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## The induction of anger and its effects on self-criticism among depressed and non-depressed female college students.

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THE INDUCTION OF ANGER AND ITS EFFECTS ON  
SELF-CRITICISM AMONG DEPRESSED AND  
NON-DEPRESSED FEMALE COLLEGE STUDENTS

A Thesis Presented

By

WILLIAM E. HALEY

Submitted to the Graduate School of the  
University of Massachusetts in partial fulfillment  
of the requirements for the degree of

MASTER OF SCIENCE

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Psychology

THE INDUCTION OF ANGER AND ITS EFFECTS ON  
SELF-CRITICISM AMONG DEPRESSED AND  
NON-DEPRESSED FEMALE COLLEGE STUDENTS

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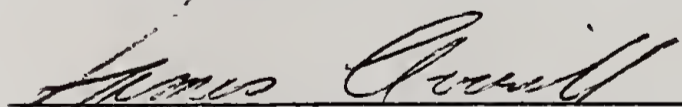
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## ABSTRACT

This study was an investigation of the relationship between anger, self-criticism and depression. The research evaluated predictions derived from a psychoanalytic theory of depression, which views depression as a form of internalized anger, and other theories which postulate that self-criticism is a general cognitive style of depressives.

Subjects were 41 female college students, who had been selected from a pool of 199 women who completed a modified version of the Zung Self-Report Depression Inventory. Depressed and nondepressed subjects were selected from the top and bottom 25 percent of the distribution respectively, and were asked to participate in the study, under the cover story that the research was on problem solving behavior. Subjects were assigned to one of two conditions, and were run individually with a confederate. Subjects in the experimental group were angered by the confederate during a version of the Prisoner's Dilemma Game, in which the confederate promised to cooperate but actually double-crossed the subject. Control subjects worked on a different task, in which the confederate did cooperate fully with them. Thus, the study had a 2 x 2 design, with level of subject depression crossed with the two experimental conditions.

All subjects were then evaluated for their degree of self-criticism on three measures: negative and positive traits they marked as descriptive of them, and level of self-reward for their performance on a block design task.

No difference between groups was found on the measure of positive

traits endorsed, but depressed subjects marked significantly more negative traits as indicative of them. On the self-reward measure, depressed subjects in the anger condition were more self-critical than the other three groups. The results provide limited support for the psychoanalytic model of depression being related to internalized anger, but a cognitive explanation of the results is discussed.

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## C H A P T E R I

### INTRODUCTION

In recent years, psychologists and mental health workers appear to have a heightened interest in the study of the etiology, maintaining factors, and treatment of depression (Blaney, 1977). Depression appears to be one of the most widespread forms of psychopathology in the United States, with estimates that perhaps as many as 3-4% of Americans show indications of clinical depression (Lehman, 1971; Becker, 1974). Klerman and Barrett (1973) have estimated that the chance that a person will become clinically depressed in his/her lifetime is about one in ten, and that the chances are even greater among women. Many more Americans who might not be called clinically depressed suffer from depressed moods that are quite similar to more severe forms of affective disorder (Wessman and Ricks, 1966). In addition to the distress and discomfort which occur for the depressed and their families (Knauth, 1977), depression is one of the few emotional disorders which is life-threatening. Suicide is a major health problem in this country, and is the second leading cause of death among college students (Schuyler and Katz, 1973). It has been estimated that the national suicide rate is about 15 per 100,000 (Schuyler and Katz, 1973), and that 2 million living Americans have attempted suicide (Strickland, 1977a). Even among "normal" college students the incidence of depression and suicidal ideation is quite high (Crepeau, Note 1). In a recent study investigators found that 75% of a college student sample experienced at least mild depression, and 41% experienced moderate or severe depression, during their freshman year of

college (Bosse, Croghan, Greenstein, Katz, Oliver, Powell, and Smith, 1975). People who are diagnosed as depressed are at a far higher risk of death by suicide than the general population. Individuals who are manic-depressive may have a suicide rate as high as 14% (Robins, Murphy, Wilkinson, Gassner, and Kayes, 1959). Thus, depression is a serious social and personal problem with far-reaching effects on our society.

A number of factors are involved in the assessment of depression by clinicians and researchers. Major indicators include: sad moods; desire to avoid contact with others; loss of sleep, appetite, and sexual desire; negative self-concept; change in activity level to agitation or lethargy; and feelings of helplessness and hopelessness (Beck, 1967; Becker, 1974; Strickland, 1977a). These disturbances may be present in varying degrees in different cases; for example, in "masked depression" there may be no outward indication of mood disturbance. This lack of reliable, objective criteria has led to considerable variations between clinicians in their assessment of depression. Some behavior therapists (Wolpe, 1971) are likely to see indications of depression as secondary to the problem of anxiety, and patterns of diagnosis of depression have been shown to differ greatly between the United States and Great Britain (Zubin and Fleiss, 1971). Distinguishing between psychotic depression and schizophrenia can be especially problematic, as severe depression can be accompanied by marked thought disorder and delusions (Beck, 1967).

Of course, depressives are not a homogeneous group. There appears to be a number of important dimensions of depression, including unipolar/bipolar, reactive/endogenous, and neurotic/psychotic. It seems likely

that these dimensions differ in regard to genetic, biochemical, and environmental influences in their etiology (Beck, 1974; Depue, 1977).

A number of physiological and psychological theories attempt to account for the etiology and maintenance of depression. Extensive reviews of these theories may be found in a number of excellent works (Depue, 1977; Becker, 1974; Friedman and Katz, 1974), and is beyond the scope of this paper. This paper will review a topic which is addressed from several theoretical approaches: the role of self-criticism in depression. The phenomenon of self-criticism is of special interest because it potentially provides a link between cognitive, behavioral and psychoanalytic theories of depression.

## C H A P T E R   I I

### LITERATURE REVIEW

Self-criticism in depression has been studied from four major perspectives: psychoanalytic, cognitive, cognitive-behavioral, and interpersonal. These theories, and the data supporting them, are outlined below.

Psychoanalytic theorists noted the self-punitive aspects of depression in their early writings, and viewed this phenomenon as an internalization of unexpressed aggressive impulses. Abraham (1911, 1916) wrote that in depression, guilt from suppressed impulses of hatred and revenge was introjected against the self. Freud (1917) saw depression as a response to a real or symbolic loss, and self-reproaches as a continuation of unconscious aggressive tendencies toward the lost love object. Freud believed that the ego of the depressive introjects and over-identifies with the love object, and rage at the real or symbolic desertion, is directed against the depressive's own ego. In addition, the depressive feels guilt, blaming him/herself for the loss of the love object.

Rado (1928) wrote that depressives were quite dependent on others, and "cling to their love-objects like leeches." In his model, the depressive has learned as a child that love and forgiveness follows a punishment from the parents. The depressive punishes him/herself, hoping to win love. Thus, unconsciously, "self-punishment has its origins in the longing for love" (Rado, 1928).

More recent psychoanalytic discussions of depression have placed

less emphasis on aggression against the self as a causal mechanism in depression. Bibring (1953) has written that depression is caused by a lack of self-esteem, and that a lack of narcissistic self-love may be more important in depression than self-punishment. Bonime (1966) has proposed that depression is a form of coercion: a "practice", not a disease. He writes that the depressive uses his/her sadness, self-criticism, etc., as "emotional blackmailing". While other psychoanalytic theorists have written that a lack of hostility is a feature of depression, Bonime considers depression as a way of expressing hostility, because the depressive makes him/herself so aversive to be around.

Theorists from orientations outside the psychoanalytic model have agreed that depression has a self-punitive aspect. Beck (1967, 1976) has proposed a cognitive theory which states that depression is due to a "cognitive triad": negative view of the self, world, and future. Beck believes that depressives often have negative cognitions about themselves, distorting reality and cognitively "punishing" themselves. Beck notes that depressives misinterpret reality, and find evidence for their lack of worth, through such processes as arbitrary inference, selective abstraction, overgeneralization, and minimization and magnification of information. For example, a depressive may receive a compliment, but explain it away by saying to himself, "s/he was only trying to cheer me up," or s/he may elaborately reinterpret minor negative comments as major insults. Thus, self-criticism is seen as a part of the depressives' style of processing information, and as a causal factor in depression.

Several theorists have construed self-criticism within a cognitive-

behavioral perspective, and hypothesized that depressives have low rates of self-reinforcement, and high rates of self-punishment (Kanfer, 1970; Bandura, 1971; Rehm, 1977). Rehm has further hypothesized that depressives' selective self-monitoring of negative events and immediate consequences, stringent self-evaluative criteria, and inaccurate attributions of responsibility are related to this difference in patterns of self-reward and self-punishment.

