# COGNITIVE DISTORTION OF SOCIAL FEEDBACK IN DEPRESSION

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This research tested hypotheses derived from Beck's theory of depression by examining cognitive distortion in the context of a personally relevant social situation. Mildly depressed and nondepressed subjects were each paired with nondepressed partners. Subjects were randomly assigned to either 30% or 70% positive-feedback conditions. After first recording their thoughts in anticipation of the interaction, subjects were told to interact with their partner and were given feedback on their social skills. They rated their feedback at three separate times during the conversation and later were asked to recall how many positive-feedback statements they received. Results partially supported the predictions from Beck's model. As predicted, mildly depressed subjects initially perceived feedback no differently from nondepressed subjects, yet recalled less positive feedback when it was presented at a high rate. Although no differences were found between depressed and nondepressed subjects' thoughts before the interaction, depressed persons did report more negative automatic thoughts on a structured questionnaire after the interaction. The findings have implications for cognitive theory and treatment of depression.

Recent developments in the study of behavior change have brought increased attention to the role of cognition—that is, the way an individual perceives, construes, anticipates, and evaluates events, behaviors, and their consequences (Bandura, 1977; Mischel, 1973). Research on depression has moved in a similar direction, and the work of Beck, in particular, has been translated extensively into clinical interventions (Beck, Rush, Shaw, & Emery, 1979).

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According to Beck (1976), an individual's negatively toned, rigid cognitive schemas are activated by loss or other environmental stressors, leading to a construal of the situation as hopeless and a focus on feelings of self-doubt and worthlessness. He hypothesizes that the depressed person perpetuates this negative view by selective attention to negative information, to the relative exclusion of positive experience, and by distortion of positive environmental feedback that is inconsistent with the negative view of the self.

Research has shown that depressed persons systematically distort positive feedback on laboratory achievement tasks. For example, Wener and Rehm (1975) found that mildly depressed students recalled receiving less positive feedback than nondepressed individuals on a pseudosocial intelligence task. Gotlib (1981) found that hospitalized depressed patients recalled giving themselves fewer positive reinforcements and more punishments than was actually the case on a verbal-recognition task. Johnson, Petzel, Hartney, and Morgan (1983) found that depressed college students recalled more failed (uncompleted) pencil-and-paper tasks than completed tasks, and depressed persons recalled more failures than did nondepressed students. Nelson and Craighead (1977), using an ambiguous laboratory word-recognition task, found that mildly depressed college students recalled less positive and more negative feedback than nondepressed subjects.

In addition, DeMonbreun and Craighead (1977) found that clinically depressed subjects did not differ from nondepressed subjects in their immediate perceptions of feedback. They did differ in *recall* of positive feedback, however, especially if such positive feedback occurred at a high rate. Finkel, Glass, and Merluzzi (1982) assessed depressed persons' immediate perceptions and recall of positive and negative selfreferent statements. As in the study by DeMonbreun and Craighead, mildly depressed persons, relative to nondepressed persons, underestimated the number of positive self-statements when they occurred at a high but not a low rate. Unlike previous research, however, differences were also found in immediate perceptions of the statements.

There are two classes of situations in which personal feedback is important and apt to be distorted by depressed persons: achievement and social situations. Most of the previously cited research has dealt with achievement situations. The present study draws upon findings and experimental paradigms used by Craighead to test Beck's cognitivedistortion hypothesis in a social setting with feedback about important real-life social behavior.

We predicted that mildly depressed subjects would differ from nondepressed individuals on recall but not on the initial perception of feedback about their social skills, and would recall having received less positive feedback only when it had been presented at a high rate. It was also anticipated that depressed subjects would report more negative self-statements in anticipation of a social interaction and a greater frequency of automatic negative thoughts.

# METHOD

### SUBJECTS AND DESIGN

Subjects were 102 undergraduate students, 38 men and 74 women, who volunteered to participate in the study for extra credit as part of their introductory psychology classes. Four to seven weeks before the experimental sessions, each subject completed the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and a short form of the Minnesota Multiphasic Personality Inventory (MMPI) depression scale, the D-30 (Dempsey, 1964). The depression scores were converted to standard scores and averaged. Convergent measures were used because Hammen (1980) has found BDI scores in college students to be unstable over a 3-week period. The test-retest reliability of the D-30 is superior to that of the BDI and is reported to range from .88 to .92 over a 3-day to 3-week period (Dempsey, 1964; Hatzenbuehler, Parpal, & Matthews, 1983). To verify the stability of depression level over the time between the prescreening and the experiment, the Multiple Affect Adjective Check List, "today" form (MAACL; Zuckerman & Lubin, 1965) was used to assess depression levels at the experimental session.

