The Framing of Relative Performance Feedback
Seeing the Glass as Half Empty or Half Full

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ABSTRACT

It was proposed that individuals' responses to information regarding their relative position in a performance distribution would depend on how they frame the information. To the degree that they focus selectively on the positive features of the feedback (i.e., the number of others who performed worse than them) rather than the negative features (i.e., the number of others who performed better than them) they should report higher ability levels and more positive affective reactions. In Study 1, Ss received feedback indicating that they occupied a particular percentile standing in either a large or small distribution. Individuals with negative orientations (depressives and pessimists) reported lower ability levels as a function of increases in comparison group size, whereas individuals with positive orientations (nondepressives and optimists) reported higher ability levels. Presumably, these effects occurred because negatively oriented persons focused on the negative features of the feedback and positively oriented persons focused on the positive features of the feedback. The results of Study 2 support this explanation. Implications for the social comparison literature are discussed.

This research was supported by a Social Sciences and Humanities Research Council of Canada Research Grant and Canada Research Fellowship to Cathy McFarland. Thanks are extended to Roger Buehler, Darrin Lehman, and three reviewers for their helpful comments and to Anita Bloy, Shelley Loptson, and Sarah Newth for their experimental assistance.

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Received: December 23, 1992
Revised: September 27, 1993
Accepted: October 1, 1993

In assessing their abilities people commonly compare their performances with those of others. Often their performances can be compared with those of particular others, but frequently they can also be compared with a distribution that informs them where their performance stands in relation to all other performances. An example of the latter arises when students infer their ability in a subject from their position in a grade distribution. Most of what is known about the process of comparative self-evaluation comes from investigations of "selective" comparisons inspired by Festinger's (1954) theory of social comparison (for reviews see Suls & Miller, 1977; Suls & Wills, 1991; Wood, 1989). The present research seeks to begin to redress this imbalance by investigating factors that influence people's interpretations of comparative feedback that specifies their relative position within an entire performance distribution.

Although social comparison research has not focused extensively on investigating the mechanisms that underlie reactions to distributional information, there are some studies that show an importance of people's inferences about their relative standing in a distribution. A study by Brickman (1975), for example, revealed that individuals who received a higher relative standing in a distribution of four scores felt better about their score than those who received a lower relative standing. R. H. Smith, Diener, and Wedell (1989) asked subjects to evaluate individual scores from two distributions. The two distributions had the same range but different skewers. The results indicated that a given raw score in a positively skewed distribution was evaluated more positively than the same raw score in a negatively skewed distribution. Presumably, this effect occurred because there are more scores below the typical score in a positively skewed distribution than in a negatively skewed distribution.
Perhaps the most compelling demonstrations of the impact of perceptions of relative standing, however, derive from research focused on the "big fish in a little pond" effect (Bachman & O'Malley, 1986; Davis, 1966; Gibbons, 1985; Marsh, 1987; Marsh & Parker, 1984; Strang, Smith, & Rogers, 1978). This research addresses the following question: Do individuals feel better about themselves if they attend more prestigious schools (i.e., "big" ponds) or less prestigious schools (i.e., "small" ponds)? A study by Marsh (1987) provides an illustration of the basic frog-pond effect. He compared students who attended higher quality schools with those who attended lower quality schools in terms of academic self-concept. The "big pond—small pond" metaphor refers to the prestige of the school rather than the size of the school. Accordingly, a school was classified as a high-quality school on the basis of its student body's mean score on a standardized ability test. The findings revealed that after equating students in terms of "natural" ability (as assessed by standardized tests) students at lower quality schools possessed more positive self-concepts than those at higher quality schools. Paradoxically, the average student at a higher quality school felt worse about his or her ability than the average student at a lower quality school.

The frog—pond effect is pertinent to the present research because it appears to be mediated by individuals' perceptions of their relative standing within a group: Students at lower quality schools achieved higher standings in their classes (and therefore received higher grades [e.g., more A's and fewer D's]) than equally capable students at higher quality schools. Such findings illustrate the power of information regarding relative position because the effects of relative standing were apparent under circumstances that might be expected to counteract them. Individuals who performed well relative to their peers felt better about themselves than individuals who performed poorly relative to their peers even when the peer group from which a high relative performance was derived was less capable than the peer group from which a low relative performance was derived.

**Framing of Relative Performance Feedback**

The frog—pond studies indicate that different relative performance levels produce different reactions: People with higher relative performance levels (e.g., 70th percentile) have more positive reactions than those with lower levels (e.g., 30th percentile). However, these studies do not provide information concerning the factors that influence the positivity of individuals' reactions to particular relative performance levels. Consider, for example, people's responses to feedback indicating that they are at position 700 in a distribution of 1,000 scores (i.e., 300 others performed above their score, and 699 others performed below their score). It is possible that two individuals could interpret this feedback quite differently, leaving them with distinctly different perceptions of their abilities and discrepant emotional reactions. What might be the basis for these different construals? One possibility is that individuals may differ in terms of the features of a distribution that they focus their attention on. Some people may focus selectively on the number of people who did better than them, whereas others may focus selectively on the number of people who did worse than them. Thus, different responses may arise because some persons "see the glass as half empty," whereas others "see the glass as half full."