These theorists view self-reward and self-punishment as mechanisms of self-control. Thus, the individual's administration of self-reward is seen as maintaining behavior in the absence of external reinforcement, and self-punishment as lowering the probability of a response. High amounts of self-punishment and infrequent self-reward are hypothesized as leading to reduced activity levels and depression, in much the same way that Lewinsohn (1974) has argued that depression results from a lack of response-contingent reinforcement from the environment decreasing the amount of pleasant activity. Bandura (1971) and Nelson and Craighead (1977) have also construed self-reward and self-punishment as operational definitions of self-evaluation and self-esteem.

Interpersonal perspectives have stressed the role of self-criticism in gaining attention and sympathy from others. Ullmann and Krasner (1975), Forrest and Hokanson (1975), and Coyne (1976a,b) have all discussed the effects of depressives' self-criticisms on their environments. While Coyne's interpersonal theory stresses the ways in which depressives' behavior drives others away and decreases the likelihood of their gaining support, the other interpersonal theories mentioned point out the potential rewards that result to the depressive from his/her self-

reproaches.

A number of studies have been carried out in an attempt to ascertain if depressives are lacking in outward expression of aggression, and if depressed individuals are highly self-critical. The results have not supported the notion that depressives have a deficit in the expression of aggression. Becker (1974) has noted that, "Clinical evidence strongly suggests that a high proportion of filicides (child murders) and child battery are committed by depressed, hostile, irritable mothers"--hardly indicative of suppressed aggressive tendencies. Weissman, Klerman and Paykel (1971) interviewed 40 depressed women and a normal comparison group, and found that depressed women reported an increased amount of expressed hostility toward others, especially their spouses and children. However, the authors only measured self-report of hostility expressed, so it is difficult to know if behavioral differences occurred between their groups. Gershon, Cromer and Klerman (1968) found that there was no relationship between the amount of hostility found in speech samples of depressed patients and the severity of their depression. However, the small number of subjects used in this study, and the fact that only depressed subjects were tested minimize the usefulness of these data. Weissman, Ricks and Tyl (1960) studied mood fluctuations in college students, and found that subjects responded more extrapunitive on the Rosenzweig P-F test when they reported being depressed than when they were elated. A study by Friedman (1970) of 190 depressed patients and 98 nondepressed controls found that expressed and internalized anger, as measured by the Buss-Durkee Inventory, were not inversely related, and that depressives were more expressive of resentment and

hostility than controls. In addition, Friedman found that increased outward expression of hostility to others was negatively correlated with clinical improvement of depressives. Klerman and Gershon (1970) report that drug treatment with Imipramine caused improvement in depressive symptoms, but no change in outwardly directed hostility, contrary to their assessment of previous clinical observations. In a study by Koerner (Note 2), in which college students were frustrated by a confederate, depressed subjects became more hostile in mood and were more covertly aggressive toward the frustrator than nondepressed subjects, becoming more critical of their frustrator on a post-experiment questionnaire. No differences were found in the amount of overt aggression expressed, measured by the amount the subjects punished the confederate with poker chips on a "learning task".

Kendell (1970) has used a different method of testing the relationship of depression and the expression of aggression. Using actuarial, non-reactive forms of measurement, Kendell noted several interesting relationships between aggression and depression, including: suicide rates in a society are inversely related to homicide rates; suicides are more common in the upper classes, where norms against violence and aggression are strong, and homicides are more common in the lower classes; Hutterites, who have strong taboos against the expression of aggression, have high rates of depression; there is more depression among females than males. However, as Kendell notes, such correlational relationships may be due to other undetermined factors. For example, Hammen and Padesky (Note 3) have found that the commonly reported differences in numbers of male and female depressives may be due to such factors as

differing depressive symptoms among males and females, and hesitancy among males to seek help for depressive problems. Other data refuting Kendell's analysis include the strong evidence that males are more likely to successfully commit suicide than females (Schneidman and Farberow, 1970).

Epstein (Note 4), in his studies of subjects' everyday experiences of emotion, has found data which bears on the topic of anger and depression. He has found that, over a number of days, subjects who report feeling sad a good deal of the time also report high levels of anger. However, when correlations within particular days are examined, this relationship is not found. While the sadness of these subjects is not synonymous with depression, the data point out that the relationship of anger and depression may be a complex one, with average levels of depression and anger positively correlated, but anger being incompatible with depression at a given time. Such a relationship is also suggested by Novaco (1977), who reports the results of an anger-control treatment for a severely depressed patient.

Silverman (1976 a, b) has expressed the view that a test of psychoanalytic hypotheses must involve the study of unconscious, and not conscious, wishes of aggression. His position is that when hostile wishes become conscious, the defense of introjection need not take place. Silverman also criticizes the correlational approach of examining whether depressives are more hostile or aggressive than nondepressed individuals. He states that the psychoanalytic model posits that depressives are motivated by unconscious aggressive wishes, not that they are more hostile than normals. Silverman cites two unpublished

dissertations from his own laboratory, and a study by Rutstein and Goldberger (1973) in which the subliminal presentation of stimuli designed to arouse aggressive impulses increased subjects' ratings of their depressed mood. Presentation of the stimulus for a period long enough for conscious recognition of it failed to produce a mood change. However, Silverman (1976b) has reported another study that failed to replicate these findings.

While the evidence concerning depression and the expression of aggression is mixed, there is a body of data clearly indicating that depressives are highly self-critical. A number of studies by Beck and his associates (Beck and Hurvich, 1959; Beck and Ward, 1961; Beck, 1961) have determined that depressed patients have more masochistic dreams than nondepressed patients. In addition, Beck (1967) found, in an analysis of verbal samples of patients, self-criticisms were quite common among depressives. Gershon, Cromer, and Klerman (1968) studied that depression was positively related to ratings of the amount of self-criticism in their speech. Andur and Harrow (1972) found that their sample of depressed patients had stricter "consciences" than control patients, on a measure of severe superego, on the guilt scale of the Buss-Durkee Inventory, and on Mosher's morality-conscience guilt scale. Wessman and Ricks (1966) and Laxer (1964) have found that depressed subjects were more self-critical on Q-sort tasks than nondepressed subjects. Using psychiatric ratings and self-report, Harrow and Andur (1971) found that depressed patients had more negative self-concepts than non-depressed patients. Wessman, Ricks, and Tyl (1960)

followed a group of college women over time, and found that they were more self-critical on the Rosenzweig P-F test when in a depressed mood than in an elated mood. Fromm-Reichmann (1935) noted from her clinical experience that the common depressive symptoms of self-deprivation of sleep and nourishment are forms of self-punishment. From this perspective, some cases of suicide could be seen as extreme cases of self-punishment.

Rehm (1977) reports several unpublished studies that support the position that depressives give themselves lower amounts of self-reward and higher amounts of self-punishment than nondepressed individuals. Rozensky, Rehm, Pry, and Roth (Note 5) found that depressed Veteran's Administration patients were both more self-punitive and less self-rewarding than nondepressed patients. Roth, Rehm, and Rozensky (Note 6) found differences in the amount of self-punishment, although not self-reward, administered by depressed and nondepressed college students. Both studies used a paradigm in which subjects completed a word-recognition task, without external feedback, and self-reward and self-punishment were operationalized by counting the subjects' estimates of whether they were correct or not on each trial. Bandura (1971) and Nelson and Craighead (1977) have pointed out that a subject may think s/he has answered correctly, but may not think their effort was commendable. Thus, the judgement of correctness and a self-reward may be mediated by the subjects' standards for minimal achievement.

Nelson and Craighead (1977) told college students to reward themselves with 5¢ when they thought they had done a "good" job on a task,

and punish themselves with 5¢ when they thought they had made a "bad" response. They found that depressed subjects self-reinforced less than did nondepressed subjects, but found no differences in the amount of self-punishment. There were a number of flaws in their study, however. Data were not analyzed separately by sex, although Koerner (Note 2) found that female subjects were more self-punitive than males. An earlier manipulation of the study (external reward and punishment) produced a significant effect on both self-reward and self-punishment. In addition, the practice of using money as a self-reinforcer introduces the possible confound of individual subjects valuing the reward differently. It is interesting to note that depressed and nondepressed subjects in these studies did not perform significantly differently on the tasks they completed, but that their estimations of their performances were different.