Subjects were assigned to one of three groups on the basis of their depression scores. The depressed group (n=25) met the following criteria: (1) BDI score greater than or equal to 10; (2) D-30 score greater than or equal to 11; and (3) averaged scores in the top quartile. The nondepressed group (n=26) had (1) BDI scores less than or equal to 4; (2) D-30 scores less than or equal to 5; and (3) averaged scores in the bottom quartile. Partners (n=51) did not meet the criteria for inclusion in either group, and were randomly assigned to interact with either a depressed or a nondepressed subject who was not known to them.

Subjects in the depressed and nondepressed groups were then randomly assigned by gender to one of two conditions: 70% or 30% positive feedback about social skills. Those in the high-positive-feedback condition thus received 21 positive, 6 neutral, and 3 negative feedback statements. Subjects in the low-positive-feedback condition were given 9 positive, 6 neutral, and 15 negative statements.

## FEEDBACK

Verbal feedback statements about positive and negative attributes related to social competence generated by pilot subjects were rated by other pilot subjects on a 5-point scale from ''very negative'' to ''very positive.'' Statements were selected for use in the study if they were plausible as feedback in the interaction, and if there was a high degree of agreement as to their subjective value. Positive statements, such as ''You show respect for the other person,'' had average pretest ratings ranging from 4.0 to 4.9. Negative statements, such as ''You are acting slightly superior,'' ranged from 1.7 to 2.0. Finally, neutral feedback had average pretest ratings from 2.9 to 3.3; for example, ''You have a look in your eye.''

## PROCEDURE AND MEASURES

Each subject-partner pair was told the following: (1) The experiment concerned social skills in the acquaintanceship process; (2) their task was to engage each other in social conversation in order to get acquainted; (3) they would be observed through a one-way mirror by a psychologist who would give them feedback at some point about their social skills in the interaction; (4) at several points during the conversation a "Stop-Action" would be called, and they would go to separate rooms either to receive feedback or to fill out questionnaires; (5) they could talk about anything they wished except the experiment; and (6) the conversations would last a total of about 10 minutes. The experimenter was an undergraduate psychology major, blind to subjects' level of depression.

Pairs were then separated for 3 minutes and told to wait quietly while the experimenter retrieved a questionnaire. Subjects were then asked to fill out the "prediscussion questionnaire." They were given 3 minutes to list their thoughts (Cacioppo, Glass, & Merluzzi, 1979; Cacioppo & Petty, 1981). Two graduate students later scored the thoughts for their *valence* (affective tone positive, neutral, or negative) and *focus* (concerning the self, the partner, the study, irrelevant, or incomplete). Interrater reliability was 91% for valence and 96% for focus.

The experimenter introduced the partners to the subjects and left the room. After 3 minutes of conversation, the experimenter called a "Stop-Action" and separated the pairs. Subjects were given 10 handwritten verbal feedback statements and told that these were the observer's feedback. To assess immediate perception of feedback, they were instructed to rate each statement on a 5-point scale from negative to positive. Partners were given a ''dummy'' task.

When subjects had completed their ratings, pairs were brought together again and instructed to resume conversation. This procedure was repeated two more times. After the third "Stop-Action" and feedback rating, subjects and partners completed a recall measure. They were asked to think back over the feedback statements they had seen and recall how many of the 30 feedback statements they had rated were to any degree positive. They also completed the MAACL and Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) at this time. This latter scale has been found to discriminate depressed and nondepressed persons, and was included as an additional cognitive measure.

To counteract for any possible detrimental effects of negative feedback, subjects in the 30%-positive-feedback condition then conversed for another 3 minutes and received positive-feedback statements at their final "Stop-Action." Subjects and partners were debriefed together. The deception about the feedback was explained, and questions were answered. Subjects were given the choice of withdrawing their data without loss of credit, or giving consent for its use in the study. No subjects refused consent.