**Positive Versus Negative Framing**

According to this analysis the positivity of individuals' orientations toward life is one factor that should influence their interpretations of relative performance feedback. People with negative orientations (e.g., pessimists and depressives) should focus on the number of individuals who performed better than them, whereas people with positive orientations (e.g., optimists and nondepressives) should focus on the number of individuals who performed worse than them. The voluminous literature exploring information-processing differences between dysphorics and nondysphorics is consistent with this reasoning (for reviews see Alloy & Abramson, 1988; Alloy, Albright, Abramson, & Dykman, 1990; Coyne & Gotlib, 1983; Swann, 1990; Taylor & Brown, 1988). The greater tendency of nondysphorics to process information in a manner that reflects favorably on the self has been observed in a variety of judgment domains, including perceptions of control (e.g., Alloy & Abramson, 1979; Vazquez, 1987), evaluations of the self (e.g., Bargh & Tota, 1988; Brown, 1986; Gotlib & McCann, 1984; Kuiper & McDonald, 1982; Lewinsohn, Mischel, Chaplin, & Barton, 1980), perceptions of feedback and other stimuli (e.g., Dykman, Abramson, Alloy, & Hartlage, 1989; Dykman & Volpicelli, 1983; Matthews & Antes, 1992; Vestre & Caulfield, 1986), recollections of past events (e.g., Blyney, 1986; DeMonbreun & Craighead, 1977; Gotlib, 1983; Pyszczynski, Hamilton, Herring, & Greenberg, 1989), predictions and expectations regarding future events (e.g., Ahrens, Zeiss, & Kanfer, 1988; Alloy & Ahrens, 1987; Andersen, Speilman, & Bargh, 1992; Dunning & Story, 1991; Dykman, Abramson, & Albright, 1991; Lewinsohn, Steinmetz, Larsen, & Franklin, 1981; Pyszczynski, Holt, & Greenberg, 1987), comparative ratings of self in relation to others (e.g., Ahrens et al., 1988; Alloy, Albright, & Clements, 1987; Brown, 1986; Campbell, 1986; Crocker, Thompson, McGraw, & Ingerman, 1987; Swallow & Kuiper, 1987; Tabachnik, Crocker, & Alloy, 1983), attributions for events (Sweeney, Anderson, & Bailey, 1986), and preferences for feedback (Swann, 1990).
Two recent studies that investigated the impact of dysphoria on the social comparison process are directly relevant to the current predictions. Ahrens (1991) exposed dysphoric and nondysphoric subjects to information regarding the performance of either one or two other subjects. Specifically, they learned either (a) that one other subject had performed better than them (unfavorable comparison condition), (b) that one other subject had performed worse than them (favorable comparison condition), or (c) that one other subject had performed better than them and one other subject had performed worse than them (mixed comparison condition). The results indicated that dysphoric subjects reported lower ability levels than nondysphoric subjects only when they were not forced to attend to one particular type of comparison information (i.e., in the mixed comparison condition). Furthermore, dysphorics responded similarly to mixed and unfavorable comparison information, whereas nondysphorics responded similarly to mixed and favorable comparison information. This pattern of findings is consistent with the notion that dysphorics may attend selectively to individuals who perform better than themselves, whereas nondysphorics may attend selectively to those who perform worse than themselves.

Wheeler and Miyake (1992) obtained similar results in a study that required respondents to keep a record of all of their social comparisons for a 2-week period. Individuals with chronically low self-esteem, as well as individuals experiencing negative mood states, were less likely than their counterparts to report making downward comparisons during the course of the study.

**Comparison Group Size and Reactions to Feedback**

Taken together, the findings discussed above imply that individuals with negative orientations will respond to feedback regarding their relative position in a performance distribution by focusing on those individuals who performed better than them and that those with positive orientations will focus on those who performed worse than them. If this reasoning is correct, an interesting prediction follows: Individuals' reactions to relative feedback should be influenced by the absolute size of the comparison group or distribution. Specifically, negatively oriented people should perceive the identical performance level (e.g., 70th percentile) less favorably when it is derived from a large sample (e.g., position 700 in 1,000) than when it is derived from a small sample (e.g., position 7 in 10). This effect should occur because they should focus on the number of others who did better than them, and there is always a higher absolute number of such individuals in a larger sample (300) than in a smaller sample (3), given the same relative position. Positively oriented people, on the other hand, should perceive the identical relative performance level more favorably when it is derived from a large sample than when it is derived from a small sample. This effect should occur because they should focus on the number of others who did worse than them, and there is always a higher absolute number of such individuals in a larger sample (699) than in a smaller sample (6). In other words, this logic predicts that differences between positively and negatively oriented persons should be most pronounced when feedback is based on a large sample and least pronounced when feedback is based on a small sample.

**Study 1**

Study 1 examined the impact of comparison group size and orientation on people's perceptions of their abilities. In this experiment subjects with different orientations (as assessed by measures of optimism and depression) were provided with feedback concerning their percentile standing in a distribution of scores derived from a social perceptive test (e.g., 70th percentile). The feedback was based on either a large sample (e.g., Position 700 in a group of 1,000) or a small sample (e.g., Position 7 in a group of 10). Subjects' perceptions of their ability were then assessed. It was expected that orientation would interact with comparison group size in influencing subjects' judgments of their abilities. That is, differences between positively and negatively oriented individuals should be most pronounced when feedback is based on a large sample.

To explore the generality of the proposed interaction effect, the positivity of feedback was also varied. Some subjects received positive feedback (e.g., 70th percentile), and others received negative feedback (e.g., 30th percentile). It was expected that the interaction between orientation and comparison group size would be obtained under both conditions. Preexisting tendencies for people to focus on one end of the distribution or another should influence ability inferences across performance levels.

It should be noted that the inclusion of the variable of feedback positivity also allowed for an assessment of whether individuals are sensitive to normative criteria in making their ability judgments. If subjects recognize that feedback based on larger samples provides a more reliable assessment of their true position, one would expect an interaction between performance level and comparison group size (i.e., stronger reactions to positive and negative feedback under large sample conditions).
Method

Subjects.
Subjects were 180 undergraduates (58 men and 122 women) recruited from a variety of introductory classes at Simon Fraser University. They participated individually in 1-hr sessions and were paid $5 for their participation.

Procedure.