The data mentioned above all suggest that depressives are generally self-critical and self-punitive. However, interactional theorists have described depressives' behavior as instrumental in nature, and thus varying across situations. Behavioral theorists such as Ullmann and Krasner (1975) and Ferster (1974) have stated that depressive behaviors such as self-criticism lead to environmental reinforcement. Several recent studies have examined interpersonal aspects of depression. Forrest and Hokanson (1975), in a study using electric shock between a confederate and a subject to elicit and measure aggression, allowed subjects to respond to aggression from the confederate with either shock to their opponent or to themselves. They found that depressed subjects were more likely to be self-punitive in response to such

aggression than nondepressed subjects, and that depressed subjects increased their self-punishment level even more when the pre-programmed responses of the confederate changed to a contingency in which such self-punishment led to avoidance of shock to the subject. Thus, depressed subjects were more likely to become self-punitive to avoid shock from their opponent. In addition, these researchers found that a self-punitive response to aggressive attack led to a rapid reduction in autonomic arousal only among depressed subjects, while nondepressed subjects showed similar arousal reduction only when following the aggressive attack with an aggressive counter-response.

Coyne (1976a, b) has stated that depressive behaviors are "powerful in the ability to arouse guilt in others, and to inhibit any direct expression of annoyance and hostility from others." His research has indicated that people who interact with depressives report feeling more guilty, anxious, and depressed themselves, and are less likely to want to interact with depressives than with other psychiatric patients.

Thus, self-punitive responses may be used by depressives to arouse guilt in others, and the depressive may have an expectancy that his/her response will reduce future punitive responses from others. Averill (1973) has also noted that the predictability which accompanies self-punishment may be quite helpful in regulating stress, and thus far preferable to an individual than unpredictable external punishment. The reduction in arousal found in the Forrest and Hokanson study indicates that self-punishment may not only lead to reinforcement from the environment, but also to a rewarding decrease in autonomic arousal during anger-arousing situations.

Although there seems to be widespread agreement that depressives are highly self-critical and self-punitive, the significance of self-reward and self-punishment is viewed differently from various theoretical perspectives. There are several senses in which self-criticism has been construed: as causal mechanisms, symptoms, and maintaining behaviors. Beck (1976), Bandura (1971), and Rehm (1977) all hypothesize that depressives are generally self-critical, and that this is a cause of low self-esteem and/or reduced behavioral output. Psychoanalytic theorists state that the self-punitiveness of the depressive is caused by unconscious aggressive wishes, and are symptoms of this underlying mechanism. Coyne (1976a, b) and Forrest and Hokanson (1975) note the role that these behaviors may have in eliciting sympathy, guilt, and in defending against external punishment. These theorists see self-critical behavior as leading to reinforcements that maintain the depression.

### C H A P T E R   I I I

#### STATEMENT OF THE PROBLEM

Results of previous research do not make clear what role self-criticism plays in depression. It may be that a number of these processes are important: self-criticism may (a) be initiated by unexpressed hostility, (b) punish potentially adaptive behavior and lead to lowered levels of activity and/or reduced self-esteem, and (c) lead to gains by reducing external punishment, eliciting support from others, and reducing autonomic arousal. These are complex questions, and the bulk of the information we have to answer them come from clinical observations and correlative research. Hopefully, the use of experimental approaches will allow us to deal with these questions carefully and accurately.

There have been few experimental efforts to test the psychoanalytic model of depression resulting from hostility turned against the self. The Silverman (1976a, b) studies cited above provide mixed support for the model, but the results have not been adequately replicated outside of the subliminal perception paradigm, or Silverman's own laboratory. Koerner (Note 2) attempted to induce hostile affect in depressed and nondepressed college students through insult, but the hostile affect he induced in his experimental group did not result in significant differences from those obtained in his control group. This may have occurred because his control subjects experienced frustration, by failing to do as well on the experimental task as the confederate. Frustration has been demonstrated to be a powerful instigation to aggression

(Geen, 1968; Gentry, 1970; Barker, Dembo, and Lewin, 1971; Miller and Bugelski, 1948).

The process of "hostility turned against the self," if it occurs, is also relatively unexplored. The research cited above seems to demonstrate that depressives are highly self-punitive and self-critical, but it is not clear if these behaviors are increased by unexpressed, "inwardly directed" hostility, correlated with mood changes, or unrelated to these variables.

The influence of the depressed individual's interaction with the environment on self-reward and self-punishment is also still unclear. Forrest and Hokanson (1975) did find that depressed subjects were more likely than nondepressed subjects to self-punish in an interpersonal situation in which attack could be expected from their frustrator. However, their use of an electric shock paradigm as analagous to social interaction seems quite unrepresentative of the types of self-punitive responses made by individuals in most interpersonal situations. In addition, it is unclear from their research whether it was the presence of the confederate which led to self-punishment among the depressives, in that no comparison was made with subjects who had received external attack but had no interaction with their frustrator.

The purpose of this study was to clarify the relationship between anger, self-criticism, and depression. The study attempted to ascertain: (a) if the induction of anger results in increased depressed mood and/or greater self-punitiveness among depressed individuals; and (b) if depressives are generally more self-punitive than nondepressed individuals.

A number of studies have demonstrated that frustration on a task, or personal insult, results in hostile affect in subjects (Geen, 1968; Gentry, 1970). However, these paradigms may also influence other variables which are related to self-criticism or depression. Both self-esteem and expectancy for success have been found to be related to depression (Beck, 1967; Coleman, 1975; Hale and Fibel, Note 7), and it is likely that both may be altered by failure on a task or personal insult. In this study, induction of anger was accomplished by means of an unjust betrayal of the subject by a confederate of the study, in hope that the effects of self-esteem and expectancy for success would be greatly lessened as mediators of mood and behavior change in the study. The method was adapted from the work of Conn and Crowne (1962) and Koerner (Note 2).

Specifically, the experiment was intended to test predictions derived from the psychoanalytic theory of depression against the cognitive and behavioral self-reinforcement models of depression. The hypotheses suggested by each theory are:

(1) The cognitive and behavioral self-reinforcement models propose that depressed individuals are generally more self-critical than non-depressed individuals. They make no predictions of this self-criticism occurring more frequently across situations.

(2) The psychoanalytic model also proposes that depressives are more self-critical than nondepressed individuals. However, the theory also suggests that unexpressed anger may be "turned in" by depressives, and be experienced as depression and self-criticism. Thus, the theory suggests that depressed individuals will become highly depressed in a

situation in which they are angered and do not express the anger: this process would be mediated by an increase in self-criticism.

Self-criticism was operationalized by three measures: one a measure of self-criticism on a task, the other two measures of positive and negative self-evaluation on subjects self-rating of their personalities.

Changes in depressed mood were also measured to test the psychoanalytic prediction of greater increase of depression for depressed subjects who were angered and unable to express this anger.

Interpersonal factors, which are likely to be quite important in self-criticism, were minimized and controlled by separating the subject and confederate during the assessment of self-evaluation.

## C H A P T E R IV

### METHOD

#### General Design

The study was a 2 X 2 between subjects design, with 2 levels of subject depression as one independent variable, and anger and control conditions as the other. The anger condition was similar to that used by Conn and Crowne (1962), in which the confederate promises to cooperate with but later double-crosses the subject on a Prisoners' dilemma task. Pilot data showed that subjects usually viewed the double cross as either an unjust attack or a selfish maneuver and perceived it as a strong anger-arousal stimulus. This manipulation has the added benefit of not confounding a direct self-esteem manipulation with the anger induction, as many studies using personal insult have in the past.

Control subjects worked on a cooperative task with the confederate.

#### Subjects

Subjects for the experiment were 54 female college students from introductory psychology classes at the University of Massachusetts/Amherst. Prior to and independent of the experiment, 199 female subjects had completed a modified version of the Zung Self-Rating Depression Scale (Zung, 1965) and several other questionnaires in groups of 10-20 students. Subjects volunteered to participate according to usual procedures. They had some choice of studies and received extra credit in their classes for their participation. Subjects for the experiment were drawn from the top and bottom 25% of the distribution of scores on

the Zung scale, with subjects in the depressed group having scores of 29 to 46, and subjects in the nondepressed group having scores from 16 to 2. For ethical reasons, subjects whose scores were extremely high (49 to 53) on the Zung scale were not used in the experiment, thus four highly depressed subjects were excluded from the sample. Depressed and nondepressed subjects were randomly assigned to anger and control conditions.

### Experimenters

The author, a male graduate student, was the experimenter, and two female undergraduate students served as confederates in the study. Experimental procedures were standardized and rehearsed to alleviate possible differences in the two confederates' behavior.

### Instruments

The Zung Self-Rating Depression Scale. This scale was used to designate depressed and nondepressed subjects. The scale has been shown to discriminate between depressed patients, psychiatric controls, and normals (Zung, 1956), and has been used in several studies to select depressed and nondepressed subjects from nonclinical populations (Hale, Note 8; Tennen, Note 9; Nugent, Note 10). The scale taps a number of dimensions of depression, including sad mood, loss of appetite, and lethargy. Scoring is objective, and is adapted to be relevant to a subclinical population, by adding the opportunity for subjects to respond "none of the time". Thus, scores are not directly comparable to

those reported by Zung (see Appendix A).