## RESULTS

#### LEVEL OF DEPRESSION AND GENDER DIFFERENCES

Since there were no main effects or interactions for gender, this factor was excluded from further analyses. Separate  $2 \times 4$  analyses of variance (ANOVAs) with independent variables of feedback condition (30% vs. 70% positive feedback) and group membership (depressed, nondepressed, partner of depressed, and partner of nondepressed) were conducted for the three initial measures of depression: BDI, D-30, and averaged *z* scores. The analyses indicated only main effects for group, *F*'s (3, 96)=69.9, 69.16, and 116.76, respectively, *p*'s < .001. Newman-Keuls post hoc comparisons revealed that the depressed group was significantly more depressed on both measures of depression than the nondepressed group (p < .05). The partners did not differ from the nondepressed group. The BDI scores of the depressed group (M=14.8) fell into the mildly depressed range, as defined by Beck *et al.* (1961). The average D-30 score for the depressed group was 13.44, which is elevated above the normal range and equivalent to an MMPI

*T* score of 68 (Dempsey, 1964). All other subjects' BDI and D-30 scores fell in the nondepressed range.

A separate 2×2 ANOVA on the MAACL depression scores at the time of the interaction revealed that depressed subjects reported higher levels of depression, F(1, 47) = 7.10, p < .001, than did nondepressed subjects.

## COGNITIVE MEASURES

Because the total number of listed thoughts varied greatly, from 0 to 10, the proportion of each category of thoughts relative to total thoughts was used for the analysis, after performing arc-sine transformations to obtain equal variance (Neter & Wasserman, 1974). Contrary to prediction, *t* tests yielded no significant difference between depressed and nondepressed groups on either negative thoughts or negative thoughts about the self. A 2×2 ANOVA on ATQ scores yielded the predicted main effect for depression level, however, *F* (1, 47)=53.24, *p*<.001. Depressed subjects reported significantly more automatic negative thoughts on the ATQ than did nondepressed subjects. The relationship between the ATQ and the depression measures were similar to those reported by Hollon and Kendall (1980) and Dobson and Breiter (1983), *r*'s = .47–.57, *p*<.001.

## IMMEDIATE PERCEPTION OF FEEDBACK

Subjects' feedback ratings were analyzed by  $2 \times 2$  ANOVAs. For average ratings of positive and negative feedback, no significant main effects or interactions were found. As predicted, depressed subjects considered the feedback with predetermined positive values to be just as positive as the nondepressed subjects did, and the context of receiving either 70% or 30% positive-feedback statements made no difference. Means and standard deviations for immediate perception of feedback and recall of feedback are presented in Table 1.

The ANOVA for average ratings of neutral-feedback statements yielded no significant main effects for depression level or feedback condition, but the interaction was significant, F(1, 47) = 10.31, p < .002. Newman-Keuls tests indicated that nondepressed subjects in the 30%-positive-feedback condition rated the neutral feedback significantly more negatively than either the depressed subjects in the 30%-positive condition or the nondepressed subjects in the 70%-positive condition.

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| VARIABLE                                 | DEPRESSED |       | NONDEPRESSED |      |
|--|-----------|-------|--------------|------|
|  | М         | SD    | М            | SD   |
| Depression scores                        |           |       |              |      |
| BDI                                      | 14.80     | 5.03  | 2.08         | 1.29 |
| D-30                                     | 13.44     | 3.57  | 3.19         | 1.44 |
| MAACL                                    | 12.60     | 6.57  | 7.91         | 4.52 |
| Cognitive responses                      |           |       |              |      |
| Negative thoughts <sup>a</sup>           | 0.10      | 0.49  | 0.17         | 0.44 |
| Negative thoughts—self <sup>#</sup>      | 0.29      | 1,56  | 0.25         | 1.28 |
| ATQ                                      | 64.08     | 13.87 | 42.38        | 5.79 |
| Immediate feedback ratings               |           |       |              |      |
| Positive feedback                        |           |       |              |      |
| 70%-positive condition                   | 4.10      | 0.66  | 4.51         | 0.48 |
| 30%-positive condition                   | 4.48      | 0.47  | 4.49         | 0.34 |
| Neutral feedback                         |           |       |              |      |
| 70%-positive condition                   | 3.35      | 0.75  | 3.60         | 0.58 |
| 30%-positive condition                   | 3.79      | 0.50  | 3.05         | 0.28 |
| Negative feedback                        |           |       |              |      |
| 70%-positive condition                   | 2.54      | 0.63  | 2.49         | 0.54 |
| 30%-positive condition                   | 2.15      | 0.45  | 2.07         | 0.53 |
| Recall of positive feedback <sup>h</sup> |           |       |              |      |
| 70%-positive condition                   | 18.92     | 8.37  | 24.46        | 2.90 |
| 30%-positive condition                   | 15.67     | 5.93  | 11.15        | 4.49 |

TABLE 1 Means and Standard Deviations for Depressed and Nondepressed Subjects

"Proportional data.

