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The Effects of Ego-Threat and Task Importance on the Anagram Performance of Depressed-Anxious, Nondepressed-Anxious, and Nondepressed-Nonanxious College Students

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THE EFFECTS OF EGO-THREAT AND TASK IMPORTANCE ON THE ANAGRAM PERFORMANCE
OF DEPRESSED-ANXIOUS, NONDEPRESSED-ANXIOUS, AND NONDEPRESSED-NONANXIOUS
COLLEGE STUDENTS

by

Matthew M. Zarantonello

A Thesis Submitted to the Faculty of the Graduate School
of Loyola University of Chicago in Partial Fulfillment
of the Requirements for the Degree of

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1980

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VITA

The author, Matthew M. Zarantonello, was born on March 23, 1955 in Blue Island, Illinois. His elementary education was obtained at St. Joseph's in Homewood, Illinois, and his secondary education at Marian Catholic High School in Chicago Heights, Illinois.

In September, 1973 he entered Loyola University of Chicago and in June, 1977 received the degree of Bachelor of Science with a major in psychology, graduating Summa Cum Laude. In September, 1977 the author was granted admission to the clinical psychology program of Loyola University. Since that time the author has held positions in the psychology service of Hines Veterans Administration Hospital, and the Loyola Child Guidance Center and Day School. Other published works include: The Effects of Deception and Level of Obedience on Subjects' Ratings of the Milgram Study, Personality and Social Psychology Bulletin, 1978, 4, 81-85; and, The Effects of Ego-Involvement and Task Difficulty on Actual and Perceived Performance of Depressed College Students, Journal of Clinical Psychology, 1979, 35, 285-288.

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The Effects of Ego-Threat and Task Importance on the Anagram Performance
Of Depressed-Anxious, Nondepressed-Anxious, and Nondepressed-Nonanxious
College Students

Hunt and Cofer (1944) were the first to define "psychological deficit" as the decrement in laboratory task performance exhibited by psychiatric patients relative to normals. More recently, Seligman's (1974) learned helplessness theory has provided an explanation for the performance deficit of depressed individuals. The theory ascribes a central role in depression to an intrapsychic mechanism, the perception of independence between responding and reinforcement, which then results in motivational and cognitive deficits in the testing situation.

Although the learned helplessness theory was formulated on the basis of phenomena evident in the animal learning laboratory, research eventually supported the extension of the model to cases of depression in relatively normal college populations. Miller and Seligman (1973) reasoned that if depressed subjects perceived independence between their responses and reinforcement, they should demonstrate less change in their expectancies for success following reinforcement in a skill task than nondepressed subjects. On a chance task, however, these two groups should show no differential changes in success expectancies for reinforcement.

In order to test this hypothesis the authors asked depressed

and nondepressed college students, identified on the basis of a median split of Beck Depression Inventory scores, to perform in both a "motor-skill" task and a "chance-guessing" task. Reinforcement was delivered according to the same fifty percent schedule in both tasks. Subjects estimated their probability of success before all of the ten trials constituting each task. The three dependent measures used to define perception of noncontingency in this study were: (1) the difference between the expectancies given on the first two trials in each task, with all subjects being reinforced on trial one; (2) the final expectancy stated in the task; and (3) the sum of the absolute values of the difference in expectancies between one trial and the next for all trials in which the subject increased his expectancy following positive reinforcement or decreased his expectancy following negative reinforcement. Results showed that nondepressed subjects who performed on the skill task scored significantly higher than the depressed groups on the expectancy change from trial one to trial two, as well as on the expectancy before the final trial. No significant differences in expectancy change were found on the chance task. Significant negative correlations between expectancy change during the skill task and Depression Inventory scores were also obtained, while the chance task produced no such relationship.

Miller and Seligman (1975) then showed that exposing normal college students to inescapable noise before an anagram task resulted in performance deficits comparable to those exhibited by depressed students.

Both depressed and nondepressed-inescapable noise groups required significantly more trials to learn an anagram pattern for solution; showed significantly greater mean latency in solving anagrams; and solved significantly fewer anagrams than nondepressed students who were not pretreated with inescapable noise. The authors speculated that both depressed and nondepressed-pretreated subjects tended to perceive independence between their responses and reinforcement, which then reduced their motivation to respond to a level that impaired subsequent performance. The expectation of noncontingency may have also resulted in cognitive deficits which produced an inability to learn the anagram pattern for solution. It is important to note that the perception of noncontingency was not measured in this particular experiment.

Although the above studies dealt with depressed subjects in relatively normal college populations, some investigators have felt that recent evidence is sufficiently compelling to generalize helplessness phenomena to cases of clinical depression. Abramson, Garber, Edwards, and Seligman (1978) attempted to examine the perception of noncontingency in a clinical population using the same chance-guessing and motor-skill tasks mentioned earlier. It was found that unipolar depressives gave significantly smaller absolute expectancy change estimates in the skill task than normal controls, nondepressed schizophrenics, and depressed schizophrenics. These latter three groups showed no significant differences in the total amount of expectancy change. Unipolar depressives did not give smaller expectancy change estimates during the chance

task. The authors suggested that perception of independence between response and reinforcement is unique to depression, and is not a general feature of psychopathology. It is interesting to note that in this study, significant differences in expectancy change were not found on the same two measures as in the study by Miller and Seligman (1973). Whether this can be attributed to differences in sample characteristics or the unreliability of noncontingency measures cannot be ascertained at this point.