The Multiple Affect Adjective Checklist (MAACL). The MAACL measures affect states of anxiety, hostility, and depression. Split-half reliability on the scales range from .79 to .92 (Zuckerman, Lubin, Vogel, and Valerius, 1964). While the scales are often highly inter-correlated, there is some evidence for discriminant validity of the scales (Zuckerman, Lubin, Vogel, and Valerius, 1964; Zuckerman, Lubin, and Robins, 1965). Scoring is objective (Zuckerman, and Lubin, 1965), (see Appendix B).

The block design task. From the Weschler Adult Intelligence Scale (Wechsler, 1955), this task was used as a performance task to elicit opportunities for self-reward and self-punishment from subjects. Designs #2 and 3 were used by the experimenter to demonstrate the task, and designs #4-9 were administered to subjects. Performance was measured by recording the amount of time subjects took to complete each trial.

Plastic poker chips. These were used to measure self-reward and self-punishment during the block design task.

Playing cards. These cards were used to allow subjects to indicate their choices on the Prisoners' dilemma task. The subject and confederate each received a black and a red ace.

The object assembly task. From the Wechsler Adult Intelligence Scale, (WAIS) this task was used as a control task by subjects in the control

condition. Performance was measured by recording the amount of time subjects took to complete each trial.

The personality checklist. Assembled for the study from the Gough Adjective Checklist (1952) this scale consists of a list of 20 positive and 20 negative personality characteristics, which subjects endorsed as true or not true of them. Three graduate students rated the positive-negative valence of the adjectives to assure their validity in measuring self-criticism. The raters reached 100% agreement on the valence of the adjectives (see Appendix C).

The task questionnaire. This questionnaire was used to assess subjects' experience of the study (see Appendix D).

Post-experiment interview. An interview was conducted after the study, including several standard lines of questioning. In particular, subjects were asked about their thoughts about the confederate during the study when they were double-crossed; how they felt after having been double-crossed; and whether they believed that unexpressed anger was "turned against the self", either in themselves or people they knew. The occurrence of certain comments had been found to be frequent during pilot testing, so these were listed and rated for their occurrence in the interview following the experimental and control conditions (see Appendix E).

### Procedure

Subjects were contacted by telephone by the experimenter and asked

to participate in a study of "Individual differences in problem solving". They were told that the study would take about 45 minutes to complete, and that, to save time, subjects would be runs in pairs.

When the subject and confederate arrived for the study, the experimenter greeted them asked their names, and seated them across from each other at a table. The experimenter explained that the study would involve working on two problem-solving tasks, one a cooperative problem solving task and the other an individual problem-solving task. They were also told that the experimenter was interested not only in their actual performance on the task, but also in their reactions to and evaluations of the tasks. The subject and confederate were each given consent forms to read and sign (see Appendix F), and the experimenter excused himself to retrieve a stopwatch which he said he had left in another laboratory. The remainder of the experiment had two parts: the experimental manipulations, and the assessment of self-evaluation on an individual task. Anger and control subjects experienced different experimental conditions in the first part, but all subjects were treated the same during the second condition.

#### Experimental conditions.

Anger condition. Shortly after the experimenter left the room, (ostensibly to retrieve the stopwatch) the confederate said to the subject: "Hey, listen. A friend of mine was in this study and told me about it. We can win some money if we play it smart. Look at this chart (points to a chart on the wall showing Prisoners' dilemma contingencies). He's going to give us each a black and a red card, and ask us

to put one of them on the table. If we both play the red card all the way we can win \$12 apiece--\$3 a trial. It's easy money--we just play the red card each time--okay?" Thus, subjects were led to make a response which they believed to be of mutual benefit to themselves and the other "subject".

The experimenter then returned with his stopwatch, collected the consent forms, and explained that the first task would be a cooperative problem-solving task. The experimenter gave the confederate and subject each a red and a black playing card, and asked them to place them face-down on their laps. He then explained the contingencies of the task (see Table 1), a variant of the Prisoners' Dilemma Game (Deutsch, 1960) and told them he would ask them to choose a card to play on each of the four trials. He explained that no talking would be allowed between subjects for this part of the study, and told each of them to study the contingencies on the chart so that they could make their decisions. After asking them if there were any questions the experimenter asked the subject and confederate to place the card of their choice face-down on the table in front of them. The confederate always played the black card on all four trials. The experimenter then turned over the cards, and paid the subject and confederate according to the card the subject played. In every instance on the first trial the subject did play the red card, and the confederate, in spite of her previous agreement, played black. Thus, the confederate won \$5 and the subject nothing on the first trial. The experimenter's only comment was to state the amount of money that each had won on the trial while paying them in cash and asking them to play and retrieve their cards. This procedure

Table 1

Contingencies for the Prisoners' dilemma task.

Confederate choice.  
(But confederate  
always played  
black.)

Subject  
Choice.

	Red	Black
Red	Both win \$3.	Confederate wins \$5-- Subject wins nothing.
Black	Subject wins \$5-- Confederate wins nothing.	Both win 10¢.

was repeated four times. The experimenter then gathered up the cards, asked the subject and confederate to put away the money they had won, and gave each a MAACL to complete. The confederate won at least \$5 more than each subject so the maximum amount that any subject won was 30¢, while the confederate won anywhere from \$5.30 to \$20.

Control condition. Subjects in the control condition were also greeted and treated identically to subjects in the experimental condition, except for confederate response and the nature of the task. After seating the subject and confederate across from each other the experimenter left the room (again ostensibly for the stopwatch), and the confederate said, "Hey, listen. A friend of mine was in this study and told me about it. He's going to give us some puzzles to put together, and the first one is a hand."

When the experimenter returned, he collected the consent forms and stated that the first part of the study would be a cooperative problem-solving task. He told them that he would ask them to work together to assemble some puzzles as quickly as they could. They were told that they could not discuss the task while working on it. The experimenter then administered the object assembly task from the WAIS, timing the subject and confederate on all four trials as they completed the puzzles. The confederates subtly helped the subjects complete each of the four tasks in such manner that the subjects put about half of the parts together and completed the puzzles very rapidly. The experimenter complimented them on their performance, and repeated the procedure for all of the materials and gave the confederate and subject each a MAACL to complete.

Assessment of self-evaluation. All subjects then completed the second part of the study. The experimenter collected the MAACL that the subject and confederate had completed and explained that the next part of the study would involve each person working on an individual problem-solving task. The experimenter then led the confederate to an adjoining room, out of the sight of the subject, and told the confederate to work on several tasks while he worked with the other subject on a different task. The confederate had always taken the seat at the table nearest the door to the adjoining room at the beginning of the session, so the selection of the confederate to be the one to leave the room for this part would appear to be out of convenience.

The experimenter then returned to the subject and explained, "I am going to ask you to work on a block design task. I will show you a series of patterns on these cards (points) and your task will be to duplicate the patterns with these blocks (points) as quickly as you can while still doing the task accurately. Each block has two red sides, two white sides, and two sides that are half red and half white (shows her). I'll show you. Make sure you let me know when you're finished on each trial." The experimenter then demonstrated trials #2 and #3, saying "Done" when finished.

"Besides being interested in your performance on the task, I am also interested in your evaluation of your performance. After each trial, I will ask you to either reward or punish yourself according to how well you feel you did on that trial. You'll do this using these chips to reward yourself, and these to punish yourself. (The experimenter points to a center pile of colored chips, and then a pile of white

chips next to the subject.) If you feel that you have done extremely well on a trial--the very best possible--you can reward yourself with up to 10 chips for that trial. But if you feel you did extremely poorly on a trial--the very worst possible--you could punish yourself by taking away up to 10 chips from your pile and putting them in the center. So, if you feel you did well on a trial, you can reward yourself with up to 10 chips, and if you feel you did poorly punish yourself with up to 10 chips. Do you understand the way I want you to reward or punish yourself?"

After answering any questions, the experimenter then administered trials #4-9 of the block design task, timing the subject with a stopwatch. After the subject stated she was finished, the experimenter jumbled up the blocks, and asked the subject to evaluate her performance with the chips. No feedback was given to subjects about their performance. After the subject completed all 6 trials, the experimenter collected the materials, and asked the confederate if she had finished the tasks she was working on. He then gave the subject and confederate a second MAACL, a "Personality Checklist", and a "Task Questionnaire". After the subject finished the three questionnaires, the experimenter called the confederate in from the other room, debriefed the subject, and spent some time discussing the study with them. Subjects were also given a written feedback sheet (see Appendix G). After interviewing the subjects, the confederate and experimenter filled out a rating sheet listing the occurrence of certain comments (see Appendix E).

