THE EFFECTS OF ITEM DIFFICULTY ARRANGEMENT ON MATHEMATICAL TEST PERFORMANCE: EXAMINING LEARNED HELPLESSNESS IN ACADEMICS

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CHAPTER I

INTRODUCTION

Why do some people repeatedly fail, even when they have the ability to succeed? Failure is a common experience among humans. What separates those who overcome their failures from those who never reach beyond that state? These questions have long plagued educators. Due to the complexity of humans, answers are not easily come by. Certain theories do, however, hold possible answers to this important question. One such theory is learned helplessness. It is the design of this study to investigate the role that learned helplessness plays in the process of acquisition of knowledge. This chapter will explain present theory on the interaction between learned helplessness and the learning process, the research in this area, and the purpose of the present study.

Learned Helplessness Theory

Most people can tell you about times in their lives when they were frustrated and even depressed because they felt ineffective in a situation. This is particularly true for students. What student has not,

at some time, resigned him or herself to absolute apathy because of feelings of "just not understanding this material"? In such a situation, the student may well be experiencing learned helplessness, a general sense of resignation resulting from repeated failure (Seligman, 1975). Learned helplessness is a psychological phenomenon involving a disturbance in motivation, cognitive processes, and emotionality as a result of previous experiences with uncontrollability (Maier & Seligman, 1976; Seligman, 1975).

The phenomenon of learned helplessness is typically associated with the process of learning. The original formulation of the learned helplessness theory was derived from studies of operant and classical conditioning (Overmier & Seligman, 1967; Seligman & Maier, 1967). The premise of this initial theory was that acquisition of learned helplessness is derived from an expectancy for reward or punishment and is based on reinforcement contingencies. When the organism perceives no true relationship between its actions and the negative or positive reinforcer, the organism seemingly makes no attempt to bring about change (Seligman, 1975).

Learned helplessness has been studied and observed in organisms ranging from rats to humans. The basic findings from these studies have been that learned

helplessness demotivates, frustrates, and depresses the organisms experiencing it (Seligman, 1975). This concept has been applied to a diversity of human experiences, most notably depression, death, and achievement (for a review, see Seligman, 1975).

Although this original theory was quite revolutionary in explaining learning deficits and depression, it did not account for individual differences. Consequently, the reformulation of the learned helplessness theory (Abramson, Seligman, & Teasdale, 1978) went beyond the strict behavioral stance and incorporated a cognitive-behaviorist approach. Based largely upon self-efficacy and social learning theory (Bandura, 1977), the theory shifted to an emphasis on attributional styles as the primary determinant of the effects of noncontingent reinforcement situations.

Given two students of equal intelligence and ability at time A but disparate performances on the same task at time B, what factors intervene to create this disparity? Based on the learned helplessness framework, the differences are in the students' cognitions and motivations.

If attributional style influences the interpretation of situations, it would make sense that a gender difference may exist. Such a difference between

genders has been established, particularly in the area of mathematical acheivement (Fennema & Sherman, 1977; Fox, 1976; Hilton & Berglund, 1974; Maccoby & Jacklin, 1974). This difference is further compounded by the effect of attributional style. A difference in attributional style across sexes has been demostrated in several studies (Abramson, Seligman, & Teasdale, 1978; Dweck, Davidson, Nelson, & Enna, 1978). These studies generally support the theory that females tend to have more self-derogating attributional styles and they are less resilient in the face of failure, while males have more self-serving attributional styles. This tendency leads females to be more susceptible to learned helplessness in situations of failure.

Regarding an academic experience, the theory contends that the demotivating effect of learned helplessness inhibits future learning (Covington & Omelich, 1981; Weiner, Heckhausen, & Cook, 1972). Obviously, such an experience hampers the educational process. Elimination of educational practices that induce or augment learned helplessness would, therefore, be important in developing an effective educational system.

In summary, the literature supports the hypothesis that the acquisition of knowledge can be impaired or arrested, via learned helplessness, by repeated failure.

This has a direct bearing on formal educative practices. This study attempts to investigate one unexamined area of application of the learned helplessness theory: testing methods. The question being raised for this study is: What effect does initial exposure to extremely difficult test items have on subsequent performance with similar items?

Purpose of the Study

The purpose of this study was to measure, in a college student population, the effect of exposure to mathematical items of differential levels of difficulty on subsequent performance. Based on learned helplessness theory, it would make sense that testing methods which utilize highly difficult test items would have a propensity to induce conditions of learned helplessness. It is assumed that the difficult items will induce frustration and/or failure in the students, while easier items will have a reinforcing effect. If such an assumption is correct, then testing methods that introduce difficult/challenging material, without first allowing students to develop a sense of confidence and control over the material, may demotivate students and inhibit future learning experiences with similar material.

Statement of Hypothesis

Based on the research and theory, it is assumed that repeated attempts to solve extremely difficult items would result in lowered expectations of ability to correctly solve similar items in the future. The degree and duration of such an effect would, however, be dependent upon the cognitive attributions made by the individual. Thus, the dependent measure will be either positively or negatively affected by the subjects' attributional styles (self-serving vs. self-derogating; Miller & Ross, 1975), depending on the condition and type. As there is a tendancy for females to make more self-derogating attributions and to perform less successfully in mathematics, gender is also expected to be a significant variable.

To summarize, the factors of (a) test item difficulty level, (b) attributional style, and (c) gender were established as having strong potential influence on subsequent performance on mathematical items. These three factors, then, have direct bearing on this present study. A separate hypothesis was set forth for each of these factors. Because the independent variable of experimental condition (Group A vs. Group B) is the main focus of the study, the primary hypothesis concerns this factor. The other two variables (attributional style and gender) are seen as

secondary in the study. Consequently, two supporting hypotheses, related to these factors, are also proposed. The specific directional hypotheses of this study are as follows:

H_1: The mean criterion score of subjects who receive initially difficult items (Group A) on the sequential numbers test will be significantly lower than the mean score of the subjects who received initially easy items (Group B) on the same measure.

H_2: Subjects with self-serving attributional styles (A_{SS}) will demonstrate a higher performance level on the criterion measure than those with self-derogating styles (A_{SD}).

H_3: Females will have a lower performance levels and make more self-derogating attributions than males.

CHAPTER II

REVIEW OF LITERATURE

This chapter reviews the existing theoretical and experimental literature which is relevant to the present study. The chapter first discusses the original formation of the learned helplessness theory. Next is a description of the reformation of the learned helplessness theory. Finally, these theories and related research are examined as they have been applied to the education process.

Learned Helplessness: Original Formation

In 1948, researchers (Mowrer & Viek, 1948) reported an unusual finding in their study with rats. The researchers were conducting an experiment in which rats received electrical shock after being fed. The researchers observed that the rats were more likely to eat if they could control the shock. The key factor involved in the classical conditioning effects was the ability to control the aversive stimulus. This was the first report that demonstrated the basic components of learned helplessness.

