR, Hubbard M. 1975. Perseverance in self-perception and social perception: Biased attributional processes in the debriefing paradigm. *Journal of Personality and Social Psychology* **32**: 880–892.
- Runciman WC. 1966. *Relative Deprivation and Social Justice*. Routledge: London.
- Seidlitz L, Diener E. 1993. Memory for positive versus negative life events: Theories for the differences between happy and unhappy persons. *Journal of Personality and Social Psychology* **64**: 654–664.
- Seidlitz L, Wyer RS, Diener E. 1997. Cognitive correlates of subjective well-being: The processing of valenced life events by happy and unhappy persons. *Journal of Research in Personality* **31**: 240–256.
- Seta JJ, Seta CE. 1996. Big fish in small ponds: A social hierarchy analysis of intergroup bias. *Journal of Personality and Social Psychology* **71**: 1210–1221.
- Swallow SR, Kuiper NA. 1988. Social comparison and negative self-evaluations: An application to depression. *Clinical Psychology Review* **8**: 55–76.
- Tajfel H, Turner JC. 1986. The social identity theory of intergroup behaviour. In *Psychology of Intergroup Relations*, Worchel S, Austin WG (eds). Nelson: Chicago, IL; 7–24.

- Taylor SE, Aspinwall LG, Giuliano TA, Dakof GA, Reardon K. 1993. Storytelling and coping with stressful events. *Journal of Applied Social Psychology* **23**: 703–733.
- Taylor SE, Lobel M. 1989. Social comparison activity under threat: Downward evaluation and upward contacts. *Psychological Review* **96**: 569–575.
- Tesser A. 1988. Toward a self-evaluation maintenance model of social behavior. In *Advances in Experimental Social Psychology* (Vol. 21), Berkowitz L (ed.). Academic Press: New York; 181–222.
- Tesser A, Millar M, Moore J. 1988. Some affective consequences of social comparison and reflection processes: The pain and pleasure of being close. *Journal of Personality and Social Psychology* **54**: 49–61.
- Testa M, Major B. 1990. The impact of social comparison after failure: The moderating effects of perceived control. *Basic and Applied Social Psychology* **44**: 672–682.
- Turner JC, Hogg MA, Oakes PJ, Reicher SD, Wetherell MS. 1987. *Rediscovering the Social Group: A self-categorization theory*. Plenum: New York.
- Van der Zee K, Buunk BP, Sanderman R. 1996. The relationship between social comparison processes and personality. *Personality and Individual Differences* **20**: 551–565.
- Van der Zee K, Oldersma F, Buunk BP, Bos D. 1998. Social comparison preferences among cancer patients as related to neuroticism and social comparison orientation. *Journal of Personality and Social Psychology* **75**: 801–810.
- Watson D, Clark LA, Tellegen A. 1988. Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology* **54**: 1063–1070.
- Wayment HA, Taylor SE. 1995. Self-evaluation processes: Motives, information use, and self-esteem. *Journal of Personality* **63**: 729–757.
- Weary G, Elbin S, Hill MG. 1987. Attributional and social comparison processes in depression. *Journal of Personality and Social Psychology* **52**: 605–610.
- Wheeler L, Miyake K. 1992. Social comparison in everyday life. *Journal of Personality and Social Psychology* **62**: 760–773.
- Wills TA. 1991. Similarity and self-esteem in downward comparison. In *Social Comparison: Contemporary theory and research*, Suls J, Wills TA (eds). Erlbaum: Hillsdale, NJ; 51–78.
- Wood JV. 1989. Theory and research concerning social comparisons of personal attributes. *Psychological Bulletin* **106**: 231–248.
- Wood JV, Giordano-Beech M, Taylor KL, Michela JL, Gaus V. 1994. Strategies of social comparison among people with low self-esteem: Self-protection and self-enhancement. *Journal of Personality and Social Psychology* **67**: 713–731.
- Wood JV, Lockwood P. 1999. Social comparisons in dysphoric and low self-esteem people. In *The Social Psychology of Emotional and Behavioral Problems: Interfaces of social and clinical psychology*, Kowalski RM, Leary MR (eds). APA: Washington DC; 91–135.
- Wood JV, Taylor SE, Lichtman RR. 1985. Social comparison in adjustment to breast cancer. *Journal of Personality and Social Psychology* **49**: 1169–1183.