Subjects who reported on the "Task Questionnaire" that they felt

that the other "subject" was a confederate, or who stated in the debriefing that they were strongly suspicious of the study were dropped from the data analyses. Most of these subjects stated that they were sensitized to the use of deception in psychological research from their psychology courses, and that they were prepared to be deceived whenever they came to a study. Altogether, 13 subjects saw through the deception in the anger condition, 8 depressed and 5 nondepressed subjects. This left a total of 41 subjects, distributed evenly within the four groups but with one extra subject in the depressed control group.

## C H A P T E R V

### RESULTS

The dependent variables of the study were of four major types: mood data, task performance data, self-evaluation data, and interview data. Initial analyses were done on all measures to test for differences between the two confederates. Since no confederate effects were found, data from the two confederates were pooled for all subsequent analyses. All data were analyzed using a 2-factor analysis of variance (ANOVA), with level of subject depression (depressed/nondepressed) and experimental condition (anger/control) the independent variables.

Mood data. Mean scores and standard deviations of the three scales of the MAACL gathered immediately after the experimental manipulation are shown in Table 2. ANOVAs were computed on these scores. Significant main effects were found due to the anger manipulation for all three scales: anxiety ( $F=26.31$ ,  $p .001$ ), hostility ( $F=21.87$ ,  $p .001$ ), and depression ( $F=20.99$ ,  $p .001$ ). ANOVA tables for the anxiety, hostility and depression scores shown in tables 3, 4 and 5, respectively. Subjects in the anger condition showed increased anger, hostility and depression compared to the control subjects. There were no significant effects due to subject depression, or interaction of depression with condition.

Means and standard deviations for the MAACL data gathered after the block design task are shown in Table 6. ANOVA tests revealed no significant effects on any of the three measures, as shown in Tables 7, 8, and 9. The MAACL data demonstrated that the experimental manipu-

Table 2

Means and standard deviations of the initial MAACL scores.

	Depressed/ Anger Group (N=10)	Nondepressed/ Anger Group (N=10)	Depressed/ Controls (N=11)	Nondepressed/ Controls (N=10)
Anxiety	9.40 (1.95)	8.20 (1.81)	5.55 (2.16)	5.80 (1.87)
Hostility	13.50 (5.50)	10.50 (3.66)	6.45 (2.11)	7.20 (1.93)
Depression	19.80 (4.64)	19.40 (4.93)	12.73 (3.38)	15.00 (2.86)

Table 3

ANOVA table, first MAACL Anxiety measure.

Source of Variation	<u>DF</u>	<u>MS</u>	<u>F</u>	Signif. of <u>F</u>
Main Effects	2	51.350	13.3	.001
Condition	1	101.213	26.3	.001
Depression	1	2.127	.6	.462
2-Way Interactions		.		
Condition X Depression	1	5.412	1.4	.243
Residual	37	3.847		

Table 4

ANOVA table, first MAACL Hostility measure.

Source of Variation	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Signif. of F</u>
Main Effects	2	144.003	11.3	.001
Condition	1	278.574	21.9	.001
Depression	1	12.024	.9	.338
2-Way Interactions				
Condition X Depression	1	35.887	2.8	.102
Residual	37	12.739		

Table 5

ANOVA table, first MAACL Depression measure.

Source of variation	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Signif. of F</u>
Main Effects	2	176.258	10.883	.001
Condition	1	340.554	20.994	.001
Depression	1	9.582	.591	.447
2-Way Interactions				
Condition X Depression	1	18.274	1.127	.295
Residual	37	16.221		

Table 6

Means and standard deviations of the second MAACL scores.

	Depressed/ Anger Group (N=10)	Nondepressed/ Anger Group (N=10)	Depressed/ Controls (N=11)	Nondepressed/ Controls (N=10)
Anxiety	9.80 (3.08)	9.80 (2.74)	8.09 (2.59)	9.00 (1.63)
Hostility	10.70 (4.57)	11.10 (5.15)	9.27 (2.19)	10.60 (2.01)
Depression	19.50 (6.62)	19.30 (6.41)	15.64 (3.93)	18.80 (1.62)

Table 7

ANOVA table, second MAACL Anxiety score.

Source of Variation	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Signif. of F</u>
Main Effects				
Condition	1	16.386	2.48	.124
Depression	1	2.215	.34	.566
2-Way Interactions				
Condition X Depression	1	2.114	.32	.57
Residual	37	6.598		

Table 8

ANOVA table, second MAACL Hostility score.

Source of Variation	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Signif. of F</u>
Main Effects				
Condition	1	9.721	.70	.407
Depression	1	7.828	.56	.457
2-Way Interactions				
Condition X Depression	1	2.200	.16	.692
Residual	37	13.827		

Table 9

ANOVA table, second MAACL Depression score.

Source of Variation	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Signif. of F</u>
Main Effects				
Condition	1	50.500	1.98	.168
Depression	1	23.683	.93	.341
2-Way Interactions				
Condition X Depression	1	28.943	1.14	.293
Residual	37	25.480		

ation had a significant effect on initial mood. However, in considering the second set of MAACL scores, results suggest that the effect was short-lived, since no significant differences were found.

Task performance data. These data were examined to rule out any possible effects on subjects' self-evaluations due to differential performance on the tasks used. Means and standard deviations of the sum of the subjects' times on the 6 trials of the block design tasks are shown in Table 10. ANOVA computed on these scores revealed no significant effects, as shown in Table 11.

Depressed and nondepressed subjects' performance in the control condition on the object assembly task was computed by summing the time of the four trials on the task. Means and standard deviations of the data are shown in Table 12. No significant differences were found between the two groups in their performance on this task when a oneway ANOVA was calculated, as shown in Table 13.

While anger subjects did not work on the object assembly task, there were individual differences in the number of competitive cards that subjects played in the Prisoners' Dilemma Game. Since there were very small numbers of subjects per cell, no statistical comparisons were made, but inspection of the data (Table 14) seems to indicate that depressed subjects were more likely than nondepressed subjects to play the competitive response the maximum number of times.

Since it was noted by the experimenter that some subjects had shown severe performance deficits on the block design task, the number of subjects who failed to solve at least 4 of the 6 designs correctly

Table 10

Means and standard deviations of Time  
on Block Designs in Seconds.

	Depressed/ Anger Group (N=10)	Nondepressed/ Anger Group (N=10)	Depressed/ Controls (N=11)	Nondepressed/ Controls (N=10)
Time In Seconds	286.00 (132.13)	269.40 (84.04)	291.27 (59.91)	282.30 (49.95)

Table 11

ANOVA table, Time on Block Design tasks.

Source of Variation	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Signif. of F</u>
Main Effects				
Condition	1	828.857	.11	.741
Depression	1	1650.698	.22	.641
2-Way Interactions				
Condition X Depression	1	148.821	.02	.888
Residual	37	7448.235		

Table 12

Means and standard deviations, time on  
object assembly by control subjects.

	Depressed/ Controls (N=11)	Nondepressed/ Controls (N=10)
Time in Seconds	77.27 (12.95)	82.50 (8.55)

Table 13

ANOVA table, time on object assembly (control) task.

Source of Variation	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Signif. of F</u>
Between Groups	1	143.128	1.16	.294
Within Groups	19	122.983		

Table 14

Subject responses on the four trials of the  
Prisoners' dilemma task.

	No black cards. Sub- ject won nothing, confederate won \$20.	One black card. Sub- ject won 10¢ confederate won \$15.10.	Two black cards. Sub- ject won 20¢ confederate won \$10.20.	Three black cards. Sub- ject won 30¢, con- federate won \$5.30.
Depressed	0	1	3	6
Nondepressed	1	4	4	1

was tabulated. Once again, the numbers of subjects per cell was too small to make statistical comparisons, but from inspection of the data it appears that subjects in the anger condition were more likely to show such severe performance deficits (see Table 15).

Self-evaluation data. Means and standard deviations of the number of positive and negative adjectives marked on the "Personality Checklist" are shown in Table 16. As shown in Tables 17 and 18, ANOVAs failed to show any differences for positive adjectives, but depressed subjects checked more negative adjectives as indicative of their personalities ( $F=22.77$ ,  $p .001$ ).