Nearly 20 years elapsed between the published findings of Mowrer and Viek and the next reported study of this peculiar phenomenon. The actual term and concept of learned helplessness was first developed in a serindipitous fashion by researchers at the University of Pennsylvania (Overmier & Seligman, 1967; Seligman & Maier, 1967). In this experiment, the researchers were examining the effects of electric shock in classical conditioning with dogs. The dogs that received unescapable, unpredictable shock made no effort to escape later when they had an opportunity to do so. The dogs had to be dragged from their cage many times before they began to make any effort of their own volition. The researchers termed this phenomenon "learned helplessness" because the dogs had seemingly been taught to feel helpless.

Later research showed that the phenomenon occurs also in humans (Hiroto & Seligman, 1975). In this study, the researchers found that students subjected to uncontrolled noise performed worse on a written test than did a control group. Other researchers investigated the role of learned helplessness in the education of children when this education involved noncontigent reinforcement (Dweck & Reppucci, 1973).

Since the mid-70's, there has been a plethora of research on the applications of the learned helplessness

theory to humans, particularly in the area of depression (e.g., Klein & Seligman, 1976; Miller & Seligman, 1975). The experience of depression seems to be entirely analogous to the laboratory studies of learned helplessness.

Learned Helplessness Reformulated

The learned helplessness theory has had a great impact on the psychological community, as evidenced by the large quantity of research in the area. The theory was, however, found to be inadequate in that it failed to fully explain individual differences in susceptibility to learned helplessness. These inadequacies were overcome by incorporating the behavioral perspective of the original theory with theories emphasizing the importance of cognitive processes. Two major influences in the reformulation were J.B. Rotter and Albert Bandura. Rotter (1966) described the differential cognitive appoaches of internal and external views. Bandura advanced the concept of self-efficacy as a major component in task motivation and performance (1977). According to the self-efficacy theory, anticipated ability to complete a given task determines the degree to which an individual is motivated to complete the task.

Borrowing upon the research and theories of such cognitive behaviorists, the original learned

helplessness theory was reformulated to incorporate the individual's attributional style regarding events (Abramson, Seligman, & Teasdale, 1978). In this revised theory, an individual's overall response to failure is largely dependent on his or her explanation for the failure. In their article, Abramson et al. proposed that the learned helplessness response involves three dimensions of attribution; internal vs. external, global vs. specific, and stable vs. instable. Internal, specific, and instable attributions tend to reflect a perceived sense of control. Conversely, external, global, and stable attributions for failure tend to reflect a sense of noncontrol, or learned helplessness. Subsequent research has supported this theory (e.g. Alloy, Abramson, Peterson, & Seligman, 1984; Peterson & Seligman, 1984).

Applied research on learned helplessness has proliferated in many directions, including the area of education. In the educational process, students experience learned helplessness in response to repeated failure, thereby reducing motivation and lowering feelings of self-efficacy. These feelings result in further failure, and the cycle continues. This proposition has been substantiated by many researchers (e.g. Brewin & Shapiro, 1985; Cooper, 1979; Dweck & Licht, 1980; Johnson, 1981; Luchow, Crowl, &

Kahn, 1985). Covington & Omelich (1981) reported decreased motivation in undergraduate college students when they experience subjective failure attributed to personal inability.

Summary

In summary, the research on learned helplessness tends to support the idea that situations in which an organism feels a lack of control over its environment induce a state of assumed helplessness. This helpless state results in a decrease in all efforts to effect change. For humans, the degree to which the environment induces such a state depends largely on the causal attributions made regarding the event(s). When the learned helplessness model is applied to education, it has been demonstrated that repeated failure has a negative effect on future performance.

CHAPTER III

METHODOLOGY

This chapter presents in detail the research methology used in this study. It first describes the pilot study conducted to develop and validate the instrument to measure the dependent variable. Then the main study is described in detail, providing information about the subjects participating in the study and the materials used in the study, including standardization procedures. Finally, the procedures for conducting the experiment and for analyzing the data are then provided.

Pilot Study

Purpose

The design of the experiment required an assessment instrument that was composed of individual items of a similar type, each standardized for the target population. Given these requirements, it was determined that developing such an instrument would be the most appropriate action. Doing this insured a more representative norm group for the experimental group and insured an instrument more consistent with the experimental design.

Materials

In order to minimize extraneous effects of previous exposure or learning, the type of items used needed to be somewhat novel. Sequential number completions provided a unique learning problem. A sequential number completion involves a series of numbers listed in a consistent pattern (e.g. 2, 4, 6, 8, ?). The pattern may be based on either addition, subtraction, multiplication, division, or a combination of any two of those operations. Subjects were asked to find the next logical number in the sequence and were given four possible answers to choose from.

The first step taken in this process was to generate enough of these items to construct two 20-item tests with five items in common. To gather a variant range of difficulty levels, a large pool of items was generated.

Subjects

For the pilot study, 36 undergraduate students from a large Southwestern university were used as subjects. These subjects were drawn from the same student population as the subjects used in the primary experiment, as described later in this chapter. Subject participation was purely voluntary, with no form of reward being provided for participation.

Procedures

The 60 items were divided into three groups of 20 (see Appendices A, B, C). The items for all three groups were arranged according to level of complexity. The items were administered to the subjects, with each subject receiving one of the three 20-item groups. A standard set of instructions (see Appendix D) was read aloud to the subjects. The method of administration was identical to that in the primary experiment, as described in detail later in this chapter. Immediately after administration and completion of the items, subjects were given information on the full nature and purpose of the study.

Primary Experiment

Subjects

The subject group was composed of 140 undergraduate students from a large state university in the Southwest. The subjects were recruited through Introductory Psychology courses. No specifications were placed on the subject pool. Each subject participated voluntarily for extra credit in a psychology class.

Demographic information on the subjects was collected on the cover sheet of the test protocol (see Appendix E). This information revealed that the subject group was composed of 39 males and 101 females. The age of subjects ranged from 17 to 45, but the majority fell

between 18 and 21. The majority of subjects were also freshman and caucasion. The full demographic information is represented in Table I.

TABLE I

SUBJECT DEMOGRAPHIC DATA

Sex		Age		College-Year		Ethnicity	
Male:	27.9%	<18:	.7%	Fresh:	62.9%	Cauc:	89.3%
Female:	72.1%	18:	55%	Soph:	22.1%	Asian:	.7%
		19-21:	33.6%	Junior:	11.4%	Black:	2.1%
		>21:	10.7%	Senior:	3.6%	Hisp.:	.7%
						NatAm:	6.4%

Materials

Sequential Number Completion Test (Form A and B). After data collection from the original 60 items was completed, each item was statistically analyzed for difficulty (percentage of correct responses) and discrimination. Based on this information, 35 items were selected for the two experimental tests. For the difficult form, 15 items were needed and for the easy form, 15 items were also needed. There were five common items for both forms, which served as the dependent

variable measure. The criterion for test item selection is represented in Table II.

TABLE II

TEST ITEM SELECTION CRITERIA

Difficulty Level	% of Correct Responses
Difficult	0 - 45%
Moderate	60 - 70%
Easy	90 - 100%

Two forms of the test were generated (see Appendixes F and G). Each form consisted of 20 sequential number items, as previously described. Both test forms were composed of four pages, with each page containing five items. The forms differed on the first 15 items. The independent variable in the study was the level of difficulty of the first 15 items. One test contained initially difficult items, while the other test contained initially easy items. Group A received the test containing the difficult set of items and Group B received the test with the easy set of items.

