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Attributions as mediators between academic performance and academic self-efficacy

Zilber, Suzanne Marks, Ph.D.
The Ohio State University, 1990
ATTRIBUTIONS AS MEDIATORS
BETWEEN
ACADEMIC PERFORMANCE AND ACADEMIC SELF-EFFICACY

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy in the Graduate
School of the Ohio State University

By

Suzanne Marks Zilber, A.B., M.A.

* * * * *

The Ohio State University
1990

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# LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Frequencies and percentages of race of sample</td>
<td>89</td>
</tr>
<tr>
<td>2. Hierarchical multiple regression for post-test college self-efficacy predicted by attributional dimensions and midterm grade evaluation</td>
<td>90</td>
</tr>
<tr>
<td>3. Means and standard deviations for pre and post course requirements self-efficacy by perceived success and failure groups</td>
<td>91</td>
</tr>
<tr>
<td>4. Means and standard deviations for pre and post college self-efficacy by perceived success and failure groups</td>
<td>92</td>
</tr>
<tr>
<td>5. Correlations among attributional dimensions</td>
<td>93</td>
</tr>
<tr>
<td>6. Means and standard deviations for attributional dimensions by total, perceived success, and failure groups</td>
<td>94</td>
</tr>
<tr>
<td>7. Simultaneous multiple regression for post-test course requirements self-efficacy predicted by attributional dimensions for the perceived success group</td>
<td>95</td>
</tr>
<tr>
<td>8. Simultaneous multiple regression for post-test course requirements self-efficacy predicted by attributional dimensions for the perceived failure group</td>
<td>96</td>
</tr>
<tr>
<td>9. Hierarchical multiple regression for post-test college self-efficacy predicted by attributional dimensions for the perceived success group</td>
<td>97</td>
</tr>
</tbody>
</table>
TABLE
10. Hierarchical multiple regression for post-test college self-efficacy predicted by attributional dimensions for the perceived failure group ........ 98

11. Hierarchical multiple regression for final course grade predicted by attributional dimensions and post-test course requirements self-efficacy .............................. 99

12. Hierarchical multiple regression for final course grade predicted by attributional dimensions and post-test college self-efficacy.. 100
LIST OF FIGURES

FIGURE PAGE

1. The correlation between midterm grade evaluation and actual midterm grade .................. 101
TABLE OF CONTENTS

ACKNOWLEDGEMENTS .................................................. iii
VITA ........................................................................ iv
LIST OF TABLES ......................................................... v
LIST OF FIGURES ......................................................... vii

CHAPTER

I. INTRODUCTION.......................................................... 1

II. LITERATURE REVIEW.................................................. 5
   Self-Efficacy Literature........................................... 5
   Summary of Self-Efficacy Research ...................... 14
   Attributional Literature......................................... 14
   Summary of the Relationship between
   Depression and Attributions............................... 23
   Summary of the Relationship between
   Attributions and Self-Efficacy......................... 35
   Summary of the Relationship between
   Attributions and Achievement Behaviors.............. 39
   General Summary.................................................. 39
   Hypotheses.......................................................... 40

III. METHODOLOGY......................................................... 45
   Participants.......................................................... 45
   Brief Summary of Procedure.............................. 45
   Instruments.......................................................... 46
   Demographic Questionnaire.............................. 46
   Course Requirements Self-Efficacy................. 46
   College Self-Efficacy Scale............................. 47
   Midterm Grade Evaluation................................. 48
   Revised Causal Dimension Scale...................... 49
   Procedure.......................................................... 50
IV. RESULTS .................................................. 52

Attributions as Mediating Variables .......... 53
The Correlation Between Actual Grade and Midterm Grade Evaluation ............ 55
Effects of Midterm Grade Evaluation on Post-test Course and College Self-Efficacy 55
The Effects of Outcome on Attributions ..... 57
Attribution by Outcome Effects on Course Self-Efficacy ................ 58
Attribution by Outcome Effects on College Self-Efficacy ............. 59
The Effects of Globality Attributions on the Correlation Between Course and College Self-Efficacy ............ 61
The Relationship Between Course and College Self-Efficacy With Final Course Grade .... 61
The Relative Contributions of Self-Efficacy and Attributions in Predicting Final Course Grade ............................. 62

V. DISCUSSION ........................................... 64

Attributions as Mediating Variables ....... 65
The Effects of Performance Outcome on Course and College Self-Efficacy ............. 66
Attributional Dimensions' Effect on Self-Efficacy ............................ 67
The Effects of Globality Attributions on the Correlations between Course and College Self-Efficacy ............ 69
Midterm and Final Grade Relationships to Self-Efficacy.......................... 70
The Relative Contributions of Self-Efficacy and Attributions in Predicting Final Course Grade ..................... 70
Limitations ................................................. 71
Implications for Counseling and Teaching .... 72
Future Research ........................................... 73

VI. SUMMARY ........................................... 75

LIST OF REFERENCES ........................................ 82
TABLES AND FIGURES ........................................ 89
APPENDICES

A. Demographic Questionnaire and Release Consent Form........................................ 102
B. Course Self-Efficacy Scale......................... 103
C. College Self-Efficacy Scale....................... 104
D. Midterm Grade Evaluation ......................... 105
E. Revised Causal Dimension Scale.................... 106
F. Debriefing Statement............................... 108
ATTRIBUTIONS AS MEDIATORS
OF THE RELATIONSHIP BETWEEN
ACADEMIC PERFORMANCE AND ACADEMIC SELF-EFFICACY

By

Suzanne Marks Zilber, Ph.D.