The sum of the subjects' total self-reward and self-punishment on the block design task was computed by adding the total number of chips self-rewarded, subtracting the number of chips self-punished, and adding a constant of 60 to make all scores positive. ANOVA of this data revealed a trend ( $F=3.70$ ,  $p .06$ ) for subjects to reward themselves less on the task, as shown in Table 19. Since the data were skewed, a log transformation of the scores was made, and an ANOVA of this data was computed. A significant main effect ( $F=4.03$ ,  $p .05$ ) was found, indicating that subjects in the anger condition were more critical of their performance than control subjects. This analysis is shown in Table 20. Duncan's multiple range test was performed on the cell means for this variable, and the depressed/anger group differed significantly from the other three groups. Thus, the significant main effect was caused primarily by the lower self-reinforcement scores of the subjects in the depressed/anger group. Means and standard deviations for the self-

Table 15

Number of subjects per condition showing severe performance deficits (doing at least 3 designs incorrectly). Total # of subjects per cell is shown in parentheses.

	Depressed	Nondepressed
Anger	3 (10)	2 (10)
Control	1 (11)	0 (10)

Table 16

Means and standard deviations, number of positive  
and negative adjectives checked.

	Depressed/ Anger Group (N=10)	Nondepressed/ Anger Group (N=10)	Depressed/ Controls (N=11)	Nondepressed/ Controls (N=10)
Positive	10.80 (3.39)	11.20 (3.68)	11.55 (3.45)	12.50 (4.20)
Negative	4.30 (3.71)	1.00 (.94)	3.73 (2.19)	.40 (.52)

Table 17

ANOVA table for number of positive adjectives checked.

Source of Variation	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Signif. of F</u>
Main Effects				
Condition	1	10.574	.55	.580
Depression	1	4.786	.35	.556
2-Way Interactions				
Condition X Depression	1	.787	.06	.811
Residual	37	13.579		

Table 18

ANOVA table for number of negative adjectives checked.

Source of Variation	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Signif. of F</u>
Main Effects				
Condition	1	3.516	.71	.404
Depression	1	111.438	22.77	.001
2-Way Interactions				
Condition X Depression	1	.002	.000	.984
Residual	37	4.94		

Table 19

ANOVA table for raw data, total self-reinforcement.

Sources of Variation	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Signif. of F</u>
Main Effects				
Condition	1	741.041	3.70	.062
Depression	1	508.355	2.51	.122
2-Way Interactions				
Condtion X Depression	1	472.521	2.33	.135
Residual	37	202.627		

Table 20

ANOVA table for log transformation of  
raw data, total self-reinforcement.

Sources of Variation	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Signif. of F</u>
Main Effects				
Condition	1	.087	4.03	.052
Depression	1	.053	2.47	.125
2-Way Interactions				
Condition X Depression	1	.056	2.59	.116
Residual	37	.022		

reward data are shown in Table 21. Figure 1, with self-reinforcement scores plotted by conditions and groups, shows graphically the deviation of this group from the other three.

Correlational analyses were computed on several variables for subjects within the anger condition to explore factors which may have contributed to greater self-criticism by some subjects on the block design task. Of particular interest were the correlations between self-reinforcement scores and initial MAACL scores. None of these correlations were significant. Self-reinforcement does not appear to be related to subjects' report of the intensity of mood anxiety, hostility, or depression after the anger induction. These correlations are shown in Table 22. However, it should be noted that this analysis was done with only 20 subjects.

Since the experimenter noted that several subjects had rewarded themselves for trials on the block design task they had actually done incorrectly, the number of subjects per condition who did this at least once on the six trials was tabulated in Table 23. While no statistical analyses were computed on the data due to the small number of subjects per cell, it appeared that depressed control subjects were most likely to have falsely rewarded themselves.

Interview data. The number of subjects making certain responses during the post-experiment interview was tabulated. These data are shown in Table 24.

Angered subjects were quite likely to criticize the confederate, and to report having felt stupid after the Prisoners' dilemma task. A

Table 21

Means and standard deviations, raw scores and log transformations, total self-reinforcement.\*

	Depressed/ Anger Group (N=10)	Nondepressed/ Anger Group (N=10)	Depressed/ Controls (N=11)	Nondepressed/ Controls (N=10)
Raw Scores	46.90 <sub>a</sub> (17.41)	60.90 <sub>b</sub> (15.60)	62.09 <sub>b</sub> (10.35)	62.50 <sub>b</sub> (12.96)
Log Transformed Scores	1.623 <sub>c</sub> (.249)	1.771 <sub>d</sub> (.116)	1.788 <sub>d</sub> (.070)	1.788 <sub>d</sub> (.088)

\*Differing subscripts for means on a particular variable indicate a difference at the .05 level on Duncan's multiple range test.

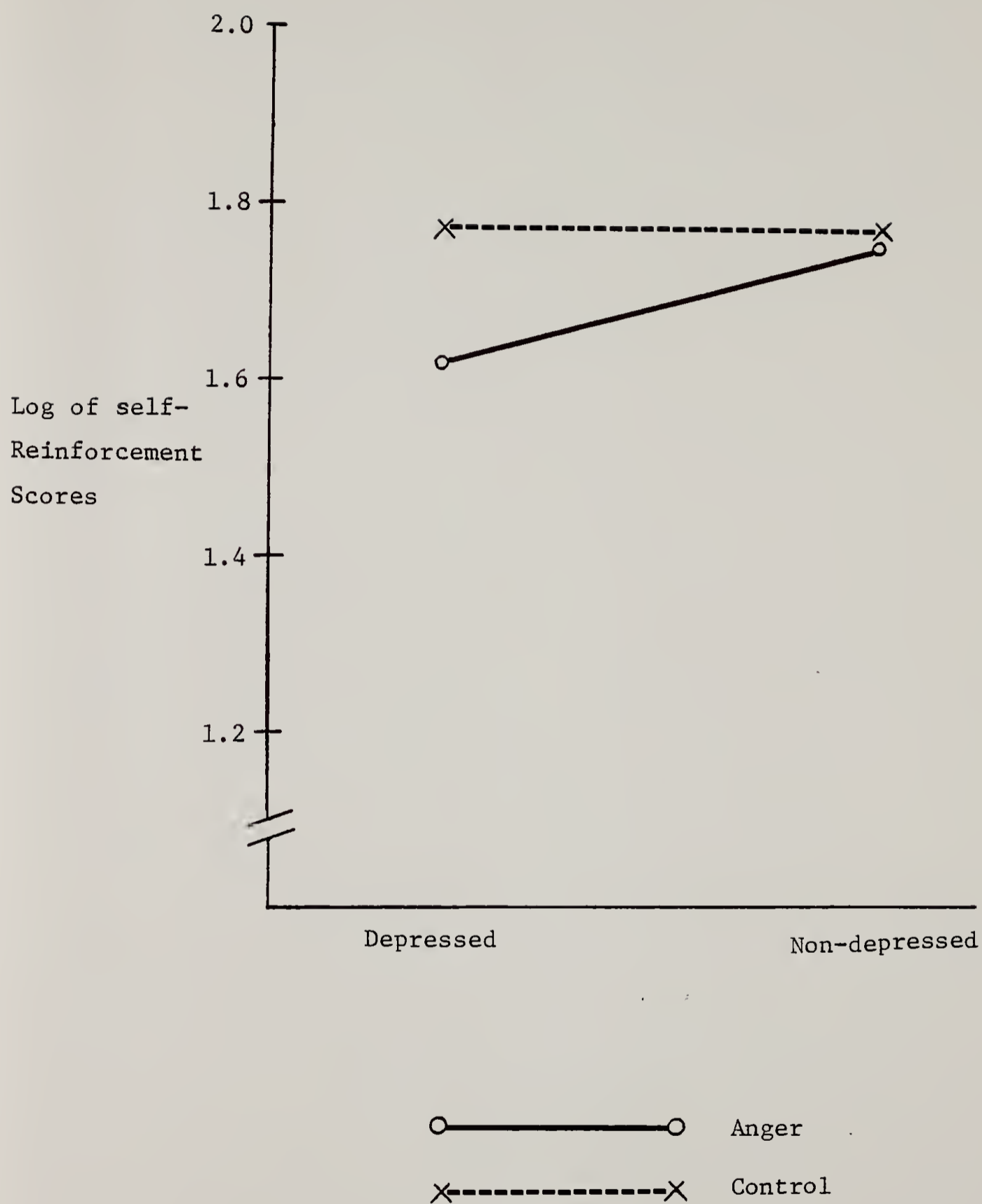


Fig. 1. Log of self-reinforcement scores plotted by groups and by conditions.

Table 22

Pearson correlations between initial MAACL scores  
and total self-reinforcement score, within  
the anger condition. (N=20)

	Anxiety	Hostility	Depression
Self-reinforcement	-.285 (ns)	-.092 (ns)	.060 (ns)

Table 23

Number of subjects per cell who rewarded themselves  
on trials they had done incorrectly.