Price, Tryon, and Raps (1978) divided ninety-six psychiatric patients of various diagnoses into three levels of depression according to their scores on the Beck Depression Inventory. It was found that high depressed patients had significantly longer mean anagram solution times, and significantly more failures to solve anagrams than low depressed patients. Low depressed-inescapable noise patients solved significantly fewer anagrams than a combined group of low depressed patients pretreated with either active- or passive-escape paradigms or given no pretreatment at all. There were no significant differences in anagram performance between patients pretreated with active- or passive-escape paradigms. Significant positive correlations were obtained between Depression Inventory scores and number of anagram failures as well as latency to solution of anagrams.

The results of other research which has simultaneously attempted to measure the decrement in anagram performance and perception of noncontingency in depressed samples suggests that the learned helplessness

explanation of psychological deficit is in need of revision. Willis and Blaney (1978) found that depressed and nondepressed students did not differ in their expectancies for success during a motor-skill task. Pretreatment of low depressed subjects with noncontingent feedback also did not result in expectancy differences. However, depressed students were found to have solved significantly fewer anagrams than the nondepressed, but this was not accompanied by reports of perceived non-control over outcomes as assessed by questionnaire after the task. These findings indicate that the perception of noncontingency between responses and reinforcement is not a necessary condition for the occurrence of psychological deficit in individuals manifesting depressive affect. There may be factors other than helplessness and reduced motivation that are responsible for the decrement in anagram performance displayed by depressed individuals.

Sacco and Hokanson (1978) found that depressed and nondepressed-inescapable noise subjects showed significantly less absolute and final expectancy change than nondepressed-no noise subjects on a perceptual task only when subjects thought that the experimenter was interested in their individual scores. Under more private conditions, the depressed students displayed significantly greater expectancy changes than nondepressed students. No differences in anagram performance were found in either public or private conditions. These findings indicate that the perception of noncontingency between responding and reinforcement may not even be a sufficient condition for the manifestation of psychological deficit.

Smolen (1978) found no differences in performance or measures of expectancy change in a group of psychiatric patients who were paid for their participation in the research. The author suggested that a "strong" form of the learned helplessness hypothesis, which states that the perception of noncontingency and performance decrement are unaffected by situational characteristics and are operative in all situations in which depressives are required to perform, may be inaccurate. A weaker form of the helplessness model, which specified that perception of noncontingency and psychological deficit will occur primarily in situations that reflect on attributes of personal importance to the depressed subjects, may provide a better fit with empirical findings. Such a revision of the learned helplessness model would appear very much in line with Beck's (1967) theoretical position, which states that depressive phenomena are evident in response to particular stimulus situations which touch upon the depressed individual's personal attributes. However, Beck has emphasized the role of the depressive's cognitions, such as the negative view of the self which is manifested in the depressive's exceedingly negative self-evaluation of his own performance on a variety of tasks, rather than any observable manifestation of psychological deficit.

The findings of other investigations suggest that a modified version of the learned helplessness model of psychological deficit may be appropriate. Roth and Kubal (1975) found that greater deficit was mani-

festated on a test task when the helplessness-inducing, pretraining task was portrayed as "a good predictor of college grades" rather than simply a "problem in concept formation." Klein, Fencil-Morse, and Seligman (1976) found that high depressed students exhibited greater deficits in anagram performance when the pretraining task was portrayed as a task at which most people succeed.

Zarantonello, Johnson, and Petzel (1979) required depressed and nondepressed college students to unscramble anagrams of either the four- or six-letter variety under differing conditions of involvement in the task. When the more difficult task was portrayed as an intelligence test and subjects were told that their teachers might be allowed to see their test results, depressed students rated themselves as having performed significantly worse than did nondepressed students. However, only a nonsignificant overall trend for depressed students to unscramble fewer anagrams than nondepressed students was exhibited. The authors commented that a task of sufficient complexity may have to be used if deficit is to be manifested by depressed subjects in relatively normal populations. Thus, it is possible that the inclusion of performance data from the four-letter anagram task in the analysis masked any situation specific performance decrement of the depressed students in the above study.

Abramson, Seligman, and Teasdale (1978) have recently provided a reformulation of the learned helplessness framework along the lines of attribution theory. They have stated that the effects of helplessness pretraining will generalize to testing situations according to the type

of attribution for performance made by subjects in relation to their exposure to noncontingent, uncontrollable events. "Global" attributions ("I'm unintelligent") will facilitate the transfer of motivational and cognitive deficits to many varied situations. The authors state, however, that these attributions will only predict the occurrence of psychological deficit in a particular situation, and that it is the perception of noncontingency between responding and reinforcement which causes the deficit. Further it is stated, "The intensity of cognitive and motivational deficit does not depend on the importance of the event." The authors see the importance of the task and the situation surrounding the task as related to the loss of self-esteem following a negative outcome, rather than being a necessary or sufficient condition for the production of the performance deficit.

Some theorists have chosen to interpret the psychological deficit displayed by depressed samples in terms of cognitive interference rather than the perception of noncontingency and reduced motivation. For example, Goffman (1959, 1971) commented that the depressive's elevated concerns with task-irrelevant, self-presentational behaviors may impair performance and account for the deficit displayed. Payne and Hewlett (1960) remarked that depressives are slow because they are distracted by intrusive thoughts and worries during the testing situation.

Evidence for a cognitive interference effect comes primarily from investigations concerned with anxious as well as depressed subjects. For example, Foulds (1952) found that distracting his subjects during a performance situation with auditory stimuli actually improved the performance

of depressives, obsessionals, and anxious subjects possibly because they were then less attentive to their own internal thoughts and worries. Mandler and Watson (1966) found that anxious subjects spent significantly more time worrying than nonanxious subjects about how well they were doing and about how they compared to others while they were working on a pseudo-I.Q. test. It was suggested that the poorer performance of the anxious subjects on the pseudo-I.Q. test was due to these intrusive worries. The cognitive interference position, although somewhat less inclusive and integrative than the learned helplessness position, has a different emphasis in that it implies the performance of depressed and anxious subjects will be impaired in situations involving components of ego-threat.