The Ohio State University, 1990

Professor Samuel H. Osipow, Adviser

The present study explored the relationship between attributions and self-efficacy expectations for academic performance. Participants were 76 female and 34 male first year students taking introductory psychology. The first week of class, participants completed course and college self-efficacy measures. After the midterm, students reported their grade, their personal evaluation and attributions for that grade, and completed course and college self-efficacy measures. Items to measure globality were added to Russell's (1982) Causal Dimension scale to measure attributions. Final and midterm grades were obtained from office records with students' permission.

The prediction that attributions would mediate the effects of outcome on course requirements and general academic self-efficacy were not supported by the data.
Self-evaluation of success on the midterm was positively related to an increase in course and college self-efficacy, while those experiencing failure did not show a significant decrease in self-efficacies.

The effects of specific attributions on course requirements and college self-efficacy were examined. Attributions to a more stable cause of outcome in the success condition related positively to course self-efficacy. In the case of failure, attributions to a more global cause related negatively to course self-efficacy. The directions of both of these findings are consistent with attribution theory.

More global attributions for success related positively to college self-efficacy. This finding supported the prediction that global attributions to a specific feedback event would generalize the outcome effect to more general self-efficacy expectations. However, global attributions did not significantly contribute to the prediction of self-efficacy in the case of failure and they did not affect correlations between course and college self-efficacy.

As predicted, final grade related positively to both post-test course and college self-efficacies, while having no relationship to pre-test self-efficacies. Post hoc analyses on the prediction of final grade revealed that self-efficacy and attributions are independent and valid predictors of final course grade. This finding suggests
that there may be an independent path between attributions and grade as well as an indirect path to grade via self-efficacy.
CHAPTER I
INTRODUCTION

Research is beginning to establish a relationship between attributions and self-efficacy expectations for academic and career behaviors. A self-efficacy expectation is a belief that one can successfully perform a given task or behavior (Bandura, 1977). Bandura's (1977) theory predicts that self-efficacy determines whether behaviors are attempted or avoided and determine the degree of persistence in the face of barriers to achievement. Self-efficacy expectations are therefore important predictors in examining academic and career behaviors (Lent & Hackett, 1987). Bandura (1977) noted that performance accomplishments (successes or failures) are the most powerful source of information contributing to the development of self-efficacy expectations. He added, however, that the influence of successes or failures on efficacy depends on how they are perceived (i.e. what attributions are made for the outcome). Causal attributions are cognitive explanations for positive and negative outcomes. Attributions can vary along the dimensions of internality, globality, and stability, for example, attributing a failure on a math test to general
lack of intelligence is an internal, global, and stable attribution. Perceived controllability is another important attributional factor (Weiner, 1985).

Research on the relationship between attributions and depression have reliably shown that certain patterns of attribution predict depression (Sweeney, Bailey, & Anderson, 1986). Hackett and Betz (1981) suggested that sex differences in attributional styles may explain differences in self-efficacy expectations for occupations: Women tend to attribute both positive and negative outcomes in a self-depreciating manner, while men tend to attribute outcomes in a self-enhancing or self-serving manner (Campbell, 1985; Deaux & Farris, 1977; Ickes & Layden, 1978). More recent research suggests that most women manifest lower self-efficacy only for traditionally male dominated occupations or tasks, especially those involving math (Post-Kammer & Smith, 1986), so the attributional patterns need to be considered in the various achievement contexts.

Schunk (1981, 1984) has directly investigated and provided support for the relationship between attributions and academic self-efficacy with elementary school children. A sense of academic self-efficacy is important in the success of college students. Lent, Brown, and Larkin (1984, 1986, 1987) found repeatedly that higher academic self-efficacy was related to greater persistence and higher
academic achievement in college students. Research on college students has established a relationship between attributions and self-efficacy expectations, but does not address the question of directionality. Peterson and Barrett (1987) found that attributions influence college level academic achievement, however, the authors do not provide a theoretical explanation for how attributions would have such an effect. Self-efficacy theory may provide an explanation for the relationship between attributions and academic achievement if it can be assumed that attributions contribute to the development of self-efficacy expectations which then influence academic behaviors which in turn influence academic outcomes. A study by Campbell and Hackett (1986) suggested that successes and failures increased and decreased self-efficacy respectively. Zilber's (1988) analog study suggested that attributions contributed to the prediction of self-efficacy expectations beyond the effect of performance outcomes alone. This finding fits Bandura's (1977) theory regarding development of self-efficacy expectations.

It is important to test the attribution/self-efficacy relationship with real performance outcomes as well as in the context of college achievement. Metalsky, Halberstadt, and Abramson (1987) investigated whether task-specific attributions would have a generalized effect on general mood. They found that midterm outcome predicted immediate
affective response, but that at later times, depressive mood reactions were predicted solely by the attribution by outcome interaction. The present study is a variation of the Metalsky et al. (1987) investigation, replacing the dependent variable, depressive mood, with academic self-efficacy. It is similarly designed to test whether attributions for a specific test outcome influence specific self-efficacy as well as generalize to global academic self-efficacy. The study also partially replicates Zilber's (1988) study in the context of academic achievement rather than career fields.

In summary, the present study is designed to investigate whether attributions contribute in a significant way to the development of specific and global academic self-efficacy. More specifically, it questions whether attributions mediate the relationship between outcomes and self-efficacy. A sex effect is not expected because the academic domain, introductory psychology, is not math based nor particularly sex typed. Although some theory and research (Abramson, Metalsky, & Alloy, 1989) suggest that only attributions for negative events are relevant for depression, attributions for positive outcomes are expected to influence self-efficacy expectations.
CHAPTER II
LITERATURE REVIEW

A review of selected literature relevant to the present study is presented in this chapter. The review first examines self-efficacy theory as it relates to academic and career behaviors, then examines the effects of attributions on depression and other behaviors. Finally, literature directly studying the self-efficacy and attribution relationship is examined.