	Depressed	Nondepressed
Anger	1	2
Control	4	1

Table 24

Number of subjects per cell making certain comments  
during the post-experiment interview.

	Depressed/ Anger (N=10)	Nondepressed/ Anger (N=10)	Depressed/ Control (N=11)	Nondepressed/ Control (N=10)
Devalued or criticized confederate.	8	5	0	0
Felt stupid after first task.	4	6	0	0
Blamed outside factors for block design performance.	3	3	2	3
Felt stupid on block design task.	3	1	0	1
Felt that they turned unexpressed anger in.	8	7	4	5
Felt that some people turn unexpressed anger in.	8	9	7	7

surprisingly high percentage of subjects reported that they believed that unexpressed anger is somehow "turned against the self". No clear differences emerged between depressed and nondepressed subjects.

## C H A P T E R VI

### DISCUSSION

Results provide some support for the theoretical conception that self-criticism is an important factor in depression. Anger may also be a significant variable affecting self-criticism among depressed individuals. The finding that depressed subjects in the anger condition were more self-critical on the block design task than control subjects and angered nondepressed subjects is one predicted by the classic psychoanalytic model and not readily derivable from other theories of depression. The finding is important because not only the psychoanalytic model, but also the cognitive and behavioral self-reinforcement theories would predict that such increased self-criticism could be a causal factor in depression.

It should be noted that the anger induction affected only the measure of self-criticism on the block design task. Depressed subjects were more self-critical in terms of negative adjectives marked on the "Personality Checklist" regardless of condition, and no differences appeared on the measure of positive adjectives checked on the "Personality Checklist". It is not readily discernible why responses to the block design measure were the only measure of self-criticism that varied by experimental condition. One possibility is that self-criticism on the block design task was a measure with little possibility for subjects to link their judgements to "real world" data, and may have forced subjects to use more generalized expectancies about their performance.

Although the psychoanalytic model is the only one predicting a relationship between anger and self-criticism, the results do not necessarily support the process of "hostility turned against the self" as described by such theorists. There was no evidence that depressed subjects "denied" their anger, since their scores on the MAACL did not differ from nondepressed subjects. In addition, correlational analyses showed no significant correlations between the amount of hostility or depression acknowledged on the MAACL and subsequent levels of self-criticism among subjects in the anger condition. Depressed subjects became no more depressed after the anger condition than nondepressed subjects.

Depressed subjects were in fact somewhat more likely to respond "aggressively" with the competitive card during the Prisoners' dilemma task than the nondepressed subjects. Interviews after the study and comments subjects made on the post-experimental questionnaire showed that most subjects in the anger condition, including the depressed subjects, devalued or criticized the confederate in some manner. Some of the comments that subjects made about the confederate on the post-experimental questionnaire were that she was "sneaky", "low", "cheap", and "mean". While a psychoanalytic model might posit that the anger induction activated some "unconscious" aggressive impulses that were then repressed and turned against the self, such an explanation is not parsimonious.

The results may support the notion that "unexpressed" anger leads to increased self-criticism. However, since there was no condition in which the expression of aggression was possible, it is not clear whether

a "cathartic" effect would have occurred if subjects had aggressed against their frustrator.

A more likely explanation for the results seems to be a cognitive one. While the manipulation was construed by the author as one in which a cooperative subject was cheated by an unscrupulous partner, and thus not effecting self-evaluation, many of the subjects in the anger condition reported that their responses to the experience were self-evaluative in nature. At least half the subjects in the anger condition reported feeling "stupid" after having been double-crossed by their partners. Many reported blaming themselves for having been taken in by their partners, as if somehow they were to blame for having trusted the confederate. This attribution of personal responsibility for their outcome and self-blame on the Prisoners' dilemma task may have then carried over into subsequent tasks.

Several subjects reported that they couldn't get the anger situation out of their mind for the rest of the study, while other subjects reported that they were able to block the earlier experience from their minds. The former seemed to "rehearse" the scene for some time after it occurred. An interesting question is whether this rehearsal of the situation would lead to increased self-criticism, as the cognitive and behavioral self-reinforcement models predict, or if "repression" of the incident would be more likely to lead to increased self-criticism.

Several other possible explanations for the results must be examined as well. One alternative explanation for the data is that it was not the anger induction per se that led to increased self-criticism, but that any negative mood induction would have lead to similar results.

This point is supported by the fact that the study's anger induction led to increases not only in hostility, but also in anxiety and depression as measured by the MAACL. The best way to decide such a question is through further research, comparing several mood inductions in their effect on self-criticism.

Another possible explanation may be in the nature of the control condition. Depressed and nondepressed subjects did not differ in their levels of self-criticism on the block design task in this condition, despite the numerous studies showing that depressed individuals are generally more self-critical. It is possible that the control condition with its success experience and cooperation between subject and confederate, may have been a "treatment" serving to eliminate differences which would have normally occurred between depressed and nondepressed subjects on the self-criticism measure during the block design task. It may well be that such positive social contact is highly rewarding for depressed individuals who may have had a low level of social activity and reinforcement. A future study could attempt to sort out such effects by employing "neutral" and "elation" control groups.

Another possible criticism of the study is the fact that a fairly large number of subjects recognized the deception of the anger induction. Since these subjects were not included in the data analysis, it is possible that the effects are due to the operation of some selection factor. Subjects who did not "see through" the deception might be generally less aware of or less sensitized to negative aspects of their environments, and they may have been more self-critical than subjects who recognized the deception. However, it is not clear how such a selection

factor would have produced greater self criticism only in the depressed group.

A particularly interesting factor which the overall results of the study do not adequately capture is the incredible range of individual differences in subjects' responses to the anger induction. For example, one angered subject's hands shook during the entire time she worked on the block design task and her performance was quite poor. Another angered subject who was only able to complete about half of the block designs reported after the study that she had successfully done these tasks many times before, since her father was a psychologist, but that she was unable to concentrate during the study. Thus, the anger induction may have led some subjects to perform extremely poorly on the task. Five subjects in the anger condition, but only one subject in the control condition, put together 3 or more of the block design tasks incorrectly. This effect failed to show up in the analyses, possibly because of the large variance in all subjects' performance.

Several subjects seemingly "denied" their poor performance on block design trials. Altogether, 8 subjects rewarded themselves on trials where they had actually put the designs together incorrectly. These subjects appeared to think they had solved the designs correctly. This phenomenon points out that self-reward may be linked only tenuously to actual performance on a task. Although not reliable due to the small number of subjects in the study, it is of interest that this phenomenon occurred most frequently among depressed subjects in the control condition, possibly accounting for the fact that their level of self-reinforcement was equal to that of the nondepressed subjects.

Another phenomenon of interest is subjects' stated evaluation of the "anger in" hypothesis after they had been through the study. Over 75% of the subjects stated that they believe that unexpressed anger does in fact "turn against" people, and most subjects expressed a good deal of interest in the results of this study. The belief that unexpressed anger is psychologically unhealthy seemed to receive nearly unanimous support from subjects. Many were eager to relate experiences with "feeling down" associated with unexpressed anger, indicating that this concept may be firmly entrenched in the implicit psychological theories held by these female college student subjects.

Overall, the results are promising and worthy of follow-up with additional research. Besides the importance of replicating these results, several questions remain as to the processes that produce self-criticism. First, the question of whether the greater self-criticism by depressed subjects was due to the induction of anger could be examined by comparing an anger induction with other mood inductions, such as fear or sadness. Control conditions could be elaborated to include both a "neutral" and "elation" control group, to determine whether the results of the present study could have been due to an "elation" effect. Another important question is whether the opportunity to aggress or retaliate against the confederate is important in this process and whether such "catharsis" would eliminate the increased self-criticism found for angered depressed subjects.

In the only other study known to experimentally produce increased self-punishment by depressed subjects following anger induction, Forrest and Hokanson (1975) related their results to an instrumental

function of self-punishment. Their data indicated that depressed subjects used self-punishment in an attempt to lessen the likelihood of attack by another subject. They also found a reduction in autonomic arousal by depressed subjects after self-punishment. Further exploration of interpersonal effects on amounts of self-criticism would be of great interest.

The cognitive mediational factors leading to self-criticism among depressed subjects in the anger condition are also worthy of further exploration. One factor is the attribution of personal responsibility in self-criticism. Haley and Strickland (Note 11) have hypothesized that depressed individuals may be more likely to accept personal responsibility for negative outcomes, and Bulman (Note 12) has further hypothesized that depressives engage in "characterological" self blame. In any event, a more thorough assessment of subjects' attributions of blame in future studies might lead to valuable data.