Initially, subjects were informed that the purpose of the study was to explore the relations between personality traits and social percepitiveness ability—"the ability to accurately judge other people's moods, traits, and motives." Social percepitiveness was described as an important attribute that is linked to a variety of positive outcomes (e.g., occupational success, fulfillment in relationships, and so forth). Consistent with the cover story, the experimenter indicated that during the session subjects would take a social percepitiveness test and then complete a personality survey. She explained that before the test, however, she would like them to complete a brief survey (allegedly for another researcher). This survey, entitled "Sex Differences in Emotional Reactions," included two measures reflecting the positivity of subjects' orientations (the Beck Depression Inventory [BDI]; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; and the Life Orientation Test [LOT]; Scheier & Carver, 1985). They were assured of the anonymity of their responses and instructed to place their completed survey into a sealed envelope and then to place it amongst a pile of completed surveys.

After completing the questionnaire, subjects were provided with more details about the social percepitiveness test. They learned that they would be exposed to 20 drawings through a tachistoscope and that their emotional arousal in response to each picture would be monitored with a galvanic skin response recorder and entered directly into a microcomputer. Presumably, the degree of arousal they experienced in response to the drawings reflected their level of social percepitiveness. The drawings were adapted from the Thematic Apperception Test cards that depicted two or more individuals interacting. After exposing subjects to the pictures, the experimenter took a seat at the microcomputer and explained that she would calculate their scores and then provide them with feedback about their performance. After a few minutes, she presented them with a feedback sheet and left the room.

Manipulations of comparison group size and positivity of feedback.

At the top of the feedback sheet subjects were reminded that their arousal levels in response to the pictures reflected their level of social percepitiveness. The remainder of the feedback sheet took the following general format:

We have had ___ people in our study so far. We have ranked these people in terms of how aroused they became to the pictures. You were at position ___. That is, ___ people were more aroused than you and ___ people were less aroused than you. So, ___ people were worse than you in social percepitiveness and ___ people were better than you in social percepitiveness.

There were two levels of comparison group size. Subjects in the large sample condition were told that there had been 1,000 participants, and those in the small sample condition were told that there had been 10. There were two levels of feedback positivity. Subjects learned either that they had performed well (positive feedback) or poorly (negative feedback) in relation to others. To avoid confounding the positivity of feedback with position in the distribution (high or low) there were two versions of positive feedback and two versions of negative feedback. Half of the subjects in each feedback condition were informed (at the top of the feedback sheet) that higher arousal levels reflected higher social percepitiveness ability; the other half of the subjects were told that higher arousal levels reflected lower social percepitiveness ability. This variation yielded two forms of positive feedback. Within each form, there was a small group variation (indicated in parentheses below) and a large group variation. In the first version, subjects were informed that they were at Position 700 (7), that 300 (3) people had higher arousal levels (performed better than them) and 699 (6) people had lower arousal levels (performed worse than them). In the second version of positive feedback, subjects were informed that they were at Position 300 (3), that 299 (2) people had lower arousal levels (performed better than them), and that 700 (7) people had higher arousal levels (performed worse than them). There were also two versions of negative feedback. In the first version, subjects were informed that they were at Position 300 (3), that 700 (7) people had higher arousal levels (performed better than them) and that 299 (2) people had lower arousal levels (performed worse than them). In the second version, subjects were informed that they were at Position 700 (7), that 699 (6) people had lower arousal levels (performed better than them), and that 300 (3) people had higher arousal levels (performed worse than them).

Dependent measures.
After allowing subjects a few minutes to contemplate the feedback, the experimenter returned with a questionnaire. She informed them that she was interested in obtaining their reactions to the study thus far because these might affect their responses to the personality survey. They were assured of the anonymity of their responses and instructed to place their completed questionnaire in an envelope and place it amongst a pile of other completed questionnaires.

Three questions assessing subjects' perceptions of their abilities were included: (a) "How good are you at accurately interpreting social situations?" (from not at all good [1] to extremely good [9]), (b) "How socially perceptive do you think you are?" (from not at all perceptive [1] to extremely perceptive [9]), (c) "How would you classify your level of social perceptiveness?" (extremely low [1], very low [2], low [3], average [4], high [5] very high [6], or extremely high [7]). Two additional questions assessed subjects' perceptions of the validity and reliability of feedback: (a) "How accurate do you think the assessment of your degree of social perceptiveness is?" (from not at all accurate [1] to extremely accurate [9]) and (b) "How confident are you that if your degree of emotion were tested again (using the pictures) your measured degree of emotion, as compared to others, would be the same?" (from not at all confident that my level of emotion as compared to others would stay the same [1] to extremely confident that my level of emotion as compared to others would stay the same [9]). After completing the survey, subjects were probed for suspicions and debriefed.

Results

An index reflecting subjects' perceptions of their abilities was created by averaging across their standardized scores (z scores) on the three dependent measures. The internal consistency of this index was high (α = .93). A measure reflecting the positivity of subjects' orientations was created by taking the average of their z scores on the depression measure and optimism measure (which was scored in reverse so that higher scores reflect greater pessimism). The correlation between these measures was .68 (p < .001). Subjects who scored at or above the median were placed into the negative orientation category, and those who scored below the median were placed into the positive orientation category.2

Perceptions of ability.

The differential focus hypothesis predicts that regardless of the positivity of feedback, positively oriented individuals should report higher abilities when feedback is derived from a larger sample and negatively oriented individuals should report lower abilities when feedback is derived from a larger sample. Scores on the social perceptiveness index were analyzed in a 2 (orientation: positive vs. negative) × 2 (comparison group size: small vs. large) × 2 (positivity of feedback: positive vs. negative) analysis of variance (ANOVA). This analysis yielded main effects for orientation, F(1, 172) = 11.58, p < .001, and feedback positivity, F(1, 172) = 20.35, p < .0001. Positively oriented persons reported higher abilities (M = +.22) than did negatively oriented persons (M = −.15). In addition, subjects given positive feedback (M = +.26) reported higher abilities than did subjects given negative feedback (M = −.28).