<sup>b</sup>Estimated number of positive-feedback statements received.

#### **RECALL OF POSITIVE FEEDBACK**

A 2×2 ANOVA yielded a significant main effect for feedback condition, F(1, 47) = 26.80, p < .001, and a significant interaction, F(1, 47) = 9.62, p < .003. As predicted, Newman–Keuls comparisons revealed that depressed subjects' recall of positive feedback differed from that of the nondepressed group in the 70%-positive condition, but not in the 30%-positive condition (p < .05).

## DISCUSSION

Although research evidence is quite consistent in finding an association between negative cognition and depression (e.g., Krantz & Hammen, 1979; Nelson, 1977), the present study failed to find differences between listed thoughts of depressed and nondepressed subjects in anticipation of the interaction. Our procedure for scoring negative thoughts based on affective tone (valence) does not assess distortion in the thoughts, however. The thought-listing technique, which requires spontaneous recall of cognition, also differs in methodology from structured questionnaire measures.

When a more structured assessment was employed, we found higher levels of automatic thoughts on the ATQ from depressed subjects compared to nondepressed, in support of Beck's (1976) contention that depression is associated with certain types of negative thinking. The ATQ, by its very design, contains only thoughts associated with depression that are both negative and irrational or distorted (Hollon & Kendall, 1980). The significant correlation over time found between ATQ scores and depression also adds to the evidence for the validity of the ATQ.

An interesting and unpredicted pattern of results showed nondepressed subjects rating the neutral statements more positively in the 70%-positive than in the 30%-positive condition, while the rating of the depressed subjects did not differ across conditions. This pattern also held for subjects' recall of positive feedback, where nondepressed persons, but not depressed persons, recalled significantly more positive feedback in the 70%-positive than in the 30%-positive condition. This may represent a greater sensitivity of nondepressed persons to the overall situational context. When they received a high degree of positive feedback, they may have thus been influenced by the positive context of the situation to view even the more ambiguous neutral statements in a more positive light. Assisting depressed individuals in developing the ability to attend to and accurately use environmental cues to lend meaning to otherwise ambiguous circumstances may be a productive target for therapeutic intervention.

Perhaps the most important findings of the study were obtained on measures of the initial perception and subsequent recall of social feedback. As predicted, no group differences existed in immediate perception of positive-, negative-, or neutral-feedback statements. Yet, depressed subjects distorted by *recalling* significantly less positive feedback than nondepressed subjects, when such feedback was presented at a high rate discrepant from their apparently negative self-schemas. When low amounts of positive feedback were presented, the two groups

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did not differ significantly in their recall, although depressed subjects recalled slightly more positive feedback than nondepressed persons. This unexpected finding, although not significant, underscores the need for further research relevant to Beck's cognitive theory of depression. Also, since recall was assessed only for positive statements, the present study cannot rule out the possibility that this recall deficit might also extend to neutral and negative feedback and be indicative of an overall attentional or memory deficit. However, this would seem unlikely, because previous research (e.g., Gotlib, 1981; Johnson *et al.*, 1983; Nelson & Craighead, 1977) suggests that depressed subjects attend to and remember more, rather than less, affectively negative material.

The findings of the present study replicate even more strikingly the results of DeMonbreun and Craighead (1977), because the interaction effect in the present study was significant, and it was not in the former study. The present study has also extended the generalizability of these results to a more relevant social situation and to a mildly depressed, nonclinical sample. Thus, the study reveals important differences in the way depressed persons interpret social feedback, and suggests that depressed persons may not be remembering and reporting highly positive social experiences.

It is likely that correction of these distortions through cognitive therapy (e.g., Beck *et al.*, 1979) could do much to improve the social functioning of depressed persons. A second strategy would be to use self-monitoring techniques that allow for the immediate recording of positive events, to prevent cognitive processes from distorting the feedback (DeMonbreun & Craighead, 1977). By comparing the immediate recordings with distorted memories, depressed persons could be taught to readjust or correct their interpretations of events to be more consistent with reality, or even to overinterpret feedback as positive in a selfenhancing way, as many nondepressed people appear to do (Lewinsohn, Mischel, Chaplin, & Barton, 1980). It may be that the ability to integrate very positive feedback is a critical cognitive deficit in depression, and that a focus on cognitions about very positive social feedback or experiences might be an important target for therapeutic attention.

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