In sum, the learned helplessness theory and the cognitive interference framework both predict that depressed subjects will display performance deficits relative to nondepressed subjects. The most consistent finding in the research reported above is that depressed subjects solve fewer anagrams than nondepressed subjects. However, the two positions imply different predictions in regard to the situations surrounding the task in which the performance deficits are to be manifested. Miller (1975) suggested that one reason psychological deficit can be considered only a nonspecific indicator of psychopathology is the failure of researchers to attempt to determine what causes the deficit. The author commented that exposing depressed subjects to varying performance conditions, and examining whether or not deficit

occurs in these particular situations, may provide helpful clues as to what is causing the deficit.

Thus, the purpose of the present experiment was to determine the role of the situational characteristics of ego-threat and task importance in the production of psychological deficit, as well as to gain indirect evidence as to whether reduced motivation or cognitive interference is a more adequate explanation of the psychological deficit manifested by depressed college students. The anagram performance of depressed and nondepressed students was compared under three performance conditions: (1) a situation of high ego-threat and importance; (2) an important situation that involved little ego-threat; and, (3) an unimportant, nonthreatening experimental situation. Since it had been suggested that depressed and anxious subjects may suffer from similar cognitive interferences, a group of anxious students were also included in the study in order that their pattern of anagram performance could be compared to that of the depressed sample. Subjects' perception of control and the extent of cognitive interference they experienced under the varying performance conditions were also assessed through the use of a post-task questionnaire.

A strict interpretation of the learned helplessness model suggests that the perception of noncontingency between responses and reinforcement causes the decrement in laboratory task performance for depressed samples, and that this perception of noncontingency is operative in all situations in which depressed subjects are required to perform. This "strong" form

of the helplessness hypothesis predicts a main effect of Subject Classification in relation to anagram performance, such that depressed students unscramble significantly fewer anagrams than nondepressed students in each of the performance conditions utilized in the present experiment. A modified version of the helplessness position, more in line with Beck's (1967) theory, states that the perception of noncontingency and performance deficit will be manifested only in situations involving important attributes of the depressed subjects. This model predicts an interaction of Subject Classification and Performance Condition, such that depressed students unscramble significantly fewer anagrams than nondepressed students only under threatening-important and nonthreatening-important conditions. The cognitive interference framework suggests that the performance of depressed and anxious subjects is impaired by intrusive worrying during the testing situation, and that these interferences are manifested in performance situations involving components of ego-threat. Thus, an interaction of Subject Classification and Performance Condition is also predicted by this model, but depressed and anxious students are expected to unscramble significantly fewer anagrams than nondepressed-nonanxious students only in the threatening-important condition.

METHOD

Subjects. Subjects were 72 undergraduates (36 male, 36 female) selected from a pool of approximately 400 introductory psychology students. They were formed into three groups of 24 each on the basis of their scores on the Beck Depression Inventory (BDI) and the State-Trait Anxiety Inventory (STAI). Students were required to score an 11 or above on the BDI in order to qualify as a subject in the high depressive affect group. A score of 10 or above on the BDI has been considered indicative of at least mild depression in college populations (Bumberry, Oliver, and McClure, 1978). Nondepressed-anxious subjects were required to obtain a raw score of 45 or above on the STAI A-Trait scale (t-scores of 58 and 59 for males and females, respectively), while at the same time having scored a 10 or below on the BDI. Nondepressed-nonanxious subjects had to score a 39 or below on the STAI A-Trait scale (a t-score of 52 for both males and females), and were also required to score a 4 or below on the BDI.

The mean BDI score for the high depressive affect group was 16.00 (S.D. = 5.52), while nondepressed-anxious and nondepressed-nonanxious students obtained a mean score of 5.42 (S.D. = 2.78) and 1.92 (S.D. = 1.32), respectively, on the BDI. The mean STAI A-Trait score for the nondepressed-anxious students was 51.67 (S.D. = 3.24), while depressed and nondepressed-nonanxious students obtained a mean score of 48.58 (S.D. = 9.19) and 29.63 (S.D. = 4.79), respectively. It is important to note at this point that the mean STAI A-Trait

anxiety score of the depressed students in the present experiment very nearly approached that of the nondepressed-anxious students. Thus, the former group of subjects may be more accurately labeled as "depressed-anxious" rather than simply "depressed". Subjects within each of the three groups were then randomly assigned to one of three performance conditions: (1) "threatening-important"; (2) "nonthreatening-important"; and, (3) "nonthreatening-unimportant". Thus, the present experiment was a 3 X 3 design with 8 subjects in each of the nine cells.

Materials. One page of 60 anagrams was administered to each subject in all conditions. These six-letter anagrams were adopted from studies by Feather (1966) and Zarantonello et al. (1979). They were arranged to promote initial success in order to insure that every subject scored some correct answers, and five insoluble anagrams were placed toward the end of the sheet to prevent subjects from unscrambling all the anagrams correctly. The anagram task used in the present experiment is displayed in Table 1.