The main effects were qualified by a significant three-way interaction, F(1, 172) = 5.16, p < .03. Sample effects analyses conducted to assess the source of this interaction revealed support for the hypotheses. The predicted interaction between comparison group size and orientation was obtained under negative feedback conditions, F(1, 172) = 8.36, p < .01. Examination of the left half of Table 1 reveals that subjects with negative orientations reported significantly lower ability levels when the feedback was derived from a larger sample (M = −.90) than when it was derived from a smaller sample (M = −.19), t(172) = 2.73, p < .01. In contrast, subjects with positive orientations reported somewhat higher ability levels when the feedback was derived from a larger sample (M = +.17) than when it was derived from a smaller sample (M = −.22), t(172) = 1.50, p < .15. Also as predicted, differences between positively (M = +.17) and negatively oriented individuals (M = −.90) were revealed only when feedback was derived from a large sample, t(172) = 4.11, p < .0001.

The pattern of interaction revealed in the negative feedback conditions did not occur in the positive feedback conditions (F < 1). Simple effects analyses of the positive feedback conditions revealed only a main effect for orientation, F(1, 172) = 4.14, p < .05. Positively oriented subjects reported higher ability levels (M = +.50) than did negatively oriented subjects (M = +.13).3

Sensitivity to sample size.

In the introduction it was noted that if subjects apply proper rules of statistical inference in making ability inferences one would expect an interaction between positivity of feedback and comparison group size: Reactions to positive and negative feedback should become more polarized as sample size increases. This interaction was not significant, F(1, 172) = .25,
The means relevant to this interaction can be derived from Table 1. Subjects did not report higher ability levels when positive feedback was based on a larger sample \((M = +.21)\) rather than a smaller sample \((M = +.30, t < 1)\). Similarly, they did not report significantly lower ability levels when negative feedback was based on a larger sample \((M = -0.37)\) rather than a smaller sample \((M = -0.20, t < 1)\).

The results of analyses conducted on subjects' ratings of the quality of feedback offer an explanation for these null effects. Apparently, subjects failed to recognize that relative feedback based on larger samples provided a better assessment of their abilities. A \(2 \times 2 \times 2\) ANOVA performed on an index created by averaging scores on the two measures reflecting quality of feedback revealed no significant main effects or interactions involving comparison group size. Feedback derived from a small sample \((M = 5.91)\) was evaluated as highly as feedback derived from a larger sample \((M = 5.66)\). A main effect for positivity of feedback on this index indicated that positive feedback \((M = 6.43)\) was evaluated as more accurate and reliable than negative feedback \((M = 5.08), F(1, 172) = 31.21, p < .0001\). The means and standard deviations on this index for the full design are presented in Table 2.

**Discussion**

The results of Study 1 were generally supportive of the predictions. After receiving negative feedback regarding their relative position in a group, negatively oriented persons reported lower ability levels when the feedback was derived from a large rather than a small sample, whereas positively oriented persons reported somewhat higher ability levels when the feedback was derived from a large rather than a small sample.

Interestingly, comparison group size did not interact with subject orientation in the positive feedback condition. It was predicted that the larger the group in which a good performance occurred the more favorably the performance would be perceived by individuals with a positive orientation and the less favorably it would be perceived by individuals with a negative orientation. In retrospect, the disconfirmation of this prediction may not be surprising. Positive or expected outcomes often do not trigger as deep or thoughtful analyses as negative or unexpected outcomes (Bohner, Bless, Schwarz, & Strack, 1988; Holtzworth-Munroe & Jacobson, 1985; Pyszczynski & Greenberg, 1981; Wong & Weiner, 1981). Subjects of both orientations appear simply to have felt good about positive feedback and reflected little about it.

**Study 2**

The results of Study 1 indicate that ability inferences based on negative relative performance feedback depend on the positivity of individuals' orientations and the absolute size of their comparison group. People with negative orientations report lower ability levels as a function of increases in comparison group size, whereas those with positive orientations report higher ability levels. The preferred explanation for these effects is that people's orientations lead them to focus on different features of the distribution. Presumably, people with negative orientations focus selectively on the number of others who performed better than them and those with positive orientations focus selectively on the number of others who performed worse than them.

**Effects of Framing**

Study 2 was designed to assess the validity of the above explanation. If the effects of increases in group size result from selective attention, then manipulating individuals' focus of attention should influence their reactions in systematic ways. Specifically, the reactions of positively oriented individuals should be modified most by feedback that focuses them on the number of people who performed better than them, whereas the reactions of negatively oriented individuals should be modified most by feedback that focuses them on the number of people who performed worse than them.

To test these predictions, subjects were exposed to one of three forms of negative feedback regarding their relative position in a large comparison group. The first type of feedback was designed to focus subjects on the number of people who performed better than them (negative focus feedback), and the second type was designed to focus them on the number of people who performed worse than them (positive focus feedback). The third type of feedback was nonselective, and subjects were free to direct their attention to either feature of the distribution (optional focus feedback). This type of feedback was identical to that used in Study 1. Subjects' affective reactions in response to the feedback were assessed. It was expected that negatively oriented people would report more positive affective reactions in the positive focus condition than in either of the other two conditions. Furthermore, if it is true that they normally focus their attention on the number of people who did better than them, there should be no difference in affect between the negative focus and optional focus conditions. In contrast, it was expected that positively oriented people would report more negative affective
reactions in the negative focus condition than in either of the other two conditions. In addition, if they normally focus their attention on the number of people who did worse than them, there should be no differences in affect between the positive focus and optional focus conditions.