Attributional Style Questionnaire (ASQ). The Attributional Style Questionnaire (ASQ; Peterson,Semmel, von Baeuer, Abramson, Metalsky, & Seligman, 1982) was developed to assess the constructs related to the revised learned helplessness theory (see Appendix H). In this questionnaire, subjects are presented six positive and six negative events. Subjects provide their causal attribution for the event and rate their attribution on a 7-point likert-type scale. For each event presented, there are three scales, representing the three general attributional components of learned helplessness (global/specific, internal/external, and stable/instable), for a total of 48 response items. The test yields four scores, one for each of the three general dimensions, and one combined score.

The ASQ has reported internal reliabilities, estimated by Cronbach's (1951) coefficient alpha, ranging from .44 to .69 for the specific dimensions and .75 for the composite score (Peterson et al., 1982). In the same study, the researchers reported five-week test-retest correlations ranging from .57 to .70.

In the present study, the composite ASQ scores (derived by subtracting the negative event composite score from the positive event composite score) were used as an independent variable. This composite score has been used to produced two profiles, described as

"self-serving" and "self-derogating" (Miller & Ross, 1975). Such profiles were used for purposes of this study. To catergorize subjects as either self-serving or self-derogating, a median split was conducted on the composite score. Those subjects scoring above the median were classified as self-serving, those below as self-derogating.

Design

The experiment was designed to measure the effects of frustration related to learned helplessness on test performance. Specifically, the design was two fold. Its goals were to: a) compare subject performance across groups, with Group A receiving intially difficult items and Group B receiving initially easy items; and b) assess the effects of attributional style of subjects within each group.

The structure of the study involved analyzing subject performance on the criterion test item against the three primary independent variables of between-group treatments (easy vs. difficult), within-group attributional styles (self-serving vs. self-derogating), and gender (male vs. female). Since the study involved more than one independent measure (test difficulty and attributional style), analysis of variance or ANOVA 2X2X2 factoral design was the most appropriate type of statistical computation. The study was conducted in two

major phases. The first step, previously described, involved running a pilot study to assess possible experimental design difficulties and to collect data necessary for creating the two test protocols. The second phase involved conducting the actual experiment.

Procedures

The experiment was run in groups of 10 to 20 subjects to simulate a classroom environment. All groups were run within a two week period. During the sessions, both forms of the sequential numbers test were administered simultaneously and randomly distributed. It was believed that simultaneous administration of both test forms would reduce the likelihood of cheating and enhance the subjects' uncertainty regarding their performance relative to other subjects.

Prior to administration of the test, a standard set of instructions were read aloud to the subjects (see Appendix I). Examples of the test items were provided to allow the subjects to become familiar with the items. To insure equal opportunity for both groups on each section and item on the test, the test was timed. The subjects were allowed three minutes and 45 seconds to complete each page (45 seconds per item). After that period of time, all subjects were instructed to stop work on that page and advance to the next page. If subjects completed a page before the alloted time, they

were not permitted to progress beyond that point until time was called. The total time allowed to complete the test was 15 minutes.

Following the completion of the test, the subjects completed the Attributional Style Questionnaire (ASQ) to determine their general attributional style. There was no time limit on the completion of this questionnaire. Once a subject completed the instrument, he or she was free to leave.

Subjects were not fully informed to the true nature of the study until all of the subject groups were run. This was done to minimize subject-interaction effects. Subjects were provided with general information necessary for consent prior to the experiment. Full debriefing occurred immediately after all data had been collected, and was accomplished by distribution of a letter to each participant. The letter described the full nature, purpose, and predicted results of the study.

CHAPTER IV

RESULTS

Using the 2X2X2 ANOVA statistical formula, the three research hypotheses of this study were tested. The two supporting hypotheses (H_2 and H_3) were found to be statistically significant, but the primary hypothesis of the study (H_1) was not significant. Additionally, when the three experimental factors (group, attributional style, and gender) were tested for two-way interaction, no significance was found in any of the combinations, but significance was found for the three-way interaction. The remainder of this chapter will be concerned with detailing the specific data pertaining to these hypothesis, presented via outlined discussions and tables.

Effects of Difficulty Level on Criterion Performance

Surprisingly, the data pertaining to H_1 produced opposite effects than that predicted. That is to say, the subjects in Group A tended to perform better on the criterion items than did the Group B subjects. The mean scores for Groups A and B were 2.100 and 2.457 respectively. The mean scores for each sub-group are

represented in Table III. Although the results fell in the opposite direction of that predicted, the difference was still not great enough to produce significant results, with $F = 2.42$ and $p < .12$ (see Table IV). For H_1, then, the null hypothesis cannot be rejected.

TABLE III

MEAN VALUES FOR ALL GROUPS

	Self-Derogating (SD)		Self-Serving (SS)	
	Male	Female	Male	Female
Group A	3.25	1.86	3.11	2.55
Group B	2.00	1.78	3.45	1.93

Effects of Attributional Style on Criterion Performance

H_2 pertained to the effect of attributional style on the subject's criterion performance. Specifically, it was predicted that, in both experimental conditions, subjects with self-serving attributional styles would perform better on the criterion questions than subjects with self-derogating styles. As shown in Table III, the

only group in which the self-serving subjects did not perform better than their self-aerogating counterparts,

TABLE IV

ANALYSIS OF VARIANCE FIGURES

Source	F score	p value
Sex	16.42	.001
Group	2.42	.12
ASQ	3.99	.05
Sex X Group	.05	NS
Group X ASQ	.01	NS
Sex X ASQ	.12	NS
Sex X Group X ASQ	4.36	.039

was in the Group A males. When statistically analyzed, the data bore out this hypothesis in the direction predicted. The F score for the factor of attributional style was 3.99, which is statistically significant at the .05 alpha level (see Table IV). However, as also represented in Table IV, when attributional style was combined with gender (ASQ X Gender) or test condition

(ASQ X Group), the F scores were .05 and .12 respectively; thus, no significant interaction was found for either combination.

Effects of Gender on Criterion Performance

H_3 pertained to the effect of gender on criterion performance. This hypothesis was strongly supported, as females did consistantly perform worse than males across all groups. Table III demonstrates that the mean score for females was lower when compared with males in all conditions. These results produced a strong within-group difference ($F = 16.42$), which is statistically significant at the .001 alpha level.

Three-way Interaction

When experimental condition, attributional style, and sex (Group X ASQ X Gender) were computed in the ANOVA equation (see Table IV), a significant between-group interaction emerged in the three-way analysis ($F = 4.36$, $p < .039$). The interaction indicates that, when separated according to the three factor matrix, the sub-groups tend to take on patterns different from each other. Although no specific hypothesis was formulated for the three-way interaction, this may be the most significant result produced in the study. The meaning of the interaction and its possible implications are explored further in Chapter V.

Summary

The data from the study was analyzed to test the three experimental hypotheses using a 2X2X2 factoral analysis. The primary hypothesis (H_1) was not found to be statistically significant, and, in fact, the results were opposite to that predicted. The two supporting hypotheses (H_1 and H_2), however, were each supported individually. When any two factors were combined no statistical significance was found in their interaction. Interestingly, significance was found in the three-way interaction (Group X ASQ X Gender).