Three different sets of typewritten instructions were used to manipulate ego-threat and the importance of the task. These instructions represented slight variants of those used by Zarantonello et al. (1979). In the "nonthreatening-unimportant" condition the instructions limited the importance of performance on the task to the concerns of research, and portrayed the task itself as one which "has been claimed to measure many different abilities." The other two instructional sets depicted the test task as a "test (that) has been shown to be a relatively good predictor of college grades." In the "nonthreatening-important"

Table 1

RFATHE
AFILYM
MIDDEL
OCRSEU
VERBLA
ONERSP
INNERD
ONEASS
SECNOD
ERROPP
MOTHRE
LLACER
NDURIG
TERTEB
INUTEM
HERSOW
AGGERD
OMERND
NHAPPE
UESSNL
TPROFI
LEIRCC
DOMRAN
GERIDH
NIDHEB
TOOTAP
RAMHEW
AFMERR
AVEINR
ERYGEN
EKLICF
LICCER

NUDARO
ETERST
GARNEO
LARDLO
WOLFER
TEKSBA
TERNIW
STOCEL
MUSERM
AMYLIF
AISEGT
EMAGLE
FESLNI
UPSLON
OPUSGN
RUBMEN
TERRTU
RIDNEN
HOMERT
LEASPE
TELTIL
CORTDO
EFOCEF
TRELTE
SYWALA
QUESRA
TOBELT
RORMRI

condition the experiment was portrayed as one investigating "the capacity or upper-limit of verbal aptitude displayed by introductory psychology students," while in the "threatening-important" condition the instructions depicted the experiment as examining the "baseline or lowest level of verbal aptitude displayed by introductory psychology students." These instructions are described in full detail in the procedure section of the report.

A separate questionnaire was used to assess subjects' perception of control in the performance situation, the amount of time subjects felt they had spent worrying about their performance on the test, and the subjects' evaluation of their anagram performance through the use of several 10-point, bipolar scales. This post-task questionnaire can be seen in Table 2.

Procedure. The procedure of the present experiment was essentially the same as that used in previous research (Zarantonello et al., 1979). Subjects within each condition were usually run in groups of four. Upon arrival at the laboratory subjects in the "nonthreatening-unimportant" and "nonthreatening-important" conditions were given a subject number through which their data was eventually identified. Subjects in the "threatening-important" condition were instructed to use their names to identify all data and were told that they were "free to terminate their participation in the research at any time." Subjects were then given the instruction sheets designed to manipulate ego-threat and the importance of the task.

Table 2
Questionnaire

(Please circle one dot only)

1. How appropriate would it be for this study to be financed with federal tax money?

 inappropriate appropriate
2. How interesting was this study?

 interesting uninteresting
3. How harmful to subjects was this experiment?

 not harmful harmful
4. How threatening was this experiment?

 threatening not threatening
5. How much control do you feel you had over the quality of your performance and your score on the test?

 very little very much
 control control
6. How well do you think you performed on this test?

 excellent poor
7. How important to you is your performance on this test?

 not important important
8. How much time did you spend thinking about how well you were doing during the test?

 very much very little
 time time
9. How well do you think you could perform on another test just like this?

 poor excellent

"Threatening-Important". Subjects in this condition read the following:

You are taking part in an experiment designed to determine the baseline or lowest level of verbal aptitude displayed by introductory psychology students. The test you are about to take has been shown to be a relatively good predictor of college grades. It will measure your ability to process and reintegrate verbal information on successive trials, one dimension of what is commonly referred to as intelligence.

You will be given a list of anagrams or scrambled words. As you work through the list, write the unscrambled word immediately next to its respective anagram. Try to unscramble as many words as you can in the given time period. When you are through with this task, you will be given a short questionnaire.

After all the subjects in the "threatening-important" condition finished reading their instructions the experimenter asked, "Are there any questions?"

At this point in the threat manipulation a female confederate who posed as a subject asked, "You said that we are going to be taking an intelligence test?"

"That's right," the experimenter replied.

"Well, who's going to be allowed to see the results of this test?" the confederate inquired.

The experimenter then replied in a somewhat confused tone, "Well, it's really hard to say. Since the experiment is about the baseline or lowest level of intelligence of 101 students, some of the 101 teachers will probably show an interest and ask to see your scores, but I don't think that would affect your standing in class. It's also possible that the Student Counseling Service may use your scores for guidance and counseling purposes."

"Okay," the confederate answered. "That's all I wanted to know."

"Nonthreatening-Important". Subjects in this condition read the following:

You are taking part in an experiment designed to determine the capacity or upper-limit of verbal aptitude displayed by introductory psychology students. The test you are about to take has been shown to be a relatively good predictor of college grades. It will measure your ability to process and reintegrate verbal information on successive trials, one dimension of what is commonly referred to as intelligence.

You will be given a list of anagrams or scrambled words. As you work through the list, write the unscrambled word immediately next to its respective anagram. Try to unscramble as many words as you can in the given time period. When you are through with this task, you will be given a short questionnaire.

After all the subjects in the "nonthreatening-important" condition finished reading their instructions the experimenter asked, "Are there any questions?"

At this point in the threat-importance manipulation the confederate who posed as a subject asked, "You said that we are going to be taking an intelligence test?"

"That's right," the experimenter replied.

"Well, who's going to be allowed to see the results of this test?" the confederate inquired.

The experimenter replied, "The results of this test are confidential. No one other than myself will be able to see the test results, and the numbers I have given you will insure that no one will be able to match an answer sheet with the identity of a subject."

"Okay," the confederate answered. "That's all I wanted to know."

"Nonthreatening-Unimportant". Subjects in this condition read the following:

You are taking part in an experiment designed to clarify some of the misconceptions of past psychological research. The test you are about to take has been claimed to measure many different abilities, but the validity of the test is still in question.

You will be given a list of anagrams or scrambled words. As you work through the list, write the unscrambled word immediately next to its respective anagram. Try to unscramble as many words as you can in the given time period. When you are through with this task, you will be given a short questionnaire.

The threat-importance manipulation in this condition involved the use of instructions only. No confederate was used.