**Conceptual Replication**

As noted earlier, Study 2 examined people's affective reactions to relative performance feedback rather than their ability inferences. To explore whether the interaction between orientation and comparison group size obtained in Study 1 could be replicated on affect measures, one additional group was run in Study 2. In this condition, subjects were provided with optional focus negative feedback allegedly derived from a small comparison group. The affective reactions of subjects in this condition were compared with those of subjects who received optional focus negative feedback based on a large comparison group. It was expected that individuals with positive orientations would report more positive affective reactions as a function of increases in sample size, whereas individuals with negative orientations would report more negative affective reactions as a function of such increases.

**Method Subjects.**

Subjects were 112 undergraduates (44 men and 68 women) recruited from a variety of introductory classes at Simon Fraser University. They participated individually in 1-hr sessions and were paid $5 for their participation.

**Procedure.**

The procedures in this study were identical to those of Study 1 up to the point at which subjects were provided with performance feedback. To test the "selective attention" interpretation of the findings of Study 1, 80 of the 112 subjects in the current study were randomly assigned to one of three forms of feedback regarding their performance standing in a large comparison group. The subjects in all three of these conditions were informed (a) that higher arousal levels reflected lower social perceptiveness ability, (b) that there had been 1,000 participants, and (c) that the participants had been rank ordered in terms of their arousal levels, and they were at position 700 in the group (negative feedback). In the positive focus condition, subjects were told that being at position 700 meant that 300 people were worse than them in terms of social perceptiveness ability. In the negative focus condition, subjects were told that being at position 700 meant that 699 people were better than them in terms of social perceptiveness ability. In the optional focus condition, subjects were told that being at position 700 meant that 699 people were better than them and 300 people were worse than them in terms of social perceptiveness ability.

The remaining 32 subjects in Study 2 were provided with optional focus feedback based on a small comparison group. Specifically, they were informed that they were at position 7 in a group of 10 and that this meant that 3 people were worse than them and 6 people were better than them in terms of social perceptiveness ability.

**Dependent measures.**

After allowing the subjects a few minutes to examine the feedback sheet, the experimenter presented them with a questionnaire. As in Study 1, they were (a) informed that we were interested in their reactions to the study thus far because these might influence their responses to the personality survey and (b) assured of the anonymity of their responses.

Subjects were asked to report their current affective state on five dimensions (tense, anxious, uncomfortable, disappointed, and sad) on a scale ranging from 1 (not at all) to 9 (extremely). In addition, they rated the reliability and validity of the feedback on the same scales used in Study 1. Subjects were debriefed immediately after completing the questionnaire.

**Results**

Initially, the five mood measures were subjected to a principal-components factor analysis with oblique rotations. This analysis yielded two factors with eigen values greater than 1. The first factor (labeled Anxiety) consisted of the items tense, anxious, and uncomfortable. The second factor (labeled Sadness) consisted of the items sad and disappointed. The correlation between the factors was .48.
Impact of comparison group size and orientation on mood.

To explore the effect of comparison group size and orientation on affective reactions, subjects' average scores on the sadness and anxiety items were subjected to a 2 (orientation: positive vs. negative) × 2 (comparison group size: small vs. large) × 2 (type of affect: anxiety vs. sadness) ANOVA. Only those subjects who received optional focus feedback were included in the analysis.

This analysis revealed a significant interaction between comparison group size and orientation that supported the predictions, $F(1, 54) = 7.96, p < .01$. The means pertinent to this interaction are presented in Table 3.

As predicted, negatively oriented subjects reported significantly more negative affect when the feedback was derived from a larger sample ($M = 4.59$) than when it was derived from a smaller sample ($M = 3.00$), $t(54) = 2.12, p < .05$. This difference was significant on both the sadness items, $t(86) = 3.31, p < .01$, and the anxiety items, $t(86) = 2.96, p < .01$. In contrast, positively oriented subjects reported somewhat less (although not significantly less) negative affect when the feedback was derived from a larger sample ($M = 2.66$) than when it was derived from a smaller sample ($M = 3.17, t < 1$). This pattern was present on both the sadness items ($t < 1$) and the anxiety items, $t(86) = 1.30, p < .20$. As expected, differences between individuals with positive ($M = 2.66$) and negative orientations ($M = 4.59$) were revealed only when feedback was derived from a large sample, $t(54) = 2.50, p < .02$. This difference was significant on the anxiety items, $t(86) = 2.95, p < .01$, and the sadness items, $t(86) = 3.15, p < .01$.

Perceptions of the quality of feedback.

A 2 (orientation: positive vs. negative) × 2 (comparison group size: small vs. large) ANOVA performed on the index reflecting subjects' perceptions of the quality of the feedback revealed no significant effects of group size. Again, subjects rated feedback derived from a small sample ($M = 4.98$) as positively as feedback derived from a larger sample ($M = 5.00, t < 1$).

Impact of orientation and focus of attention on mood.

The next analysis explored the effects of the focusing manipulation and subjects' orientations on affective reactions. Subjects' average scores on the sadness and anxiety items were subjected to a 2 (orientation: positive vs. negative) × 3 (type of feedback: optional focus vs. positive focus vs. negative focus) × 2 (type of affect: anxiety vs. sadness) ANOVA. Affect type was a repeated measures factor. This analysis yielded a main effect for orientation, $F(1, 74) = 14.24, p < .005$, and a marginal interaction between orientation and type of feedback, $F(2, 74) = 2.61, p < .08$, that were qualified by a three-way interaction involving orientation, type of feedback, and type of affect, $F(2, 74) = 3.02, p = .054$. An examination of the pattern of means and contrasts pertinent to the three-way interaction reveals that the predictions regarding individuals with negative orientations were supported on the sadness items and that those regarding individuals with positive orientations were supported on the anxiety items (see Table 4).