A final area of interest is that sparked by the research of Blatt et.al.(1976), who have hypothesized that 2 major categories of depressives exist: self-critical depressives and dependent depressives. Blatt has produced factor analytic data supporting his idea that depressive symptoms cluster around these 2 dimensions and has developed an instrument which can be used to assign depressed individuals to these categories. The extremely high amount of variance on many measures within the depressed groups point to the value of selecting more homogeneous subgroups of depressed subjects.

Perhaps future studies will demonstrate that the early observations made by Abraham and Freud had a ring of truth to them. Extensions of

this research may lead not only to advances in our understanding of depression but also to increased knowledge about the consequences of failing to express anger.

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## Appendix A

## SELF RATING DEPRESSION SCALE

	None of the time	Little of the time	Some of the time	A good part of the time	Most of the time
1. I feel down-hearted and blue.					
2. Morning is when I feel the best.					
3. I have crying spells or feel like it.					
4. I have trouble sleeping at night.					
5. I eat as much as I used to.					
6. I still enjoy sex.					
7. I notice that I am losing weight.					
8. I have trouble with constipation.					
9. My heart beats faster than usual.					
10. I get tired for no reason.					
11. My mind is as clear as it used to be.					
12. I find it easy to do the things I used to do.					
13. I am restless and can't keep still.					
14. I feel hopeful about the future.					
15. I am more irritable than usual.					

Appendix A (cont.)

	None of the time	Little of the time	Some of the time	A good part of the time	Most of the time
16. I find it easy to make decisions.					
17. I feel that I am useful and needed.					
18. My life is pretty full.					
19. I feel that others would be better off if I were dead.					
20. I still enjoy the things I used to do.					

## Appendix B

## ADJECTIVE CHECK LIST

Below you will find words which describe different kinds of moods and feelings. For each word, decide whether or not it describes how you feel now. If it does, make a mark in the first column on the IBM sheet for the number which corresponds to the word. If a word does not describe your present feeling, then do NOT mark that item at all on the IBM sheet. Because you will only place marks on the IBM sheet for those items which describe how you feel, you will be leaving some items blank. Therefore, please check frequently to make sure that you are marking the correctly numbered item. Some of the words may sound alike, but we want you to mark all the words that describe your feelings. Work rapidly.

- |                 |                 |                  |
|-----------------|-----------------|------------------|
| 1. active       | 18. bored       | 35. disagreeable |
| 2. adventurous  | 19. calm        | 36. discontented |
| 3. affectionate | 20. cautious    | 37. discouraged  |
| 4. afraid       | 21. cheerful    | 38. disgusted    |
| 5. agitated     | 22. clean       | 39. displeased   |
| 6. agreeable    | 23. complaining | 40. energetic    |
| 7. aggressive   | 24. contented   | 41. enraged      |
| 8. alive        | 25. contrary    | 42. enthusiastic |
| 9. alone        | 26. cool        | 43. fearful      |
| 10. amiable     | 27. cooperative | 44. fine         |
| 11. amused      | 28. critical    | 45. fit          |
| 12. angry       | 29. cross       | 46. forlorn      |
| 13. annoyed     | 30. cruel       | 47. frank        |
| 14. awful       | 31. daring      | 48. free         |
| 15. bashful     | 32. desperate   | 49. friendly     |
| 16. bitter      | 33. destroyed   | 50. frightened   |
| 17. blue        | 34. devoted     | 51. furious      |

## Appendix B (cont.)

52. gay	77. mad	102. shaky
53. gentle	78. mean	103. shy
54. glad	79. meek	104. soothed
55. gloomy	80. merry	105. steady
56. good	81. mild	106. stubborn
57. good-natured	82. miserable	107. stormy
58. grim	83. nervous	108. strong
59. happy	84. obliging	109. suffering
60. healthy	85. offended	110. sullen
61. hopeless	86. outraged	111. sunk
62. hostile	87. panicky	112. sympathetic
63. impatient	88. patient	113. tame
64. incensed	89. peaceful	114. tender
65. indignant	90. pleased	115. tense
66. inspired	91. pleasant	116. terrible
67. interested	92. polite	117. terrified
68. irritated	93. powerful	118. thoughtful
69. jealous	94. quiet	119. timid
70. joyful	95. reckless	120. tormented
71. kindly	96. rejected	122. unhappy
72. lonely	97. rough	123. unsociable
73. lost	98. sad	124. upset
74. loving	99. safe	125. vexed
75. low	100. satisfied	126. warm
76. lucky	101. secure	127. whole

## Appendix B (cont.)

- 128. wild
- 129. willful
- 130. wilted
- 131. worrying
- 132. young

## Appendix C

## PERSONALITY CHECKLIST

Below you will find words which describe different kinds of traits. For each word, decide whether or not it describes the kind of person you are. If it does, make a mark in the space next to the word, and if it does not, do not mark the item. Remember, you are to put a mark by words that describe the way that you are most of the time.

_____ absent-minded (-)	_____ arrogant (-)
_____ attractive (+)	_____ bossy (-)
_____ clever (+)	_____ complaining (-)
_____ conceited (-)	_____ confident (+)
_____ considerate (+)	_____ defensive (-)
_____ dependable (+)	_____ dull (-)
_____ efficient (+)	_____ energetic (+)
_____ fearful (-)	_____ immature (-)
_____ impulsive (-)	_____ intelligent (+)
_____ kind (+)	_____ loyal (+)
_____ mature (+)	_____ moody (-)
_____ nagging (-)	_____ nervous (-)
_____ organized (+)	_____ poised (+)
_____ reliable (+)	_____ responsible (+)
_____ rude (-)	_____ self-centered (-)
_____ self-confident	_____ selfish (-)
_____ sincere (+)	_____ slow (-)
_____ strong (+)	_____ temperamental (-)
_____ unfriendly (-)	_____ wise (+)
_____ witty (+)	_____ worrying (-)

## Appendix D

## TASK QUESTIONNAIRE

Besides measuring your performance on various tasks, this study has been interested in the way you felt about doing these particular tasks. We also want to have some idea of what your general reaction to the study was. Knowing how subjects view the study may help us to be more effective and to make it more meaningful both for us and for future subjects. So, please write down your view of the study, just as you might explain it to a friend after you leave the laboratory. Also, feel free to make any suggestions that you feel might help us make our instructions easier to understand or our procedure more effective. Please be honest in your answer.

Appendix E

RATING POST-EXPERIMENT INTERVIEW

1.) What was the most angry the subject looked during the initial task?

None			Very
0	1	2	3

2.) What was the most angry the subject looked during the debriefing?

None			Very
0	1	2	3

Report after the study:

A. Initial task.

<input type="checkbox"/> devalued "other subject"	<input type="checkbox"/> angry about exper. deception
<input type="checkbox"/> devalued money	<input type="checkbox"/> thought, "you can't trust people"
<input type="checkbox"/> felt angry at other subject	<input type="checkbox"/> felt stupid having been cheated
<input type="checkbox"/> suspicious of confederate	

B. Block design:

<input type="checkbox"/> "not good at puzzle solving"	<input type="checkbox"/> felt anxious
<input type="checkbox"/> blaming outside situations (headaches, finals)	<input type="checkbox"/> felt stupid
<input type="checkbox"/> blaming timing, stopwatch	<input type="checkbox"/> having bad luck

C. General:

<input type="checkbox"/> "anger-in" applies to self	<input type="checkbox"/> "anger-in" applies to others
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Rater \_\_\_\_\_

## Appendix F

## CONSENT FORM

I understand that in this study I will be asked to complete a cooperative problem solving task, fill out several questionnaires, and work on an individual problem solving task. In addition, I will be asked to give my reactions to the tasks. The experimenter will answer my questions about the study when we are finished. I also understand that I may withdraw from the study at any time, and that my individual responses will be kept confidential by the experimenter.

Subject's Signature \_\_\_\_\_

Appendix G  
FEEDBACK SHEET

The study which you have just completed was interested in studying how emotional states can influence patterns of self-reward and punishment. The other "subject" of the study was working for the experimenter. She either said something to try to make you angry, or made a neutral communication at the beginning of the study. This was only for the purpose of the experimental manipulation, and was not any reflection of her typical behavior, or of you. We do not like to use deception in our research, but it was necessary for us to do this so that we could study real emotional responses.

The research will help us understand if people tend to direct their emotions toward themselves when they are angry. Subjects for this study were selected from a series of questionnaires that you completed earlier in the semester. We were interested in seeing how individual differences in the way people look at the world make a difference in their responses.

It is important that you not discuss this study with any people who could possibly be future subjects, as their results would be meaningless if they knew about the study before participating. If you have any additional questions about the study, the experimenter will answer them for you.