The experimenter then passed out a page of 60 anagrams and gave the signal for subjects to begin working. Five minutes later the experimenter said, "Stop working and turn your answer sheet face down on your desk." (The anagram sheets were collected at this point.)

"You will now be given a short questionnaire. Please write your name/subject number on the top of this sheet. Most of the questions are answerable by using a 10-point scale on which you can indicate the strength of your opinion by checking one of the dots in a certain direction. After answering all the questions, please turn the questionnaire face down so I'll know you are through."

The experimenter then distributed a short questionnaire on which subjects rated their perception of the testing situation and their performance along several dimensions. The items of the questionnaire relevant to the concerns of the present research were: (4) How threatening was this experiment? (10-point scale); (5) How much control do you feel you had over the quality of your performance and your score on the test?

(10-point scale); (6) How well do you think you performed on this test? (10-point scale); (7) How important to you is your performance on this test? (10-point scale); and (8) How much time did you spend thinking about how well you were doing during the test? (10-point scale).

After all the subjects in a given group completed the questionnaire, they were given the opportunity to raise any questions they might have had about the experiment. They were informed that the experiment really involved an examination of mood states and test-taking behavior. Subjects were then debriefed and told that their scores on the anagram task would be kept confidential, and they were also given the opportunity to obtain an abstracted description of the experiment.

RESULTS

The design for all following analyses was a 3 X 3 fixed-effects analysis of variance, with the factors and their respective levels as follows: factor A-Subject Classification (depressed-anxious, nondepressed-anxious, nondepressed-nonanxious); factor B-Performance Condition (threatening-important, nonthreatening-important, nonthreatening-unimportant).

Anagram Performance. The means and standard deviations of subjects' anagram performance under the various conditions of ego-threat and task importance is displayed in Table 3. The ANOVA applied to the number of anagrams subjects unscrambled correctly revealed a nonsignificant trend associated with Subject Classification ($F(2,63) = 2.52, .10 > p > .05$). Nondepressed-anxious ($M = 11.42$) and depressed-anxious ($M = 11.46$) students showed a nonsignificant tendency to unscramble fewer anagrams than nondepressed-nonanxious students ($M = 14.08$). The effects of the Performance Conditions on the number of correctly unscrambled anagrams was nonsignificant. The Subject Classification X Performance Condition interaction for anagram performance was also nonsignificant. The graph of subjects' anagram performance under the various performance conditions is shown in Figure 1.

Post-Task Questionnaire. Data from subjects' responses to several items of the post-task questionnaire served as a check on the effectiveness of the "threat-importance" situational manipulation. Results from this data source indicated that the effects of the Per-