It was predicted that individuals with positive orientations would feel worse after receiving negative focus feedback than after receiving either positive focus or optional focus feedback. This prediction was confirmed on the anxiety items. Positively oriented subjects reported more anxiety when they were focused selectively on the number of people who did better than them ($M = 4.50$) than when they were focused selectively on the number of people who did worse than them ($M = 2.93$), $t(134) = 2.12, p < .05$, or when they were free to focus on either feature of the distribution ($M = 2.77$), $t(134) = 2.58, p < .05$. Also consistent with predictions, there were no significant differences in anxiety (or sadness) between the positive focus and optional focus conditions among subjects with positive orientations ($p > .10$).

Individuals with negative orientations were expected to feel better after receiving positive focus feedback than after receiving either negative focus or optional focus feedback. This prediction was confirmed on the sadness items. Negatively oriented subjects reported less sadness when they were focused selectively on the number of people who performed worse than them ($M = 2.96$) than when they were focused selectively on the number of people who performed better than them ($M = 3.97$), $t(134) = 1.87, p < .08$, or when they were free to focus on either feature of the distribution ($M = 4.55$), $t(134) = 2.34, p < .05$. Also as expected, there were no significant differences in sadness (or anxiety) between the negative focus and optional focus conditions among subjects with negative orientations ($p > .10$).

Discussion
The results of Study 2 extend the initial findings in two ways. First, they indicate that affective reactions to relative performance feedback are influenced by individuals' orientations and the size of the comparison group in the same manner as ability inferences are. Second, the findings support the hypotheses regarding the selective attention explanation of the results of Study 1. As predicted, negatively oriented people were more affected by selective feedback that focused them on the positive features of the distribution than selective feedback that focused them on the negative features. In contrast, positively oriented people were more affected by selective feedback that focused them on the negative features of the distribution than selective feedback that focused them on the positive features.

Unexpectedly, the impact of framing was manifested on different factors. The predictions regarding persons with negative orientations were confirmed on measures of sadness but not on measures of anxiety, whereas those regarding persons with positive orientations were confirmed on measures of anxiety but not on measures of sadness. Again, in retrospect these effects seem plausible. Positively oriented individuals typically do not attend to unfavorable information and therefore may be less adapted to it than are negatively oriented individuals. Consequently, positively oriented persons may be more threatened than saddened when they are forced to attend to unfavorable information, and negatively oriented persons may be more pleased than relieved when they are forced to consider favorable information.

**General Discussion**

The common observation that the same glass can be seen as half full or half empty illustrates a basic truth about human perception: People looking at the same thing can view it very differently. One person can see "bad news" where another sees "good news," and vice versa. These views do not differ in terms of accuracy—the glass is both half full and half empty—but in terms of optimism or pessimism. The present studies provide a clear demonstration of this individual difference. When confronted with a performance distribution in which there were individuals who did better and worse than themselves, individuals with a negative orientation (pessimists and dysphorics) appeared to focus on those individuals who did better, whereas individuals with a positive orientation (optimists and nondysphorics) did the opposite. Evidence for this came from two sources. First, the reactions of individuals with positive and negative orientations to the same relative standing became more polarized as the size of the comparison group, and hence the absolute number of people who did better and worse than them, increased (Study 1). Second, in Study 2 subjects' affective reactions were uninfluenced by feedback that focused them selectively on a feature of the distribution that they normally attend to and were altered by feedback that focused them on a feature of the distribution that they normally ignore. When encouraged to change their usual focus of attention, individuals with negative orientations reported more pleasant affective reactions and individuals with positive orientations reported more unpleasant affective reactions.

In general, the predicted effects were stronger for individuals possessing negative orientations than for those possessing positive orientations. Although positively oriented persons were influenced significantly by the focusing manipulation in Study 2, the effects of comparison group size (in both studies) did not meet conventional levels of significance. Two explanations for the weaker effects among positively oriented subjects can be offered. First, positively oriented people tend to evaluate performance feedback more favorably than negatively oriented people. In general, regardless of individuals' orientations, the more favorably feedback is evaluated, the less stringently it is analyzed. Thus, positively oriented subjects may have been less influenced by variations in comparison group size because they examined the feedback less extensively than did negatively oriented subjects. Second, positively oriented persons may possess more variable focusing styles than negatively oriented persons. Although positively oriented individuals may typically focus on those performing worse than themselves, there may be occasions when they focus on those performing better (e.g., when they are attempting to motivate themselves or improve their skills: Taylor & Lobel, 1989; Wood & Taylor, 1991). Future research investigating the comparison goals of positively and negatively oriented individuals may help clarify the circumstances under which they compare upward or downward as well as their reactions to these comparisons.

**Generalizability of the Effects**

In the present research, the performance feedback was structured in a way that would inform subjects of their percentile standing without informing them of their own score, or their comparison group's average score, on the overall performance scale. It would be informative to know whether the current findings generalize to contexts in which individuals possess all relevant performance information. A prominent model of performance satisfaction is range—frequency theory (Mellers & Birnbaum, 1983; Parducci, 1968, 1984; R. H. Smith et al., 1989). According to this theory, an individual's satisfaction with his or her performance level is a joint function of two factors: the range of the score (i.e., the degree to which the score is high on the performance scale) and the frequency of the score (i.e., the percentage of the distribution falling below the score). The present findings suggest an additional factor that may
influence people's satisfaction with their performances: their tendency to focus on either the positive or negative features of the distribution. It would be expected that the effects of focusing on the negative features of a distribution should be particularly pronounced when the comparison group is situated at the bottom of the performance scale ("Even people who aren't that good did better than me") and minimized when the comparison group is situated at the top of the performance scale ("There are people performing better than me, but we are all quite good"). In contrast, the effects of focusing on the positive features of the distribution should be particularly pronounced when the comparison group is situated at the top of the performance scale ("I'm doing better than some really capable people") and minimized when the comparison group is situated at the bottom of the performance scale ("I'm doing better than others, but none of us are very capable").