CHAPTER V

DISCUSSION

What do these results mean? The basic hypothesis of the study (H_1) was not supported, while the two supporting hypotheses were. Perhaps the most intriguing aspect of these results was that the data concerning effects of item difficulty level fell in the opposite direction of that hypothesized. Another very notable product of the statistical analysis was the significance of the three-way interaction, despite the lack of significance in any two-way interactions.

In regard to H_1, two types of conclusions seem to be plausible: either the premise of the formulated hypothesis was incorrect or the research design was inadequate for measuring the proposed phenomenon.

Because the sample size was adequately large and the methods for conducting the experiment were consistent and designed to reduce extraneous variables, reliability of the experiment is unlikely to be a source of error. In the researcher's estimation, the experimental weakness stems more from problems of validity. If we are not to discard the learned

helplessness theory, it must be assumed that the conditions for the phenomenon were not present. As discussed in Chapter I and II, the support for the learned helplessness theory as applied to education has been overwhelming. The most probable conclusion, then, is that the results reflect a weakness in the experimental design. This chapter examines the weaknessness of the study, implications of the study results, and suggestions for additional research in this area.

Implications

As previously stated, the data heavily supported the sex difference predictions, with females performing worse than males in all cases. Attributional style was also statistically significant, supporting the contention that self-serving styles are more resiliant to difficult tasks than self-derogating styles. There seems to be no connection between the variables of gender and attributional style, as virtually no interaction was found in the two-way analysis. Although a direct interaction may not exist, these two factors may be related on an indirect level. The connection emerges when these two factors are combined with the experimental conditions (Group A vs. Group B). This will be explored more thoroughly when discussing the three-way interaction.

The primary focus of the study was to examine the effect of the independent variable (item difficulty level) on subsequent performance. Although the hypothesis was not supported, the results were still noteworthy: They were generally opposite to that predicted. Other than for self-serving males, all groups of subjects performed better in the Group B condition (difficult items) condition.

The differences might be attributable to random error. This is unlikely, however, because all but one sub-group in the difficult item condition (Group A) attained higher scores than the counterparts in the easy item condtion (Group B). The overall difference between the scores for Group A and Group B was only statistically significant at the .141 level; therefore, any interpretation at this level must be made cautiously.

Influencing Factors

As mentioned before, the subjects receiving difficult test items tended to perform better on the moderately difficult criterion items, as compared with the subjects receiving easy items. It would appear that the Group B subjects were motivated, even challenged by the difficult items. To explain the occurrence of a phenomenon so contrary to that predicted, the design of the study must be closely examined.

It is important to remember that the experiment was designed to simulate a classroom as closely as possible. This type of design, combined with constraints of subject recruitment, time, and facilities, made certain weaknesses inherent in the study.

There are three factors to consider in relation to the experimental design: brevity of the test, lack of personal investment in performance, and lack of direct performance feedback.

Brevity of the Test

Regarding brevity, the problem was a limitation of time and extensiveness of the mathematical test the subjects took. It only consisted of 15 test items followed by five criterion items. Whether such a brief experience could constitute a learning situation seems to be highly questionable. Fifteen items may be an insufficient number of trials to establish an efficacy or outcome expectancy for future trial outcomes. As the learned helplessness theory contends, expectations for future outcomes are integral to the learning experience (Abramson, Garber, & Seligman, 1980).

Investment

Another consideration connected with the study design is the degree of subject investment. The assumption that the subjects' motivational level or investment in the mathematical test would be strong

enough to influence their overall motivation or cognitive set may have been somewhat errorneous. Naturally, a subject participating in a study only for extra credit would not have the same degree of personal investment in his/her performance as someone in an actual academic setting. It makes intuitive sense that failure at a task perceived as trivial would not have the same impact as failure at a task viewed as integral to self-esteem. Hollon and Garber (1980) have suggested that degree of value an individual places on task performance directly affects the intensity of success or failure. Although the reformed learned helplessness theory accounts for subjective interpretation of an event, it doesn't specifically account for personal investment. This may be an element that warrants further clarification.

Feedback

Perhaps the most important consideration in explaining the absence of learned helplessnes effects in the study is the factor of feedback. In an attempt to replicate a classroom setting, the experimental design made no effort to provide direct feedback to the subjects regarding their performance. Failure or success was left for subjective interpretation. The implications of this aspect of the study may be the most important. The overall data and literature in this area

seem to support feedback as a crucial element in the learned helplessness/academics connection. This element seems to explain not only the lack of performance deficits, but also the three-way interaction noted.

The perception of failure is a key element in the learned helplessness phenomenon, particularly when considering subjective attributions. When no direct external feedback is present, the individual's perception of his or her performance may not parallel the actual performance level. The items used in the study were multiple choice, which made guessing the correct answer a constant possibility. When a situation leaves determination of failure open to subjective interpretation, as this one does, the individual is naturally be more resistant to the acquisition of learned helplessness.

Three-way Interaction

The other major issue that needs to be addressed is the meaning of three-way interaction. This interaction indicates that when the data is sorted according to the three factor matrix, a significant difference emerges in the patterns of the individual sub-groups. In other words, the full breakdown is important in a complete undrstanding of the results.

When examined more closely, the data revealed that males performance patterns were irregular across

attributional style, while females' patterns were consistant. As mentioned before, the most divergent pattern was for self-serving males. Only in this sub-group were performance levels better for Group B subjects. The other male sub-group (self-derogating males) showed the most dramatic difference between Group A and Group B subjects, with a mean score of 3.25 and 2.00 repsectively. The challenge is explaining these varied patterns.

The explanation may very well rest in two issues already touched on, specifically, feedback and sex differences. In the area of mathematics, expectations for performance would tend to be different between the sexes. There has been evidence that differential reactions occur between males and females in response to lack of direct feedback for academic performance. Dweck and Licht (1980) have noted that negative attributions do not occur in girls even when their performance is low if these errors are not noted by a teacher. In other words, if no direct feedback is present, negative attributions and learned helplessness are unlikely to occur in the face of failure. The fact that this applies specifically to females, would be in line with results of the present study. In a similar study, it was shown that boys, not girls, were likely to be negatively effected by peer evaluation of failure (Dweck

& Bush, 1976). Since the only feedback occuring in the experiment was a subjective estimation of the other subjects in the room, it would follow that males in our study would more affected by the experiemental conditions.

Another important question to address is why subjects were not motivated by the apparent success experienced from completing easy questions. It seems plausible that for those subjects receiving easy questions (Group B), the items were so unchallenging that subjects became complacent, and any motivation they experienced wore off. This, however, is not the case for self-serving males. This group appeared to be greatly motivated by the easy questions. Knowing that males tend to be more competitive with their peers and that a self-serving style would lead to feelings of efficacy when succeeding at a task, one is not surprised to find that the motivation level for self-serving males is elevated by early successes.

Summary

In summary, the results of the study were quite interesting, albeit opposite to those predicted. The factors of gender and attributional style were statistically significant beyond the .05 alpha level, and the three-way interaction of gender, attributional

style, and experimental condition was also significant beyond the .05 alpha level.