Self-efficacy Literature

Self-efficacy theory. Bandura (1977) postulated that self-efficacy expectations are strong determinants of behavior. Self-efficacy level or magnitude refers to the degree of difficulty of the tasks the individual feels capable of attempting, and consequently influences whether certain behaviors are attempted or avoided. Self-efficacy strength is the person's confidence in his or her capability, and consequently influences the persistence of behavior when disconfirming or dissuading experiences are confronted. Although, level and strength are separated theoretically, Lent and Hackett (1987) suggest that perhaps both are adequately reflected by considering only self-
efficacy strength. Once established, self-efficacy may generalize to similar task areas, so how and when self-efficacy generalizes is another issue for consideration.

According to Bandura (1977), self-efficacy expectations are based on four sources of information: performance accomplishments, vicarious learning, emotional arousal, and verbal persuasion. He proposed that performance accomplishments or "enactive attainments" provide the most influential source of efficacy information because they provide actual mastery information. Successes should raise self-efficacy expectations and failures should lower them. However, the relationship between performance outcomes and self-efficacy is not simple (Bandura, 1986). Outcome's influence on self-efficacy depends on the strength of pre-existing self-perceptions with which the new information will be integrated. In addition, cognitive appraisals of effort expended, causal attributions, and self-monitoring biases are hypothesized to mediate the relationship between performance outcomes and self-efficacy.

Self-efficacy has been found to influence level of performance, task choice, effort, and persistence in many contexts (Bandura, 1986), and choice and persistence in educational and occupational pursuits (Lent & Hackett, 1987). The following will first establish that self-efficacy is an important determinant of academic behavior,
then examine how attributions relate to self-efficacy expectations in academic contexts.

**Academic self-efficacy and persistence and performance.**

**Academic self-efficacy scales and research.** There has been some effort to develop general academic self-efficacy scales and each scale is very different. The scales are reviewed in detail here to clarify choices made in developing a new academic self-efficacy scale for this study and to report research findings associated with the scales.

Wood and Locke (1987) pointed out that developing a general academic scale is difficult because academic performance consists of a complex sequence of interrelated tasks. Another problem is that some researchers fail to make a distinction between outcome expectancies and self-efficacy expectations. An outcome expectancy is the belief that a given behavior will or will not lead to a certain outcome. Self-efficacy, on the other hand, merely represents a belief in the ability to perform some behavior. It can be difficult to write academic self-efficacy measures whose task items are sufficiently difficult to obtain a range of responses; thus, some measures reflect outcome expectancies instead, which creates error in testing self-efficacy theory.

Maddux, Norton, and Stoltenberg (1986) examined the relative effects of self-efficacy expectations, outcome expectancies, and outcome values on behavioral intentions.
Self-efficacy and outcome expectancies have not been properly distinguished operationally in current research. Correlational analyses indicated that self-efficacy and outcome expectations were equivalent, independent, and nonredundant predictors of behavioral intentions.

Brookover, Erickson, and Joiner (1967) developed a Self-Concept of Ability scale which approximates a self-efficacy scale with some items, but some items ask students to compare their abilities to other students, and some items reflect outcome expectancies.

Wood and Locke (1987) developed a 17 item academic self-efficacy scale for college students. Students indicated their confidence for concentrating, memorizing, understanding, explaining concepts, discriminating concepts, and note-taking in terms of percentages (e.g., confidence for being able to memorize 80% of facts and concepts) in a particular course. The way these items were composed could be interpreted as outcome expectancy rather than self-efficacy items, because they indicate amounts of work achieved. This scale was administered with measures of academic ability, grade goals, and course performance. The results suggested that self-efficacy had a significant relationship with academic performance, even when controlling for ability (measured with the Wonderlic Personnel Test). Self-efficacy was also positively related
to higher grade goals which may have resulted in an indirect
effect on performance.

Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, and Rogers (1982) also developed an academic related self-
efficacy scale, but it appears to be a measure of
persistence, a supposed effect of self-efficacy, rather than
perceptions of competence for particular tasks.
Nonetheless, they found that for college students, high
scores of internality on the Internal-External Control Scale
(Rotter, 1966) related positively to high scores on the self-
efficacy measure. Self-efficacy was also moderately related
to self-esteem measured by the Rosenberg (1965) self-esteem
scale. This finding is probably the result of the
generality of the self-efficacy scale, suggesting that this
particular self-efficacy scale has less divergent validity.
With adults in an Veteran's Administration alcohol treatment
center, higher general self-efficacy related to greater past
likelihood of employment, fewer jobs quit, and fewer times
fired in the past. It also correlated positively with
educational level and previous military rank.

Peaco (1983) developed an Academic Self-Efficacy
Expectancy (ASEE) scale to measure self-efficacy for
performing study and classroom behaviors necessary to do
well in college. Items for the scale were derived from
study skills textbooks and have face validity in and of
themselves for academic tasks. Unfortunately, the rating
instructions ask students to indicate their certainty about whether or not they will perform the behaviors, not their confidence in their ability to perform the behaviors. The scale is therefore construct invalid. The ASEE had good inter-item reliability (.91) but had little correlation with final grade.

Academic self-efficacy in context of occupational literature. The following reviews the literature on occupational self-efficacy as it relates to academic self-efficacy.