The Origins of Framing Effects

In addition to exploring the generalizability of the findings, future work is needed to identify more precisely the mechanisms underlying the effects. Although the results indicated that individuals' orientations mediated their reactions to relative feedback, the exact means by which this effect occurred are not known. Individuals with positive orientations (nondepressives and optimists) differ from those with negative orientations (depressives and pessimists) on at least two dimensions that might influence their framing of feedback: the positivity of their mood states and the accessibility of negative self-constructs (Blaney, 1986; Segal, 1988). Thus, the present effects could be attributed to "pure" schematic processing (i.e., negative self-constructs producing negative interpretations of self-relevant information; Segal, 1988) or to mood-congruent processing (i.e., negative mood leading to the priming of negative self-constructs, which in turn produce negative interpretations of self-relevant information; Forgas, Bower, & Moylan, 1990; Rhodes, Riskind, & Lane, 1987). Investigations that were similar to the present ones, but that (a) varied the negativity of self-constructs while holding constant mood, or (b) varied temporary mood states while holding constant the negativity of preexisting self-constructs, would shed light on the validity of these two accounts (Dent & Teasdale, 1988; Gotlib & McCann, 1984).

Dysphoria and Social Comparison

The current research is relevant to the debate among social comparison researchers as to whether dysphoric persons (e.g., those who are depressed, suffering from low self-esteem, or are threatened in some way) are more or less likely than non-dysphoric persons to engage in comparisons that reflect favorably on the self. There are two competing perspectives on this issue. According to the first perspective, the tendency of dysphorics to process social information in a more negative way than non-dysphorics should lead them to engage in less self-enhancing social comparisons (see references in the introduction). According to the second perspective, one should expect greater self-enhancement among dysphorics because they should be more motivated than non-dysphorics to engage in efforts to improve their affective states (Clark & Isen, 1982; Wills, 1981).

Although some studies have obtained results that are consistent with the latter viewpoint (Friend & Gilbert, 1973; Gibbons, 1986; Gibbons & Gerrard, 1991; Hakmiller, 1966; R. H. Smith & Insko, 1987; Wills, 1991; Wood & Taylor, 1991), alternative interpretations of the effects have been offered (for a review of alternative accounts see Wheeler & Miyake, 1992). Furthermore, there is a growing body of recent evidence that supports the first perspective. Dysphorics appear to be less likely than non-dysphorics to (a) show a self-enhancement bias when asked to rate themselves in comparison with others (Alloy & Ahrens, 1987; Alloy et al., 1987; Brown, 1986; Campbell, 1986; Crocker et al., 1987; Tabachnik et al., 1983), (b) report making downward comparisons in their day-to-day lives (Wheeler & Miyake, 1992), and (c) attend to the performance of another individual who is performing worse than themselves (Ahrens, 1991). The present findings offer additional evidence supportive of the conclusion that dysphorics deal with social comparisons in a self-depreciating manner. When provided with feedback regarding their relative standing in a performance distribution, negatively oriented individuals were more likely than their counterparts to focus selectively on the number of individuals who performed better than themselves.

Affective Consequences of Upward and Downward Comparisons

The current results are relevant to the emerging literature regarding how people respond to upward and downward comparisons. Individuals who normally focus upward (i.e., negatively oriented persons), as well as those who were encouraged to focus upward (i.e., positively oriented persons), reported negative reactions in response to relative feedback, whereas those who normally focus downward (i.e., positively oriented persons), as well as those who were encouraged to focus downward (i.e., negatively oriented persons), reported positive reactions. These effects parallel those obtained in previous research. Downward comparisons have often been found to produce more positive reactions than upward comparisons (Brown, Novick, Lord, & Richards, 1992; Gibbons, 1986; Gibbons & Boney McCoy, 1991;
Major, Testa, & Bylsma, 1991; Morse & Gergen, 1970; Salovey & Rodin, 1984; Tesser, Millar, & Moore, 1988; Wheeler & Miyake, 1992). Taken together, these findings have practical relevance for those who must deliver performance feedback to others (e.g., coaches, managers, teachers, and so forth): Recipients of feedback should experience less negative affect if the feedback is framed in a manner that focuses them selectively on those who performed worse than themselves.

The findings of Study 2 indicated that negatively oriented persons reacted positively when they were encouraged to focus downward and that positively oriented persons reacted negatively when they were encouraged to focus upward. This pattern of effects may not be inevitable, however. In recent years, various authors have suggested that comparisons in either direction may have both positive and negative consequences and that individuals' interpretations of comparative feedback may be critical in determining the particular reaction they experience (Aspinwall & Taylor, 1993; Major et al., 1991). Furthermore, some researchers have proposed that negatively oriented people may be more likely than their counterparts to interpret comparative feedback negatively (Buunk, Collins, Taylor, Van Yperen, & Dakof, 1990; Hemphill & Lehman, 1991; Wheeler & Miyake, 1992). A recent study by Buunk et al. (1990) offers support for these propositions. These researchers asked their subjects to report the frequency with which they had experienced negative reactions in response to comparisons with better-off others (i.e., upward comparisons) and worse-off others (i.e., downward comparisons). The results indicated that subjects with low self-esteem reported a higher frequency of negative reactions to both upward and downward comparisons than did those with high self-esteem. The authors suggested that these effects occurred because people with low self-esteem were more likely than those with high self-esteem to interpret any particular comparison experience (be it upward or downward) in a negative light. Additional research is needed to clarify the precise manner in which individuals' orientations influence their reactions to upward and downward comparisons.

**Deficiencies in Statistical Reasoning**

The findings regarding comparison group size have implications regarding laypersons' abilities to make appropriate use of statistical rules. The results revealed two deficiencies in statistical reasoning. First, subjects failed to recognize that relative performance feedback based on a larger sample provided a better assessment of their relative ability level than feedback based on a smaller sample. This error was revealed in two ways: (a) Subjects' ratings of the reliability and validity of the feedback were comparable across variations in group size, and (b) there was no interaction between comparison group size and positivity of feedback on judgments of ability. These results are consistent with previous research showing that people are able to make use of the "law of large numbers" under only very limited circumstances (Fong, Krantz, & Nisbett, 1986; Kunda & Nisbett, 1986; Nisbett, Fong, Lehman, & Cheng, 1987; Nisbett & Ross, 1980). Much of this previous research used a scenario paradigm to explore subjects' reasoning. The present studies show that the results obtained in the scenario studies generalize to realistic performance feedback situations.