Although any explanation of these results are purely speculative at this time, they may be attributable to the motivating element of attempting a difficult task and to lack of direct feedback. Since the test consisted of only twenty items and no direct feedback was provided, it may well be that the subjects never developed a salient feeling of failure.

Following the line of reasoning established, the following seems to be a plausible explaination for the findings in this study:

Since no direct feedback of failure was present, learned helplessness was not generally experienced. Instead, subjects tended to be motivated by the difficult items. The overall result was that the initial exposure to either easy or difficult mathematical items had a varied effect on the subjects. The type of effect was dependent both upon gender and attributional style. The subject matter probably played a major role in the discrepancy between genders, and there is also some support for the notion that gender also effects the type of impact feedback has on motivation and attributions.

Suggestions for Future Research

Why are some attributional styles motivated by difficult questions while other styles are motivated by easy questions? Why do males react differently than females in response to difficulty level type? To what degree does subject matter affect in these gender differences? To what degree does feedback type, or lack of, influence the results of the study? These questions may offer an ocean of potential research.

Potential studies might involve testing the specific differential reaction to teaching styles. It may be that certain individuals are best motivated by challenging material while others are motivated by easy material. Other studies might examine the role that direct feedback has on motivation, as opposed to indirect or no feedback. The findings of such research might have far-reaching implications.

References

Abramson, L. Y., Garber, J., & Seligman, M. E. P (1980). Attributional analysis of helplessness. In J. Garber & M. E. P. Seligman (Eds.), Human helplessness: Theory and application (pp. 3-34). New York: Academic Press.

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychology, 87, 49-74.

Alloy, L. B., Abramson, L. Y., Peterson, C., & Seligman, M. E. P. (1984). Journal of Personality and Social Psychology, 46, 681-687.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191-215.

Brewin, C. Y., & Shapiro, D. A. (1985). Selective impact of reattribution of failure instructions on task performance. Journal of Social Psychology, 24, 37-46.

Cooper, H. M. (1979, September). Understanding Pygmalion: The social psychology of self-fulfilling classroom expectations. Presented at the 87th Annual Convention of the American Psychological Association, New York.

Covington, M. V., & Omelich, C. L. (1981). As failures

mount: Affective and cognitive consequences of ability demotion in the classroom. Journal of Educational Psychology, 73, 796-808.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. Psychometrika, 16, 297-334.

Dweck, C. S., & Bush, E. S. (1976). Sex differences in learned helplessness: I. Differential debilitation with peer and adult evaluators. Developmental Psychology, 12, 147-156.

Dweck, C. S., Davidson, W., Nelson, S., & Enna, B. (1978). Sex differences in learned helplessness: II. The contingencies of evaluative feedback in the classroom and III. An experimental analysis. Developmental Psychology, 14, 268-276.

Dweck, C. S., & Licht, B. G. (1980). Learned helplessness and intellectual achievement. In J. Garber & M. E. P. Seligman (Eds.), Human helplessness: Theory and application (pp. 197-221). New York: Academic Press.

Dweck, C. S., & Reppucci, N. D. (1973). Learned helplessness and reinforcement responsibility in children. Journal of Personality and Social Psychology, 25, 109-116.

Fennema, E., & Sherman, J. (1977). Sex-related differences in mathematics achievement, spatial visualization, and affective factors. American Educational Research Journal, 14, 51-71.

Fox, L. H. (1976). Sex differences in mathematical

precocity: Bridging the gap. In D. P. Keating (Ed.), Intellectual talent: Research and development. Baltimore: The John Hopkins University Press.

Hilton, T. L., & Berglund, G. W. (1974). Sex differences in mathematics achievement: A longitudinal study. Journal of Education Research, 67, 231-237.

Hiroto, D. S., & Seligman, M. E. P. (1975). Generality of learned helplessness in man. Journal of Personality and Social Psychology, 31, 311-327.

Hollon, S. D., & Garber, J. (1980). A cognitive-expectancy theory of therapy for helplessness and depression. In J. Garber, & M. E. P. Seligman (Eds.), Human helplessness: Theory and application (173-195). New York: Academic Press.

Johnson, D. S. (1981). Naturally acquired learned helplessness: The relationship of school failure to achievement, behavior, attributions, and self-concept. Journal of Educational Psychology, 73, 174-180.

Klein, D. C., & Seligman, M. E. P. (1976). Reversal of performance deficits in learned helplessness and depression. Journal of Abnormal Psychology, 85, 11-26.

Luchow, J. P., Crowl, T. M. , & Kahn, J. P. (1985). Learned helplessness: Perceived effects of ability on academic performance among ED and LD/EH children. Journal of Learning Disabilities, 18, 470-474.

Maccoby, E., & Jacklin, C. N. (1974). The psychology of sex differences. Stanford, CA: Stanford University Press.

Maier, S. F., & Seligman, M. E. P. (1976). Learned helplessness: Theory and evidence. Journal of Experimental Psychology: General, 105, 3-46.

Miller, D. T., & Ross, M. (1975). Self-serving biases in the attribution of causality: Fact or fiction? Psychological Bulletin, 82, 213-225.

Miller, W. R., & Seligman, M. E. P. (1975). Depression and learned helplessness in man. Journal of Abnormal Psychology, 84, 228-238.

Mowrer, O. H., & Viek, P. (1948). An experimental analogue of fear from a sense of helplessness. Journal of Abnormal and Social Psychology, 43, 193-200.

Overmier, J. B., & Seligman, M. E. P. (1967). Effects of inescapable shock upon subsequent escape and avoidance learning. Journal of Comparative and Physiological Psychology, 63, 28-33.

Peterson, C., & Seligman, M. E. P. (1984). Causal explanations as a risk factor for depression: Theory and evidence. Psychological Review, 91, 347-374.

Peterson, C., Semmel, A., von Baeyer, C., Abramson, L. Y., Metalsky, G. I., & Seligman, M. E. P. (1982). The Attributional Style Questionnaire. Cognitive Therapy and Research, 6, 287-299.

Rotter, J. B. (1966). Generalized expectancies for internal vs. external control of reinforcements. Psychological Monographs, 80, (Whole no. 609).

Seligman, M. P. (1975). Helplessness: On depression, development, and death. San Francisco: W.H. Freeman and Co.

Seligman, M. E. P., & Maier, S. (1967). Failure to escape traumatic shock. Journal of Experimental Psychology, 74, 1-9.