Lent, Brown, and Larkin (1984) tested the prediction that higher occupational self-efficacy levels and strengths will result in greater academic persistence and achievement. Male and female students enrolled in an institute of science and technology indicated their self-efficacy for the educational and job requirements for fifteen scientific and technical occupations. The results suggest that higher levels of self-efficacy related to greater persistence in technical courses and higher grade point averages for those courses measured one year later. Self-efficacy also related to mathematical aptitude and high school grade point average. The relationship of self-efficacy to past and future achievement suggests a reciprocal relationship. The direction(s) of causality are unclear. No significant sex differences were found, but that may be the result of female self-selection and the homogeneity of the sample.
Lent, Brown, and Larkin (1986) partially replicated their previous study using a self-efficacy measure for "academic milestones", which was focused on more specific academic tasks for science and technical majors (e.g., complete the mathematics requirements for most engineering majors), as well as a measure of self-efficacy for educational requirements and job duties in relation to job titles. A moderate relationship ($r = .52$) between the occupational and the academic milestones measures was found, with each measure relating to different aspects of perceived efficacy. This finding suggests that academic and occupational self-efficacy may be separate constructs depending on how academic self-efficacy is operationalized. As found in Lent et al. (1984), higher self-efficacy expectations predicted higher grade point averages and the number of perceived career options. In addition, Lent et al. (1986) measured self-esteem using the Rosenberg (1965) Self-Esteem Scale and career indecision using the Career Decision Scale (Osipow et al, 1976). They found no gender differences, and no relation between self-efficacy and self-esteem or career indecision. Branch and Lichtenberg (1987) also tested the relationship between self-esteem and self efficacy using the Rosenberg Self-Esteem Scale and found no correlation.

A later study by Lent, Brown, and Larkin (1987) explored the contributions of self-efficacy, interest congruence, and
consequence thinking for predicting: grades and persistence in scientific technical fields, range of perceived career options, and career indecision. Interest congruence derives from Holland's theory and is a measure of the match between an individual's interests and her or his work environment. Consequence thinking, based on theories of Janis and Mann, (1977) describes the prediction of positive and negative consequences for various decisions. Self-efficacy was measured for educational requirements for technical/science fields and academic milestones. Regression analyses indicated that academic self-efficacy was the most useful predictor for grades and retention in technical majors over a 1-year period.

Stumpf, Brief, and Hartman (1987) performed a test of the relationship between self-efficacy and perceived and actual performance. They proposed that self-efficacy expectations would reduce reliance on maladaptive coping behaviors such as emotion-focused coping, which are efforts to regulate stressful emotions, as opposed to problem-focused coping in which energy is directed toward problem solving. A path analysis indicated that respondents with lower self-efficacy reported greater use of emotion-focused behavior. Most important in terms of Bandura's model, it was found that perceived prior performance had a large significant effect on self-efficacy expectations. However, self-efficacy was not related to
actual performance as assessed by the interviewer. Thus, perceived performance is an important contributor to the development of self-efficacy expectations, but there is no evidence that increased self-efficacy expectations would contribute to a better interview performance.

Sex differences have been a major focus of the occupational self-efficacy literature, as investigators have attempted to explain women's underrepresentation in male-dominated occupations, as well as women's underutilization of their abilities in career pursuits (Hackett & Betz, 1981). It is possible that the traditionality or gender predominance distinction is not as important as the math/nonmath occupation distinction (Betz & Hackett, 1984). Post-Kammer and Smith (1986) studied the relationship between interests, self-efficacy, and careers considered by disadvantaged high school males and females. They found that for women, consideration of math involves confidence and interest factors, but that for males interest is the only predictor. For nonmath careers, interest was the strongest predictor for both sexes, but again self-efficacy entered into the prediction for females. Sex differences were found for only 3 out of 24 occupations and they were both math-oriented and traditionally male (computer programmer, drafter, engineer).

The occupational self-efficacy literature has grown since the Hackett & Betz (1981) application of self-efficacy
theory to occupational choice. This literature establishes that academic self-efficacy, represented by self-efficacy for educational requirements, may have important implications for career options.

**Summary of self-efficacy research.** To summarize the occupational and academic self-efficacy literature thus far, five studies support the assumption that self-efficacy predicts success and persistence in academic and career pursuits (Lent et al., 1984, 1986, 1987; Sherer et al., 1987; Wood & Locke, 1987). Two studies compared self-efficacy to other variables or models and found that self-efficacy was a better or equal predictor for careers considered (Maddux et al., 1986), or grades and persistence (Lent et al., 1987). The causal directions between self-efficacy, prior performance, and future achievement remain unclear, although a positive relationship was found between self-efficacy and prior performance (Lent et al., 1984; Stumpf et al., 1987). Overall, it appears that self-efficacy is an important predictor of performance and persistence in college for both women and men.

**Attributional Literature**

As stated earlier, Bandura (1977) noted that accomplishments are the most powerful source of efficacy information. However, those accomplishments must be perceived as earned and valid successes to contribute positively to self-efficacy. In addition, it is expected
that the way failures are perceived will determine changes in self-efficacy. The depression/attribution relationship literature is reviewed here to define the attribution construct and because that research has more extensively examined the effects of specific types of attributions.

**Attribution theory.** Abramson, Seligman, and Teasdale (1981) reformulated the learned helplessness model in terms of attributions and related attributional styles to depression. They proposed that when people experience what appear to be uncontrollable outcomes, whether positive or negative, they attribute their helplessness to some cause. The chosen cause may differ on the dimensions of stability, internality, and globality. Which cause is chosen then influences how chronic and how generalized expectations of future helplessness will be and whether self-esteem will be lowered. For example, attributions would therefore determine the incidence, chronicity, and generality of the depression. The reformulated learned helplessness theory was further refined to suggest that attributional styles create levels of vulnerability to depression in the face of negative life events. Depression, therefore, does not create the attributions; rather, attributions predispose people for depression. The latter theoretical addition is called the diathesis-stress component of the reformulated theory of depression (Metalsky, Halberstadt, & Abramson, 1987).
An integration of the attribution and self-efficacy theories is possible because Abramson et al. (1981) claimed that depression is made up of four types of deficits: motivational, cognitive, self-esteem, and affective. Low self-efficacy may be considered a motivational deficit for academic behaviors, since low expectations for being successful in coursework would cause avoidance of it. In addition, Abramson et al. predict that the intensity of the deficits will depend on the strength of perceived uncontrollability. Therefore, attributions and perceptions of controllability may influence the occurrence and severity of motivational deficits in academic behavior, in the form of high or low self-efficacy expectations.