The second deficiency in reasoning involved focusing on absolute numbers or frequencies rather than proportions or rates when evaluating information derived from distributions of different sizes. Again, these findings replicate the results of previous research (Miller, Turnbull, & McFarland, 1989; Silka & Albright, 1983). The current studies offer evidence of this same error in a new context: people's evaluations of relative performance feedback. Individuals' reactions became polarized with increases in sample size because they focused on the absolute number of people who did better or worse than them. Presumably, if they had calculated their percentile standing (i.e., the most appropriate way to evaluate the feedback) these effects would not have occurred.

It is noteworthy that the deficiencies in statistical reasoning described above were observed in both positively and negatively oriented persons. These results are interesting in light of recent work on the "depressive realism" hypothesis which asserts that depressives make more accurate social judgments than nondepressives (for reviews see Ackerman & DeRubeis, 1991; Alloy & Abramson, 1988). The present findings suggest that individuals with negative orientations are no more accurate in dealing with self-relevant statistical information than those with positive orientations.

**Conclusion**

In closing, it is worth noting the contribution that the current research makes to the extant literature on the social comparison of abilities. Over the years, various authors have observed that much of the research on social comparison has focused on identifying the factors that influence individuals' selections of comparison targets (Ahrens, 1991; Goethals, 1986; Mettee & Riskind, 1974; Suls, 1986; Wheeler, 1986; Wood, 1989). They have recommended that researchers turn their attention to a relatively neglected topic area: how people respond to comparison information that is not selected
by them but that impinges on them. The present studies attest to the value of that advice and suggest that the investigation of the social comparison process could benefit significantly from the study of people's reactions to distributional as well as individual comparative information.

References


pound even if you don't learn to swim as well? (Journal of Personality and Social Psychology, 47, 213—231.)


Parducci, A. (1968). The relativity of absolute judgments. (Scientific American, 219, 84—90.)


Various dimensions reflect individuals' tendencies to approach life with a positive or negative "set." Included among these would be high versus low self-esteem, positive versus negative self-schemas, high versus low subjective well-being, negative versus positive affectivity, optimism versus pessimism, depression versus nondepression, and optimistic versus pessimistic attributional style. In this article, the general term orientation is used because the two measures selected for study (the Beck Depression Inventory and Scheier and Carver's Life Orientation Test) may incorporate a variety of these dimensions. For example, depressed or pessimistic individuals may differ from their counterparts in terms of affect, self-constructs, and expectancies regarding life outcomes (Alloy & Ahrens, 1987; Dunning & Story, 1991; Gotlib & McCann, 1984; Marshall, Wortman, Kusulas, Hervig, & Vickers, 1992; Pyszczynski, Holt, & Greenberg, 1987; Scheier & Carver, 1985; Watson & Clark, 1984).

The use of a combined index can be justified on both theoretical and empirical grounds. From a conceptual standpoint, many theorists consider pessimistic expectancies for the future to be a central feature of depression (e.g., Abramson, Metalsky, & Alloy, 1989; Andersen, Speilman, & Bargh, 1992; Beck, 1987). From an empirical standpoint, numerous studies have revealed that dysphorics possess more negative expectancies than nondysphorics (Alloy & Ahrens, 1987; Andersen et al., 1992; Dunning & Story, 1991; Pyszczynski et al., 1987). In addition, the LOT has been found to correlate highly with measures of depression (Marshall & Lang, 1990; Scheier & Carver, 1985). Finally, research investigating the relations of the BDI and the LOT with other variables suggests that both depression and optimism might best be conceptualized as components of a higher order construct such as negative affectivity (Watson & Clark, 1984, 1992). Recent studies indicate that items from the BDI and the LOT correlate highly with measures of negative
Analyses of the individual items comprising the social perceptiveness index revealed effects similar to those obtained on the overall index. The untransformed means for the negative feedback conditions on each of the three dependent measures (presented consecutively) were the following: positive orientation/small sample $M$s = 6.1, 5.9, and 4.5; positive orientation/large sample $M$s = 6.6, 6.6, and 4.9; negative orientation/small sample $M$s = 5.9, 6.0, and 4.6; and negative orientation/large sample $M$s = 4.9, 4.8, and 4.0. The corresponding means for the positive feedback conditions were the following: positive orientation/small sample $M$s = 7.3, 7.1, and 5.3; positive orientation/large sample $M$s = 7.2, 6.8, and 5.1; negative orientation/small sample $M$s = 6.8, 6.4, and 4.8; and negative orientation/large sample $M$s = 6.2, 6.3, and 5.0. Preliminary analyses of both studies yielded no effects for sex of subject, and the analyses were collapsed across this variable. In addition, in both studies separate analyses using depression levels and optimism levels as independent variables were conducted. These analyses revealed patterns of effects similar to those obtained with the orientation index. However, the majority of these effects were marginally significant. Apparently, a measure of orientation that incorporates a balanced mix of items reflecting both negative affect (i.e., the BDI) and negative expectancies (i.e., the LOT) serves as a somewhat better predictor of subjects' reactions to relative feedback than does a measure based on either affect or expectancies. Finally, preliminary analyses of Study 1 revealed no effects for version of feedback (positive vs. negative relation between arousal and social perceptiveness ability), and the analyses were collapsed across this variable.

The degrees of freedom were calculated using the Satterthwaite method recommended by Howell (1987).

Table 1.


Table 2.


Table 3.


Table 4.