APPENDICES

APPENDIX A

SEQUENTIAL NUMBERS (PILOT STUDY)

FORM 1

1) .3 : .6 : .9 : 1.2 : ?

a) 1.5
b) 1.4
c) 1.23
d) 1.75

2) 3 : 7 : 15 : 31 : ?

a) 62
b) 115
c) 60
d) 63

3) 11 : 24 : 50 : 102.....

a) 206
b) 280
c) 200
d) 450

4) 3328 : 832 : 208 : 52 : ?

a) 8.66
b) 13
c) 11.55
d) 26

5) 6 : 30 : 150 : 750 : ?

a) 3,750
b) 3,500
c) 1,300
d) 2,250

6) 3,150 : 525 : 87.5 : 14.58 : ?

a) 3.28
b) 4.86
c) 2.43
d) 3.52

7) 30,000 : 5,975 : 1,170 : 209 : ?

a) 34.26
b) 16.8
c) 41.38
d) 39

8) 8,400 : 4,204 : 2,106 : 1,057 : ?

a) 588.5
b) 532.5
c) 528.5
d) 523

9) 14 : 21 : 28 : 35 : ?

a) 49
b) 36
c) 70
d) 42

10) 12 : 8 : 4 : 0 : ?

a) .25
b) -2
c) .5
d) -4

11) 100 : 50 : 25 : 12.5 : ?

a) 8
b) 2.5
c) 6.75
d) 6.25

12) 90 : 30 : 10 : 3.33 : ?

a) 2.5
b) 1.11
c) 3
d) .55

13) 2 : 4 : 10 : 28 : ?

a) 56
b) 88
c) 82
d) 46

14) 30 : 84 : 246 : 732 : ?

a) 2,145
b) 2,190
c) 3,564
d) 964

15) 300 : 223 : 146 : 69 : ?

a) 6
b) 23
c) -8
d) -49

16) 750 : 615 : 480 : 345 : ?

a) 210
b) 280
c) 225
d) 220

17) 246 : 132 : 75 : 46.5 : ?

a) 28.75
b) 18.35
c) 32.25
d) 23

18) 24 : 63 : 219 : 843 : ?

a) 1,286
b) 1,646
c) 3,339
d) 4,682

19) 2.5 : 4.0 : 5.5 : 7 : ?

a) 9
b) 12.5
c) 8.5
d) 9.75

20) 1,083 : 846.3 : 609.6 : 372.9 : ?

a) 146.12
b) 136.2
c) 127.3
d) 89.12

APPENDIX B

SEQUENTIAL NUMBERS (PILOT STUDY)

FORM 2

1) 4 : 20 : 100 : 500 : ?

a) 1000
b) 750
c) 2500
d) 10,000

2) 100 : 89.5 : 79 : 68.5 : ?

a) 42.4
b) 58
c) 54
d) 32

3) 30 : 61 : 92 : 123 : ?

a) 398
b) 246
c) 154
d) 130

4) 5.3 : 3.6 : 1.9 : .2 : ?

a) -.06
b) .1
c) -1.5
d) -1.1

5) 4 : 7 : 13 : 25 : ?

a) 38
b) 75
c) 125
d) 49

6) 11 : 22 : 33 : 44 : ?

a) 55
b) 88
c) 164
d) 92

7) .3 : .6 : .9 : 1.2 : ?

a) 1.5
b) 1.4
c) 1.05
d) 1.75

8) 2,500 : 500 : 100 : 20 : ?

a) 2
b) 15
c) 16
d) 4

9) 5 : 12 : 26 : 54 : ?

a) 110
b) 168
c) 98
d) 102

10) 3.5 : 14 : 56 : 224 : ?

a) 676
b) 846.5
c) 1120
d) 896

11) 2,010 : 2,185 : 2,360: 2,535: ?

a) 3,802.5
b) 2,710
c) 3,295.5
d) 2,630

12) .84 : 1.42 : 1.71 : 1.85 : ?

a) 1.92
b) 3.12
c) 1.89
d) 2.15

13) 1500 : 305 : 66 : 18.2 : ?

a) 8.64
b) 6.06
c) 4.55
d) 3.03

14) 6 : 7.25 : 8.5 : 9.75 : ?

a) 19.5
b) 18.25
c) 14.25
d) 11

15) 200 : 390 : 770 : 1530 : ?

a) 4590
b) 3660
c) 3025
d) 3050

16) 1,000 : 778 : 556 : 334 : ?

a) 112
b) 224
c) 92
d) 212

17) 4 : 10 : 25 : 62.5 : ?

a) 156.25
b) 187.5
c) 87.5
d) 250

18) 50 : 148 : 442 : 1324 : ?

a) 3,970
b) 4,648
c) 3,974
d) 1,766

19) 160 : 190 : 220 : 250 : ?

a) 380
b) 280
c) 500
d) 275

20) 220 : 111 : 56.5 : 29.25 : ?

a) 15.62
b) 7.02
c) 21
d) 12.65

APPENDIX C

SEQUENTIAL NUMBERS (PILOT STUDY)

FORM 3

1) 14 : 21 : 28 : 35 : ?

a) 49
b) 36
c) 70
d) 42

2) 90 : 30 : 10 : 3.33 : ?

a) 2.5
b) 1.11
c) 3
d) .55

3) 1500 : 300 : 60 : 12 : ?

a) 2.4
b) 3
c) .15
d) 6

4) 6 : 11 : 21 : 41 : ?

a) 61
b) 82
c) 93
d) 81

5) 362 : 178 : 86 : 40 : ?

a) 13.33
b) 27
c) 21
d) 17

6) 30 : 25 : 20 : 15 : ?

a) 8.5
b) 10
c) 5
d) 12

7) 2,800 : 740 : 225 : 96.25 : ?

a) 18.05
b) 24.06
c) 64.06
d) 33.75

8) 1 : 10 : 100 : 1,000 : ?

a) 3,605
b) 10,000
c) 1,010
d) 1,000,000

9) 3,600 : 600 : 100 : 16.66 : ?

a) 1.38
b) 2.38
c) 2.77
d) 3.33

10) 25 : 75 : 225 : 675 : ?

a) 3375
b) 2025
c) 2725
d) 1350

11) 4 : 20 : 100 : 500 : ?

a) 1,000
b) 750
c) 2,500
d) 10,000

12) .015 : .045 : .135 : .405 : ?

a) 1.805
b) 4.145
c) .845
d) 1.215

13) 3 : 7 : 15 : 31 : ?

a) 62
b) 115
c) 60
d) 63

14) 15 : 29.5 : 58.5 : 116.5 : ?

a) 232.5
b) 349.5
c) 243.5
d) 278

15) .8 : 3.2 : 12.8 : 51.2 : ?

a) 409.6
b) 153.6
c) 307.22
d) 204.8

16) 8400 : 4190 : 2085 : 1032.5 : ?

a) 444.16
b) 506.25
c) 532.25
d) 565

17) 2 : 6.2 : 18.8 : 56.6 : ?

a) 113
b) 75.4
c) 170
d) 62.8

18) 30 : 75 : 210 : 615 : ?

a) 1,910
b) 1,075
c) 1,775
d) 1,830

19) 11,200 : 2,800 : 700 : 175 : ?

a) 35
b) 43.75
c) 40.25
d) 22.25

20) 100 : 210 : 430 : 870 : ?

a) 1640
b) 980
c) 1750
d) 1,090

APPENDIX D

STANDARDIZED INSTRUCTIONS (PILOT STUDY)

The test you will be taking on the following pages consists of sequential number problems (i.e. 3, 6, 9, 12, ? - Ans. 15). The object of the problems is to determine the pattern and complete the sequence. There will be four answer selections to choose from, and you circle the answer you feel is correct. A sequence may be composed of a pattern of either addition, subtraction, multiplicatio division, or a combination of any two. For example:

Addition

2, 4, 6, 8, ? Answer: 10 Pattern: +2

Subtraction

25, 20, 15, 10, ? Answer: 5 Pattern: -5

Multiplication

4, 8, 16, 32, ? Answer: 64 Pattern: x 2

Division

120, 60, 30, 15, ? Answer: 7.5 Pattern: 1/2

Combination

6, 10, 18, 34, ? Answer: 66 Pattern: x2, -2

APPENDIX E

DEMOGRAPHIC DATA FORM

ID#_____

Thank you for agreeing to participate in this study. We are interested in collecting information about college students' mathematical reasoning abilities. Your participation in this study is entirely voluntary and you may withdraw from the study at any time. Your involvement in this study should take approximately 50-60 minutes and will consist of completing a mathematical reasoning test and questionnaires. All of your responses will be kept strictly confidential and anonymous. If you should have any questions about this study, please contact Gary Petiprin (372-9177) or Dr. Mark Johnson, Applied Behavioral Studies, (624-6036). Again thank you for for your participation.