Development of attributional styles. Hackett and Betz (1981) suggested that sex differences in attributions for success and failure may contribute to sex differences in self-efficacy. Analyses of sex differences are not performed in the present study, because sex differences are not expected, given that the domain of achievement used is not male typed, but a review of the research on sex differences illuminates how attributional styles develop.

Dweck and Goetz (1978) observed that when girls failed in the classroom, teachers gave them feedback suggesting that failure was due to intellectual inadequacy, whereas boys received feedback suggesting that something
about their conduct or nonintellectual aspects of their work caused their failure.

Deaux and Farris (1977) studied gender differences in attributions and interpreted their results in terms of a general expectancy model. They manipulated subjects' impressions of whether males or females performed better on a "sex-neutral task" and manipulated task outcome by the varying the difficulty of two different anagram tasks. They found that despite equal performance on the task, college women attributed both success and failure more to luck than other causes, such as effort or task ease, while college men more often made attributions to high ability, even after failure outcomes. The female subjects also attributed failure to low ability more often than males. With regard to the sex-norm manipulation, Deaux and Farris's findings parallel those of Betz and Hackett's (1981) findings: women manifested lower success expectancies and self-evaluations in the masculine normed task condition, while men manifested equal expectancies and evaluations for both conditions. This finding suggests that once attributional styles are established, sex-typed expectancies may trigger certain types of attributions.

A study by Ryckman and Peckman (1987) suggested that attributional styles may differ according to sex-typing of tasks and change from grade school to high school. They administered the Survey of Achievement Responsibility (SOAR)
to 4th through 11th graders. The SOAR consists of eight success and eight failure items each for three achievement categories: Math/Science, Language Arts, and Physical Education. They found that girls attributed failure at math achievement more to ability, a self-depreciating attribution, but not for language arts achievement. Boys attributions were self-enhancing for both academic areas, i.e., their attributions that ability caused their outcomes were higher with success than with failure. In addition, it appears that attributional styles for language arts became more self-enhancing as students reached high school, while attributions for math became self-depreciating for both boys and girls.

Burns and Seligman (1989) found that explanatory style for negative events was stable throughout adult life. They reviewed the diaries and letters and current responses to an attributional measure of 30 subjects averaging 72 years old. There was no stability of explanatory styles for positive events. However, the small sample size requires that the conclusions be tentative for positive events because there may not have been enough statistical power to detect a smaller effect. Nonetheless, the findings suggest that attributional styles are enduring and that interventions aimed at changing attributions for negative events may need to be repeated over time in different situations to be most powerful.
Empirical studies. Sweeney, Anderson, and Bailey (1986) performed a meta-analysis using 104 studies on the relation of attributional styles to depression. The studies chosen for inclusion employed two main methodological approaches to measuring attributional style. The results were computed separately according to method because the different procedures can produce significantly different effects. The approaches were (1) to measure attributional dimensions (e.g., internality, stability, globality) which included approximately 90 studies; or (2) to measure attributional factors (e.g., ability, effort, task difficulty, luck), which included approximately 28 studies. Internality refers to an attribution to internal or external causes. Stability refers to an attribution to stable or unstable causes. Globality refers to whether the attribution includes causes specific to the outcome or causes that could contribute to many outcomes. Regarding attributional factors, attributions to ability are internal and stable; to effort, internal and unstable; to task difficulty, external and stable; and to luck, external and unstable.

With the dimensional method, the authors found that for negative events, attributions to internal, stable, and global causes were reliably and significantly associated with depression. For positive events, attributions to external, unstable, and specific causes were associated with
depression. With the factor method, attributions to ability and luck were the strongest predictors of depression for both negative and positive effects, in the directions consistent with the dimensional findings. Overall, for both types of studies the associations between attributions and depression were stronger in response to negative events. Sweeney et al. also noted that the effect sizes were the same regardless of whether students, non-college-student depressive, or psychiatric depressives were used and regardless of whether the type of outcome was hypothetical, experimental, or real life.

Weiner (1985) suggested that controllability attributions are reliable and meaningful predictors of depression. Controllability refers to whether the cause is modifiable and controllable in the future. Anderson and Arnoult (1985) reported that both depressed females and males tend to attribute their successes to external, unstable, and uncontrollable causes, and their failures to internal, stable, and uncontrollable causes, while those not depressed exhibit the reverse pattern. These two different patterns are called self-deprecating and self-enhancing styles, respectively. Other terms given in the past for self-enhancing styles are hedonic bias, self-serving bias, and nondepressogenic style. For the self-deprecating style, the term depressogenic has been used.
The globality dimension is important to consider for self-efficacy development. Mikulincer (1986) addressed the issue of global attributions and generalization of deficits stating that:

If a person decides that failure is due to factors present in a wide range of situations (global), performance deficits tend to recur in dissimilar settings. That is global attributions imply that the expectation of uncontrollability is generalized widely across situations. By contrast, if failure is explained by factors specific to the unsolvable problems, neither the expectation of uncontrollability nor performance deficits tend to be recorded in dissimilar situations (p. 1248).

In order to lend support to the latter statement, Mikulincer trained participants with one cognitive discrimination problem then tested them for deficits with a different type of cognitive task. He divided participants into groups which received no performance feedback, solvable problems and positive feedback, or unsolvable problems and negative feedback, then he gave attributional instructions to subgroups of the negative feedback group. He found that both global and stable attributions are required to generalize expectations of uncontrollability to a different test situation. Other results indicated that only global attributions independently contributed to dissimilar task
performance deficits. Other independent attributional dimensions did not mediate task performance, but combinations of global and internal or global and stable attributions did. This finding suggests that global attributions would contribute to an individual's general self-efficacy, even if given outcome feedback on one specific task.