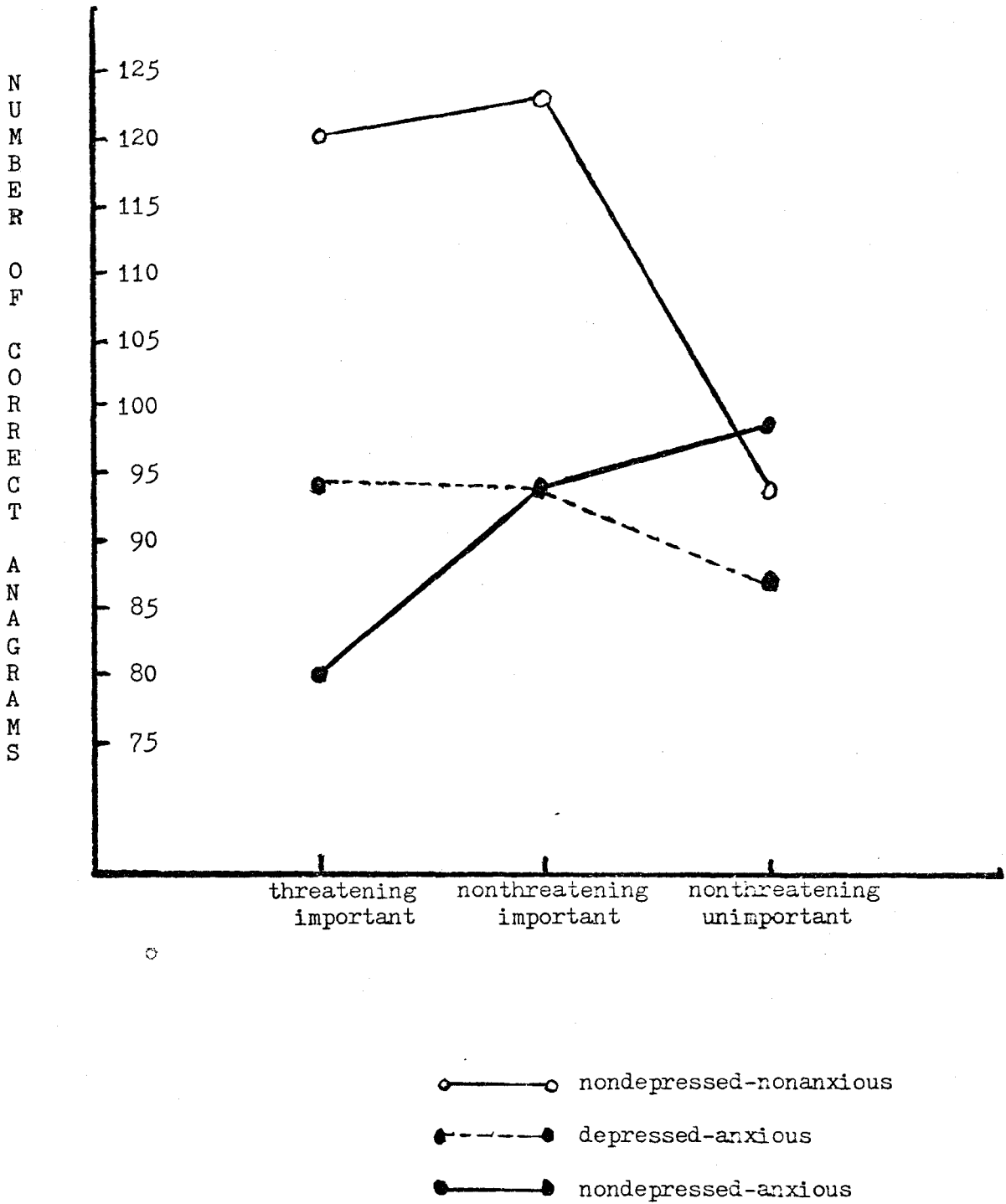
Table 3

Means and Standard Deviations of Subjects' Anagram Performance
Under the Various Conditions of Ego-Threat and Task Importance

	Threatening- Important	Nonthreatening- Important	Nonthreatening- Unimportant
Nondepressed- Nonanxious	M = 15.00 S.D. = 4.66	M = 15.38 S.D. = 2.39	M = 11.88 S.D. = 5.33
Depressed- Anxious	M = 11.75 S.D. = 5.34	M = 11.88 S.D. = 4.52	M = 10.75 S.D. = 4.68
Nondepressed- Anxious	M = 10.00 S.D. = 4.63	M = 11.88 S.D. = 6.42	M = 12.38 S.D. = 3.25

Figure 1

Subjects' Anagram Performance Under the Various Performance Conditions



formance Conditions on subjects' appraisals of the level of threat and importance associated with the various conditions was not as strong as would be expected.

For example, the ANOVA applied to subjects' responses to item 4 of the questionnaire, "How threatening was this experiment?" showed no significant overall effect associated with the Performance Conditions. A planned contrast revealed only a nonsignificant trend for the "threatening-important" ($M = 4.58$) condition to be rated as more threatening than the combined "nonthreatening" ($M = 3.21$) conditions ($F(1,63) = 3.43, .10 > p > .05$). A nonsignificant overall trend for depressed-anxious ($M = 4.58$) and nondepressed-anxious ($M = 3.75$) students to rate the experiment as more threatening than nondepressed-nonanxious ($M = 2.67$) students was also exhibited ($F(2,63) = 2.52, .10 > p > .05$). The interaction of Subject Classification X Performance Condition for subjects' responses to item 4 was nonsignificant as well. The means and standard deviations for subjects' responses to this item are shown in Table 4.

The analysis of subjects' responses to item 7, "How important to you is your performance on this test?" again revealed no significant effects associated with the Performance Conditions. A planned contrast showed that subjects in the combined "important" conditions did not rate their performance on the anagram task as being significantly more important than did subjects in the "nonthreatening-unimportant" condition. The overall effect of Subject Classification on subjects' res-

Table 4

Means and Standard Deviations of Subjects' Responses
To Item 4 of the Post-Task Questionnaire

	Threatening- Important	Nonthreatening- Important	Nonthreatening- Unimportant
Nondepressed- Nonanxious	M = 3.00 S.D. = 2.51	M = 2.75 S.D. = 2.12	M = 2.25 S.D. = 3.15
Depressed- Anxious	M = 6.13 S.D. = 2.80	M = 3.63 S.D. = 3.11	M = 4.00 S.D. = 3.70
Nondepressed- Anxious	M = 4.63 S.D. = 3.16	M = 4.38 S.D. = 3.07	M = 2.25 S.D. = 2.82

1 = not threatening
10 = threatening

ponses to item 7 was nonsignificant, as was the Subject Classification X Performance Condition interaction. The means and standard deviations for subjects' responses to this item of the post-task questionnaire are shown in Table 5.

Subjects' perception of control over their performance was assessed through item 5 of the post-task questionnaire, "How much control do you feel you had over the quality of your performance and your score on the test?" This analysis revealed a nonsignificant trend associated with Subject Classification ($F(2,63) = 2.84, .10 > p > .05$) and Performance Condition ($F(2,63) = 2.72, .10 > p > .05$). Depressed-anxious students ($M = 4.75$) showed a nonsignificant tendency to rate themselves as having less control over the quality of their performance on the anagram task than did nondepressed-anxious ($M = 5.42$) and nondepressed-nonanxious ($M = 6.29$) students. Subjects in the "threatening-important" condition ($M = 4.63$) also showed a nonsignificant tendency to rate themselves as having less control over the quality of their performance on the anagram task than did subjects in the "nonthreatening-unimportant" condition ($M = 5.79$) and the "nonthreatening-important" condition ($M = 6.04$). The interaction of Subject Classification X Performance Condition for subjects' responses to item 5 was nonsignificant as well. The means and standard deviations for subjects' responses to this item are shown in Table 6.

The level of cognitive interference experienced by subjects was assessed through an analysis of their responses to item 8 of the questionnaire, "How much time did you spend thinking about how well you were

Table 5

Means and Standard Deviations of Subjects' Responses
To Item 7 of the Post-Task Questionnaire

	Threatening- Important	Nonthreatening- Important	Nonthreatening- Unimportant
Nondepressed- Nonanxious	M = 4.25 S.D. = 3.20	M = 5.50 S.D. = 1.85	M = 3.88 S.D. = 1.81
Depressed- Anxious	M = 4.38 S.D. = 2.39	M = 4.50 S.D. = 2.20	M = 3.50 S.D. = 2.67
Nondepressed- Anxious	M = 5.25 S.D. = 2.66	M = 6.25 S.D. = 2.55	M = 5.25 S.D. = 3.20