1. Sex _____ Male

   _____ Female

2. Age _____

3. Year in college:
   _____ Freshman
   _____ Sophomore
   _____ Junior
   _____ Senior
   _____ Graduate Student

4. Ethnicity:
   _____ Asian American
   _____ Black
   _____ Caucasian
   _____ Hispanic
   _____ Native American
   _____ Other:_____

APPENDIX F

SEQUENTIAL NUMBER TEST

GROUP A

Instructions

Circle the letter for the correct answer. I.D. _____

1) 1644 : 580.5 : 226 : 107.83 : ?

a) 36.28
b) 48.03
c) 68.44
d) 79.03

2) 42 : 81 : 198 : 549 : ?

a) 1547
b) 1248
c) 1602
d) 1788

3) 288 : 163.25 : 100.87 : 69.68 : ?

a) 54.09
b) 37.34
c) 3.78
d) 35.34

4) .38 : 5.26 : 15.02 : 34.54 : ?

a) 103.58
b) 73.58
c) 87.22
d) 112.28

5) 1500 : 305 : 66 : 18.2 : ?

a) 8.64
b) 6.06
c) 4.55
d) 3.03

Do Not Turn Page until instructed to.

6) 2,800 : 740 : 225 : 96.25 : ?

a) 18.05
b) 24.06
c) 64.06
d) 33.75

7) .015 : .045 : .135 : .405 : ?

a) 1.805
b) 4.145
c) .845
d) 1.215

8) 30 : 75 : 210 : 615 : ?

a) 1,910
b) 1,075
c) 1,775
d) 1,830

9) 30,000 : 5,975 : 1,170 : 209 : ?

a) 34.26
b) 16.8
c) 41.38
d) 39

10) 8,400 : 4,204 : 2,106 : 1,057 : ?

a) 588.5
b) 532.5
c) 528.5
d) 523

<u>Do Not Turn Page</u> until instructed to.

11) 30 : 84 : 246 : 732 : ?

a) 2,145
b) 2,190
c) 3,564
d) 964

12) 300 : 223 : 146 : 69 : ?

a) 6
b) 23
c) -8
d) -49

13) 246 : 132 : 75 : 46.5 : ?

a) 28.75
b) 18.35
c) 32.25
d) 23

14) 24 : 63 : 219 : 843 : ?

a) 1,286
b) 1,646
c) 3,339
d) 4,682

15) 1,083 : 846.3 : 609.6 : 372.9 : ?

a) 146.12
b) 136.2
c) 127.3
d) 89.12

Do Not Turn Page until instructed to.

16) 200 : 390 : 770 : 1530 : ?

a) 4590
b) 3660
c) 3025
d) 3050

17) 4 : 10 : 25 : 62.5 : ?

a) 156.25
b) 187.5
c) 87.5
d) 250

18) 220 : 111 : 56.5 : 29.25 : ?

a) 15.62
b) 7.02
c) 21
d) 12.65

19) 3,600 : 600 : 100 : 16.66 : ?

a) 1.38
b) 2.38
c) 2.77
d) 3.33

20) 2 : 6.2 : 18.8 : 56.6 : ?

a) 113
b) 75.4
c) 170
d) 62.8

APPENDIX G

SEQUENTIAL NUMBER TEST

GROUP B

Instructions

Circle the letter for the correct answer. I.D. _____

1) 4 : 20 : 100 : 500 : ?

a) 1000
b) 750
c) 2500
d) 10,000

2) 100 : 89.5 : 79 : 68.5 : ?

a) 42.4
b) 58
c) 54
d) 32

3) 30 : 61 : 92 : 123 : ?

a) 398
b) 246
c) 154
d) 130

4) 4 : 7 : 13 : 25 : ?

a) 38
b) 75
c) 125
d) 49

5) 11 : 22 : 33 : 44 : ?

a) 55
b) 88
c) 164
d) 92

Do Not Turn Page until instructed to.

6) 2,500 : 500 : 100 : 20 : ?

a) 2
b) 15
c) 16
d) 4

7) 160 : 190 : 220 : 250 : ?

a) 380
b) 280
c) 500
d) 275

8) 14 : 21 : 28 : 35 : ?

a) 49
b) 36
c) 70
d) 42

9) 1 : 10 : 100 : 1,000 : ?

a) 3,605
b) 10,000
c) 1,010
d) 1,000,000

10) 3 : 7 : 15 : 31 : ?

a) 62
b) 115
c) 60
d) 63

<u>Do Not Turn Page</u> until instructed to.

11) .3 : .6 : .9 : 1.2 : ?

a) 1.5
b) 1.4
c) 1.23
d) 1.75

12) 11 : 24 : 50 : 102 : ?

a) 206
b) 280
c) 200
d) 450

13) 12 : 8 : 4 : 0 : ?

a) .25
b) -2
c) .5
d) -4

14) 100 : 50 : 25 : 12.5 : ?

a) 8
b) 2.5
c) 6.75
d) 6.25

15) 90 : 30 : 10 : 3.33 : ?

a) 2.5
b) 1.11
c) 3
d) .55

Do Not Turn Page until instructed to.

16) 200 : 390 : 770 : 1530 : ?

a) 4590
b) 3660
c) 3025
d) 3050

17) 4 : 10 : 25 : 62.5 : ?

a) 156.25
b) 187.5
c) 87.5
d) 250

18) 220 : 111 : 56.5 : 29.25 : ?

a) 15.62
b) 7.02
c) 21
d) 12.65

19) 3,600 : 600 : 100 : 16.66 : ?

a) 1.38
b) 2.38
c) 2.77
d) 3.33

20) 2 : 6.2 : 18.8 : 56.6 : ?

a) 113
b) 75.4
c) 170
d) 62.8

APPENDIX H

ATTRIBUTIONAL STYLE QUESTIONNAIRE

ATTRIBUTIONAL STYLE QUESTIONNAIRE

DIRECTIONS

ID#_____

1) Read each situation and vividly imagine it happening to you.
2) Decide what you believe would be the major cause of the situation if it happened to you.
3) Write this cause in the blank provided.
4) Answer three questions about the cause, filling in one bubble per question.
5) Go on to the next situation.
6) Write on the answer sheet only. Please do not write on this questionnaire.

SITUATIONS

YOU MEET A FRIEND WHO COMPLIMENTS YOU ON YOUR APPEARANCE.