Metalsky, Halberstadt, and Ambramson (1987) investigated whether task-specific attributions for stability and globality would have a generalized effect on mood. They found that midterm outcome alone predicted immediate affective response, but that at later times, depressive mood reactions were predicted solely by the attribution by outcome interaction. The results, similar to Mikulincer's, suggest that even particular attributions, i.e., in response to one test, can have effects on enduring mood, but the authors hypothesize that people may also have some situation-specific attributional styles.

Mukilincer (1986) also found that expectations for control alone was a strong predictor of performance deficits. This finding lends more support for the centrality of perceptions of controllability in predicting learned helplessness performance deficits. In contrast, Follette and Jacobson (1987) found that students who made internal, stable, and global attributions for poor midterm
exam grades made more plans to study for the next exam, when the reformulated model would predict motivational deficits. However, plans to study do not represent what the students eventually did, so the effects of those attributions on performance are not determined in that study. Overall, the effects of different attributional dimensions on motivational deficits and self-efficacy deserves further study.

Summary of the relationship between depression and attributions.

Attributional styles may develop as a function of verbal feedback, sex typing of tasks, age, and one study found them to be stable over a life span. Studies have consistently shown that particular attributions along the dimensions of internality, stability, globality, and controllability predict the onset and generality of depression in the face of negative events. Research on which attributional dimensions are most powerful in determining affective reactions has produced mixed results.

Methodological issues. Attributional measures from depression research can be applied to self-efficacy, but some theoretical differences in predicting depression and self-efficacy make some measures unusable, because they only ask for reactions to negative events. As stated earlier, success experiences are important in the development of self-efficacy.
It has been hypothesized and empirically supported that people will generate more attributions after an unexpected event, and negative outcomes are generally less expected (Schoeneman, Van Uchelen, Stonebrink, & Cheek, 1986; Sweeney et al., 1986). However, Follette and Jacobson (1987) did not find support for the prediction that unexpected negative events lead to more participant attributions. In fact, only 31% of participants responded with attributions following an indirect probe for any thoughts or feelings. This finding is related to the issue of attribution prompting methodology.

Some researchers are concerned that participants are merely indicating a response to measures because they are asked to, not because people are naturally making causal attributions. However Elig and Frieze (1979) found that responses to unipolar attributional factors (e.g., effort) were more reliable and valid than open-ended attributions.

For the above reasons, an attributional measure developed by Russell (1982) was the most appropriate choice for the present study, because it was could be used for both negative and positive events, while most measures only measure for negative events. He designed the measure to correct the "fundamental attribution research error" which occurs when attributions made by the subject are translated by the researcher into causal dimensions. It is used for a specific event, rather than hypothesized events, as in the
Attributional Style Questionnaire (Peterson, Semmel, von Baeyer, Abramson, Metalsky, & Seligman, 1982). The Causal Dimension Scale (CDS) asks participants an open-ended question about the cause of a particular outcome, then elicits perceptions of that cause on the dimensions of internality, stability, and controllability on three semantic differential scales for each dimension. Consequently, rather than theoretically assuming that task difficulty means an external and stable attribution, the subjects indicate their perceptions. Russell (1982) reported that the measure had good inter-item reliability, except for the control scale which correlated too highly with the locus of causality scale, so he rewrote the control scale. Nonetheless, Vallerand and Richer (1988) and Schaufeli (1988) noted confounds between internality and controllability with the revised version as well.

Russell, McAuley, and Tarico (1987) studied the reliability and validity of the Causal Dimension Scale (CDS; Russel, 1982) in comparison to importance ratings and open-ended attributions. The investigators found support for the use of their methodology over measurement procedures that use the theoretical meaning of causal attributions and over the two other methodologies in the study. In addition they found that internality and controllability attributions were associated with affective reactions to outcomes with the CDS.
Somewhat similar to the CDS is Metalsky, Halberstadt, and Abramson's (1987) Particular Attributions Questionnaire (PAQ). It was designed to obtain attributions about a midterm grade in a college psychology course. It measures internality, stability, and globality, as well as perceptions of grade importance. In their analyses, however, they only used a combined score of stability and globality. The combined score had an inter-item reliability coefficient alpha of .84. Unfortunately, reliability on the individual scales is unavailable. It is also unfortunate that no measure has all four possible dimensions of internality, stability, globality, and controllability, so the measure used in this study adds the globality dimension to Russell's CDS.

**Research on the Relationship Between Attributions and Self-Efficacy**

Overall, the literature is confusing because the direction of causality between attributions and self-efficacy expectations is unclear. Self-efficacy theory suggests that attributions would contribute to the development of self-efficacy expectations, while some other theorists have suggested that attributions are influenced by expectations for success and failure, motivation to protect or enhance one's self-esteem, focus of attention, salience of a potential causal factor, and self-presentational concerns (Abramson, Metalsky & Alloy, 1989). It is possible
that reciprocal influences occur, but that the degrees of influence may differ. Another source of confusion is that attribution theorists suggest that attributions are creating effects that self-efficacy theorists claim are created by self-efficacy, such as persistence and improved performance (e.g., Peterson & Barrett, 1987; Wilson & Linville, 1982, 1985).