1 = not important

10 = important

Table 6

Means and Standard Deviations of Subjects' Responses
To Item 5 of the Post-Task Questionnaire

	Threatening- Important	Nonthreatening- Important	Nonthreatening- Unimportant
Nondepressed- Nonanxious	M = 5.13 S.D. = 2.70	M = 7.00 S.D. = 2.56	M = 6.75 S.D. = 1.67
Depressed- Anxious	M = 3.88 S.D. = 2.36	M = 5.63 S.D. = 2.20	M = 4.75 S.D. = 1.49
Nondepressed- Anxious	M = 4.88 S.D. = 0.83	M = 5.50 S.D. = 2.45	M = 5.88 S.D. = 3.09

1 = very little control
10 = very much control

doing during the test?" The means and standard deviations for subjects' responses to this item are shown in Table 7. The ANOVA applied to subjects' responses to this 10-point scale revealed a highly significant effect associated with Subject Classification ($F(2,63) = 11.33, p < .001$). Planned contrasts revealed that depressed-anxious ($M = 5.96$) students rated themselves as spending significantly more time worrying about their performance during the test than did nondepressed-nonanxious ($M = 3.88$) students ($F(1,63) = 12.51, p < .001$). Nondepressed-anxious students ($M = 6.55$) also rated themselves as spending significantly more time worrying about their performance than did nondepressed-nonanxious students ($F(1,63) = 20.49, p < .001$). The overall ANOVA revealed no significant effects associated with the Performance Conditions in subjects' responses to item 8. The Subject Classification X Performance Condition interaction was found to be nonsignificant as well.

Subjects' evaluations of the quality of their performance on the anagram task was assessed through an analysis of their responses to item 6 of the questionnaire, "How well do you think you performed on this test?" The ANOVA revealed a highly significant effect associated with Subject Classification in the responses to this item ($F(2,63) = 9.20, p < .001$). Planned contrasts indicated that depressed-anxious students ($M = 3.13$) rated their performance significantly poorer when compared with the self-ratings of performance by nondepressed-nonanxious ($M = 5.13$) students ($F(1,63) = 15.77, p < .001$). Nondepressed-anxious students ($M = 3.42$) were also found to have rated their performance on

Table 7

Means and Standard Deviations of Subjects' Responses
To Item 8 of the Post-Task Questionnaire

	Threatening- Important	Nonthreatening- Important	Nonthreatening- Unimportant
Nondepressed- Nonanxious	M = 4.25 S.D. = 2.05	M = 3.50 S.D. = 2.14	M = 3.88 S.D. = 2.10
Depressed- Anxious	M = 7.13 S.D. = 1.81	M = 5.13 S.D. = 1.73	M = 5.63 S.D. = 2.07
Nondepressed- Anxious	M = 7.00 S.D. = 2.00	M = 6.75 S.D. = 2.25	M = 5.88 S.D. = 2.17

1 = very little time
10 = very much time

the anagram task as significantly poorer when compared to the nondepressed-nonanxious students ($F_{(1,63)} = 11.51, p < .005$). The overall ANOVA revealed no significant effect associated with the Performance Conditions in subjects' evaluations of their performance. The Subject Classification X Performance Condition interaction for item 6 was nonsignificant as well. The means and standard deviations for subjects' responses to this item of the post-task questionnaire are displayed in Table 8.

Table 8

Means and Standard Deviations of Subjects' Responses
To Item 6 of the Post-Task Questionnaire

	Threatening- Important	Nonthreatening- Important	Nonthreatening- Unimportant
Nondepressed- Nonanxious	M = 5.63 S.D. = 1.51	M = 4.75 S.D. = 2.12	M = 5.00 S.D. = 2.27
Depressed- Anxious	M = 3.25 S.D. = 1.75	M = 3.25 S.D. = 1.58	M = 2.88 S.D. = 1.46
Nondepressed- Anxious	M = 3.00 S.D. = 0.38	M = 3.25 S.D. = 1.98	M = 4.00 S.D. = 1.93

1 = poor
10 = excellent

DISCUSSION

The depressed-anxious subjects in the present experiment demonstrated only a nonsignificant trend toward reduced efficiency in anagram solution when compared with nondepressed-nonanxious subjects. This result is inconsistent with the findings of previous research in which a significant decrement in anagram performance was demonstrated by depressed subjects from relatively normal college populations (Miller and Seligman, 1975; Willis and Blaney, 1978).

This discrepancy may be related to differences in the complexity of the anagram task used across studies. In the present experiment, subjects were asked to solve six-letter anagrams that were arranged to promote initial success at the task. This arrangement consisted of a simple transposition of one letter for solution of an anagram (e.g. RFATHE becomes FATHER; MIDDEL becomes MIDDLE), with such anagram structures being used in ten of the first nineteen items on the test sheet. Previous research has either required subjects to detect an anagram pattern for solution in addition to unscrambling the anagrams (Miller and Seligman, 1975), or has used an anagram task that was not arranged to promote initial success (Willis and Blaney, 1978). It is possible that arranging the anagrams to promote initial success reduced the complexity of the task used in the present experiment and standardized subjects manner of approach to the task, thereby obscuring the slight manifestations of psychological deficit that would be evident in a depressed college sample. This interpretation is consistent with the results of a study by Zarantonello, Johnson, and Petzel (1979), who used an identical anagram task and also found a nonsignificant trend for depressed students to unscramble fewer

anagrams than the nondepressed.