1) Write down the one major cause.
2) Is the cause of your friend's compliment due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1	2	3	4	5	6	7	Totally due to me

3) In the future when you are with your friend, will this cause again be present?

Will never again be present	1	2	3	4	5	6	7	Will always be present

4) Is the cause something that just affects interacting with friends or does it also influence other areas of your life?

Influences just this particular situation	1	2	3	4	5	6	7	Influences all situations in my life

YOU HAVE BEEN LOOKING FOR A JOB UNSUCCESSFULLY FOR SOME TIME.

5) Write down the one major cause.
6) Is the cause of your unsuccessful job search due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1	2	3	4	5	6	7	Totally due to me

7) In the future when looking for a job, will this cause again be present?

Will never again be present	1	2	3	4	5	6	7	Will always be present

8) Is the cause something that just influences looking for a job or does it also influence other areas of your life?

Influences just this particular situation	1	2	3	4	5	6	7	Influences all situations in my life

YOU BECOME VERY RICH.

9) Write down the one major cause.
10) Is the cause of your becoming rich due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1	2	3	4	5	6	7	Totally due to me

11) In your financial future, will this cause again be present?

Will never again be present	1	2	3	4	5	6	7	Will always be present

12) Is the cause something that just affects obtaining money or does it also influence other areas of your life?

Influences just this particular situation	1	2	3	4	5	6	7	Influences all situations in my life

A FRIEND COMES TO YOU WITH A PROBLEM AND YOU DON'T TRY TO HELP THEM.

13) Write down the one major cause.
14) Is the cause of your not helping your friend due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1	2	3	4	5	6	7	Totally due to me

15) In the future when a friend comes to you with a problem, will this cause again be present?

Will never again be present	1	2	3	4	5	6	7	Will always be present

16) Is the cause something that just affects what happens when a friend comes to you with a problem or does it also influence other areas of your life?

Influences just this particular situation	1	2	3	4	5	6	7	Influences all situations in my life

YOU GIVE AN IMPORTANT TALK IN FRONT OF A GROUP AND THE AUDIENCE REACTS NEGATIVELY.

17) Write down the one major cause.
18) Is the cause of the audience reacting negatively due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1	2	3	4	5	6	7 Totally due to me

19) In the future when giving talks, will this cause again be present?

Will never again be present	1	2	3	4	5	6	7 Will always be present

20) Is the cause something that just influences giving talks or does it also influence other areas of your life?

Influences just this particular situation	1	2	3	4	5	6	7 Influences all situations in my life

YOU DO A PROJECT WHICH IS HIGHLY PRAISED.

21) Write down the one major cause.
22) Is the cause of being praised due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1	2	3	4	5	6	7 Totally due to me

23) In the future when doing a project, will this cause again be present?

Will never again be present	1	2	3	4	5	6	7 Will always be present

24) Is the cause something that just affects doing projects or does it also influence other areas of your life?

Influences just this particular situation	1	2	3	4	5	6	7 Influences all situations in my life

YOU MEET A FRIEND WHO ACTS HOSTILELY TOWARDS YOU.

25) Write down the one major cause.
26) Is the cause of your friend acting hostile due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1	2	3	4	5	6	7 Totally due to me

27) In the future when interacting with friends, will this cause again be present?

Will never again be present	1	2	3	4	5	6	7 Will always be present

28) Is the cause something that just influences interacting with friends or does it also influence other areas of your life?

Influences just this particular situation	1	2	3	4	5	6	7 Influences all situations in my life

YOU CAN'T GET ALL THE WORK DONE THAT OTHERS EXPECT OF YOU

29) Write down the one major cause.
30) Is the cause of your not getting the work done due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1	2	3	4	5	6	7 Totally due to me

31) In the future when doing the work that others expect, will this cause again be present?

Will never again be present	1	2	3	4	5	6	7 Will always be present

32) Is the cause something that just affects doing work that others expect of you or does it also influence other areas of your life?

Influences just this particular situation	1	2	3	4	5	6	7 Influences all situations in my life

YOUR SPOUSE (BOYFRIEND/GIRLFRIEND) HAS BEEN TREATING YOU MORE LOVINGLY.

33) Write down the one major cause.
34) Is the cause of your spouse (boyfriend/girlfriend) treating you more lovingly due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1	2	3	4	5	6	7	Totally due to me

35) In the future interactions with your spouse (boyfriend/girlfriend), will this cause again be present?

Will never again be present	1	2	3	4	5	6	7	Will always be present

36) Is this cause something that just affects how your spouse (boyfriend/girlfriend) treats you or does it also influence other areas of your life?

Influences just this particular situation	1	2	3	4	5	6	7	Influences all situations in my life

YOU APPLY FOR A POSITION THAT YOU WANT VERY BADLY (e.g., IMPORTANT JOB, GRADUATE SCHOOL ADMISSION, etc.) AND YOU GET IT.

37) Write down the one major cause.
38) Is the cause of your getting the position due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1	2	3	4	5	6	7	Totally due to me

39) In the future when applying for a position, will this cause again be present?

Will never again be present	1	2	3	4	5	6	7	Will always be present

40) Is the cause something that just influences applying for a position or does it also influence other areas of your life?

Influences just this particular situation	1	2	3	4	5	6	7	Influences all situations in my life

YOU GO OUT ON A DATE AND IT GOES BADLY.

41) Write down the one major cause.
42) Is the cause of the date going badly due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1	2	3	4	5	6	7	Totally due to me

43) In the future when dating, will this cause again be present?

Will never again be present	1	2	3	4	5	6	7	Will always be present

44) Is the cause something that just influences dating or does it also influence other areas of your life?

Influences just this particular situation	1	2	3	4	5	6	7	Influences all situations in my life

YOU GET A RAISE.

45) Write down the one major cause.
46) Is the cause of your getting a raise due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1	2	3	4	5	6	7	Totally due to me

47) In the future on your job, will this cause again be present?

Will never again be present	1	2	3	4	5	6	7	Will always be present

48) Is this cause something that just affects getting a raise or does it also influence other areas of your life?

Influences just this particular situation	1	2	3	4	5	6	7	Influences all situations in my life

APPENDIX I

STANDARDIZED INSTRUCTIONS (EXPERIMENT)

The test you will be taking on the following pages consists of sequential number problems (i.e. 3, 6, 9, 12, ? - Ans. 15). The object of the problems is to determine the pattern and complete the sequence. There will be four answer selections to choose from, and you circle the answer you feel is correct. A sequence may be composed of a pattern of either addition, subtraction, multiplication, division, or a combination of any two. For example:

Addition

2, 4, 6, 8, ? Answer: 10 Pattern: +2

Subtraction

25, 20, 15, 10, ? Answer: 5 Pattern: -5

Multiplication

4, 8, 16, 32, ? Answer: 64 Pattern: x 2

Division

120, 60, 30, 15, ? Answer: 7.5 Pattern: 1/2

Combination

6, 10, 18, 34, ? Answer: 66 Pattern: x2, -2

There will be five items on each page. This is a timed test. You will have approximately 45 seconds per item (3 minutes and 45 seconds per page). Do not move to the next page until time has been called and you have been instructed to advance to the next page.

VITA

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Master of Science

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