**Academic self-efficacy and attributions**

Weiner (1986) reviewed a number of studies done in the 1970's that manipulated success and failure on some task and measured or manipulated attributions. Overall, attributions to stable causes influenced expectancy ratings while attributions to unstable causes did not. He proposed that stability is a more powerful attributional dimension for predicting expectancy change than internality. Weiner (1985) cited empirical evidence which revealed that persistence in the face of failure was enhanced when attributions to low ability were changed to attributions to lack of effort (Andrews & Debus, 1978; Chapin & Dyck, 1976; Dweck, 1975; Zoeller, Mahoney, & Weiner, 1983), or to poor strategy (Anderson, 1983; Anderson & Jennings, 1980). Similarly, Bandura's model proposes that self-efficacy strength increases persistence in the face of failure, thus attributions may influence self-efficacy, which then influences persistence in the face of failure.
McMahan (1973) provided an early test of the relationship between performance expectancies (operationalized the same as efficacy expectations) and attributional factors. However, his approach assumed that the confirmation or disconfirmation of expectancies would influence the attributions as well as assuming that attributions would affect self-efficacy expectations. Looking at disconfirmation of expectancies is a departure from only looking at reactions to negative events as much of the current depression and attributional literature does. Some researchers suggest that negative events are more likely to be unexpected and so will represent more of a disconfirmation (Sweeney et al., 1986). Sixth grade, tenth grade and college students completed anagram tasks, indicated their expectancy to get them correct and received feedback on their performance, after which they made attributions for their outcomes. There were no significant sex differences. Expectancy disconfirmation because of failure for those with high expectancies on the task resulted in the expected self-appreciating style of emphasizing effort and luck, both unstable factors. More interesting is the finding that those with low expectancies for success did not vary in the degree they attributed outcomes to effort or luck according to outcome. They did however attribute failure to their ability more than they did their success. These findings suggest that students
with low performance expectancies may attribute both success and failure outcomes in ways that do not enhance expectancies.

Schunk has conducted a great deal of research on the relationship between attributions and achievement self-efficacy with elementary school students. Schunk & Gunn (1986) taught 50 nine and ten year olds task strategies for performing division problems and examined the effects of training on self-efficacy as well as the influence of attributions on self-efficacy and both on skill. Attributional factors (ability, effort, task difficulty and luck) were used. Attributions to high ability and less to luck were positively related to higher self-efficacy for division problems. Effort was negatively related to self-efficacy, consistent with Weiner's (1986) theory. However, of the attributional factors, effort had the strongest direct relationship to skill improvement, possibly due to students reporting their persistence which would relate to skill. Higher self-efficacy and use of task strategies directly related to children's division skills. This latter result indicates the importance of increasing actual skills as well as changing attributions to enhance self-efficacy.

Schunk and Rice (1986) specifically examined the relative effects of effort and ability attributions on self-efficacy for reading comprehension. Forty 4th and 5th grade students in remedial reading classes received feedback on
reading comprehension. There were four groups in which students received either ability or effort attributions over two time periods (ability-ability, ability-effort, effort-effort, effort-ability) to examine the effects of attributional sequence. Children who received ability feedback for the second half of training developed higher ability attributions and self-efficacy than those who received effort feedback over the same period. The sequence of attributional feedback, did not, however, differentially affect skill development.

Campbell and Hackett have performed a series of studies relating success and failure outcomes to task self-efficacy and attributions. Campbell (1985) and Campbell and Hackett (1986) focused on the effects of success or failure on task self-efficacy strength and level and the relation between interests and self-efficacy. They were also interested in sex differences, so deliberately chose a sex linked (math oriented) task, giving male and female undergraduates a number series task for the success and failure manipulation. Task outcome influenced self-efficacy strength and level, with failure leading to lowered self-efficacy and task interest and success leading to increased self-efficacy and task interest. Women's self-efficacy scores were more extreme than men's in response to both success and failure. Women, more often than men, tended to attribute their success to luck and their failure to lack of ability. In
addition, women perceived their degree of success lower than the men perceived theirs, and women who failed were more dissatisfied with their failure than men who failed.

Hackett and Campbell (1987) replicated their 1986 study using a "gender-neutral" task, anagrams, and assessed sex differences. They also had participants indicate perceptions of global math and verbal ability after the performance feedback. Both global ability scores were affected by outcome, which lends support to a conceptualization of self-efficacy as a general rather than task specific construct. The same performance outcome main effect was found for self-efficacy and interest as found by Hackett and Campbell (1986). Few sex differences were found, indicating that sex linkage of tasks can significantly influence sex differences in self-efficacy. Similar to Campbell (1985), there were main effects for outcome on attributions. Sex differences in attributions were also reported: women experiencing success attributed their performance to luck more than men, and women experiencing failure attributed their performance more to lack of ability than men. Thus, women manifest the self-depreciating attributional style, yet no sex differences in self-efficacy were found. This finding puts the hypothesized relationship between self-efficacy and attributions into question.
The relationship was not, however, fully tested in the Hackett and Campbell (1986) study. Given that outcomes had an effect on self-efficacy expectations, Zilber (1988) investigated whether attributions mediated the effects of outcomes on self-efficacy expectations. She used a gender neutral color discrimination task and told research participants that the task measured creativity for job selection purposes. Only failure resulted in a change in task self-efficacy. In a hierarchical regression, attributions accounted for a large proportion of the variance in self-efficacy, but outcome still contributed significantly to self-efficacy after the attributonal factors were included. Nonetheless, the contribution of outcome was decreased in half. Therefore, a partial mediator effect was assumed. Zilber also found that ability attributions predicted scores on an overall occupational self-efficacy measure. Unfortunately, globality attributions were not measured, so that the effects of globality attributions on the generalization of task efficacy to occupational self-efficacy could not be assessed.

Zilber (1988) also examined sex differences in self-efficacy and attributions. Her findings may illuminate the Hackett and Campbell (1987) finding. Like Hackett and Campbell (1987) she found that women and men exhibited similar self-efficacy, however regression analyses suggested that less stable attributions contributed to women's self-
efficacy, i.e., women were more likely to attribute success to the task being easy, while men attributed it to high ability. Women experiencing failure manifest higher self-efficacy if they attributed higher controllability to themselves, while for men, attributions to higher controllability and higher ability contributed to higher self-efficacy.