The finding that depressed-anxious subjects showed a nonsignificant tendency to unscramble fewer anagrams than nondepressed-nonanxious subjects irrespective of the performance condition can possibly be interpreted as modest support for the learned helplessness explanation of psychological deficit. This framework suggests that psychological deficit will be manifested by depressed subjects regardless of the threat or importance associated with the task situation, and that the performance decrement is due to the depressed subjects' perception of noncontingency between their responses and reinforcement, which then reduces the motivation to respond (Abramson, Seligman, and Teasdale 1978). However, in inspecting Figure 1 it appears that depressed-anxious students displayed greater deficit relative to nondepressed-nonanxious students in the two "important" conditions, with greater similarity in anagram performance being evident in the "nonthreatening-unimportant" condition. Such situational specificity of psychological deficit seems more in line with Beck's (1967) theory or a cognitive interference position in which the ego-threat and task importance associated with the performance situation are deemed necessary for the manifestation of performance decrements by depressed subjects. Nevertheless, confidence cannot be placed in the reliability of these differences due to their lack of statistical significance.

Analysis of subjects' responses to the post-task questionnaire indicated only slight evidence that the various performance conditions were discriminated with respect to a threat dimension, and no evidence that they

were differentiated according to the importance they had for subjects. Subjects may have felt that the three performance conditions were all equally threatening and important. Therefore, data from the analysis of subjects' anagram performance under the various conditions of threat and importance may not represent an adequate test of whether or not psychological deficit is a situation specific phenomena.

Despite the questionable effectiveness of the situational manipulation used in the present experiment, data from the post-task questionnaire yielded several indications of what may have caused the slight performance deficit displayed by depressed-anxious students. The finding that depressed-anxious subjects showed a nonsignificant trend to rate themselves as having less control over the quality of their performance than did nondepressed-nonanxious subjects lends slight support to the learned helplessness or "reduced motivation" explanation of psychological deficit. However, the results from the post-task questionnaire indicated that a cognitive interference explanation of the trend toward reduced efficiency in anagram solution demonstrated by depressed-anxious subjects may be even more appropriate. The cognitive interference position suggests that the performance of depressed and anxious subjects will be impaired in ego-threatening situations by intrusive worrying during the task. Depressed-anxious and nondepressed-anxious subjects demonstrated a nonsignificant overall tendency to rate the experiment as being more threatening than did nondepressed-nonanxious subjects. Both depressed-anxious and nondepressed-anxious subjects in the present experiment rated themselves

as spending significantly more time worrying about their performance on the anagram task than did nondepressed-nonanxious subjects. This latter finding was one of the most reliable differences found between groups on the post-task questionnaire.

The results of this study suggest that the effects of depression-anxiety on subjects' anagram performance and responses to the post-task questionnaire were no more pervasive or detrimental than the effects of anxiety alone. It is also possible that the performance decrement and cognitive interference effects were primarily the result of the anxiety factor operative in both groups of high-affect subjects. It cannot be ascertained whether or not a similar anxiety factor has been involved in previous research on psychological deficit in depression, since researchers rarely attempt to assess the anxiety level of their depressed samples. However, such a confound of affective components in subject samples may in part account for the theoretical debate over the roles of "reduced motivation" vs. "cognitive interference" in the manifestation of psychological deficit in depressed individuals (Miller, 1975). Interference effects may be more likely in depressed samples who are also above average in trait anxiety than in samples that are more "purely" depressed.

Depressed-anxious students also demonstrated a significantly more negative subjective appraisal of their performance on the anagram task than did nondepressed-nonanxious students. Assuming that subjects felt the various performance conditions were all equally threatening and important, this finding is consistent with Beck's (1967) theory as well as the results of previous research (Zarantonello et al., 1979). However, nondepressed-anxious

students were also found to have rated their performance as significantly poorer than did nondepressed-nonanxious subjects. This finding seems to call into question the specificity of the results of past research examining the negative view of the self and performance in depressed samples. Future research may be geared toward determining whether a willingness to endorse negative self-statements is a general feature of "neurotic" pathology or is specific to depression.

In sum, the results of the present experiment do not allow a definitive conclusion regarding the roles of ego-threat and task importance in the production of psychological deficit by depressed individuals. Depressed-anxious students demonstrated only a nonsignificant trend toward reduced efficiency in anagram solution when compared with nondepressed-nonanxious students, and there was little evidence that the subjects in the present experiment differentiated the various performance conditions with respect to the dimensions of ego-threat and task importance. Future research investigating the roles of situational variables in the production of psychological deficit will benefit from constructing performance situations that are maximally orthogonal with respect to relevant dimensions, such as ego-threat and task importance, as well as utilizing a task of sufficient complexity to insure the manifestation of psychological deficit.

The results of the present experiment do suggest, however, that cognitive interference effects may be related to performance decrements displayed by subjects who have scored high on the Beck Depression Inventory. Depressed-anxious and nondepressed-anxious students rated themselves as spending significantly more time worrying about their performance during

the anagram task than did nondepressed-nonanxious students. It is possible that the slight performance deficit and interference effects found in the present experiment were mediated by an anxiety factor involved in both groups of high-affect subjects. These findings indicate that researchers should not be content with simply measuring the psychological deficit of depressed subjects and attributing the performance decrement displayed to the perception of noncontingency and reduced motivation, without the help of auxiliary data from the same experiment. Future research in the learned helplessness framework can possibly minimize interference effects by selecting depressed subjects who have scored in the medium or low range of the distribution of scores on anxiety measures, such as the STAI A-Trait scale. Such a sampling procedure may require the research to be more time consuming and costly, due to a minimum of depressed-nonanxious subjects, but it will increase the interpretability of results.

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APPROVAL SHEET

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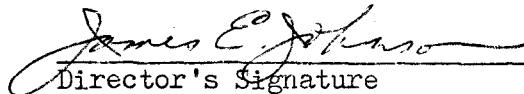
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The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts degree in Clinical Psychology

Date

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