Smith (1989) attempted to enhance college student's general self-efficacy expectations with cognitive-behavioral coping skills training. He aimed at changing general efficacy by teaching skills that have wide application. The coping skills intervention had a significant effect on self-efficacy, but not on locus of control measured by Rotter's (1966) scale. Gains in self-efficacy were significantly related to decreases in test anxiety and trait anxiety, but they did not significantly relate to grades for the following quarter. He did not control for ability, so it is unclear if there would have been an ability by training interaction effect. Given that the change scores in self-efficacy and locus of control were independent of each other, Smith suggested the possibility that psychological processes underlying changes in the two variables are differentially engaged. He also noted that more work is needed to identify factors that increase generality of expectancies.
Relich, Debus, and Walker (1986) performed a study to examine the mediating functions of attributional and self-efficacy variables on achievement outcomes for skill training treatments offered in conjunction with attributional feedback. Sixth grade students who received attributional feedback and modeling on division problems displayed greater achievement on a division post-test than the students receiving only modeling, self-instructional practice or no treatment. This finding supports the value of including attributional interventions with other interventions.

More importantly for testing the integration of self-efficacy and attribution theories, these authors performed path analyses and compared path models resulting from comparing the control group with (1) the skill and attribution trained group and (2) the skill trained only group. With the first group, the treatment had a direct effect on division achievement, while attributions had a direct effect on self-efficacy, which then directly influenced division achievement. Therefore, attributions had indirect effects on division achievement mediated by self-efficacy. In contrast, in the skill training only group, the variance in attributions was less than in the attribution trained groups and only treatment related significantly and directly to division achievement. These contrasting findings suggest that the effects of self-
efficacy and attribution on achievement depends on the inclusion of attributional guidance in the learning context.

Summary of relationship between attributions and self-efficacy.

The research on the relationship between attributions and self-efficacy supports many possible relationships between the two variables. One study suggested that students with low expectancies or efficacy exhibited self-depreciating attributions (McMahan, 1973). Three studies established that outcomes influenced changes in self-efficacy for tasks (Campbell & Hackett, 1986; Hackett & Campbell, 1987; Zilber, 1988). These same studies illustrated the importance of sex typing of task for predicting sex differences in self-efficacy, but not necessarily for attributions, although the attribution literature suggested sex typing of task was important for attributions as well. One study indicated that attributions may mediate the effects of outcomes on self-efficacy (Zilber, 1988). Two studies suggested that self-enhancing attributions increased self-efficacy, but self-efficacy did not relate to skill improvement or grades (Schunk & Rice, 1986; Smith, 1989) while two studies did find a path from attributions to self-efficacy to performance (Relich et al., 1986; Schunk & Gunn, 1986). In conclusion, it appears that the type of task and prior expectations may influence
attributions, which may then influence self-efficacy, which may then influence persistence and possibly performance.

**Attributions and academic performance.** Research has also focused on the effects of attributions on performance outcomes, attrition, and academic intentions. Covington and Omelich (1979) pointed out that students may avoid putting effort into work, because in their study, college students who experienced failure had greater negative affective reactions and inability attributions after putting forth much effort. A student with low self-efficacy may therefore show less persistence and effort in order to avoid confronting their perceived inability.

Seligman and Schulman (1986) administered the Attributional Style Questionnaire (ASQ; Peterson, Semmel, & von Baeyer, 1982) to insurance agents in a prospective study. The ASQ measures attributions for 12 items representing positive and negative achievement and affiliative events. They found that those agents with more optimistic or self-appreciating attributional styles for both positive and negative events remained employed at twice the rate and sold more insurance than those with pessimistic styles.

Peterson and Barrett (1987) measured college student's attributional styles with an academic attributional style measure similar to the ASQ consisting of 12 negative academic events. Students who explained bad academic events
with internal, stable, and global causes received lower freshman year grades than students who used external, unstable, and specific causes. Peterson and Barrett suggest that attributions would affect persistence in the face of difficulties, which would affect grades. An alternative explanation would be that attributions affected self-efficacy expectations which are already theoretically proposed to influence persistence. However, they found that students' outcome expectancies for goals had no significant effect on grade point average. Meanwhile, students with a negative explanatory style were significantly less likely to have specific academic goals and less likely to make use of academic advising, so the mechanisms through which attributions affect grades is unclear, as it is unclear how attributions would affect goal setting specificity and help seeking. The authors suggested that operationalizing the constructs better may clarify future research.

Pancer (1978) found that students who received a C or lower in an introductory course were significantly less likely to intend to take future psychology courses when they attributed that outcome to ability, rather than lack of effort. Those students making attributions to effort had intention levels similar to those who achieved A's.

Wilson and Linville (1982, 1985) conducted three studies (two studies are reported in the 1985 paper) which suggested that changing first year student's attributions
about low grades to unstable or temporary causes would improve retention, short term performance, and grades. One group of students received written information and statistics stating that many students' grades improved after freshman year and were showed a videotape of older students saying their grades improved over time. The control group also saw a tape about adjusting to college with no mention of grades. Since the "attribution" manipulation could also be construed to be an expectancy manipulation, it is difficult to interpret the findings as supporting attributional theory as opposed to self-efficacy theory. The short term performance task was a sample Graduate Record Exam. They did not provide a theoretical explanation why they would expect a videotape on grade improvement would affect actual performance on an academic test. Block and Lanning (1984) criticized the Wilson and Linville (1982) report because the students who left the university in the control group actually had better grades than those in the experimental group.

Subsequently, Wilson & Linville (1985) found similar results with improved designs, but that the videotape manipulation had a stronger effect on males than females on short term performance (GRE sample) and subsequent grades. They attributed this result to females' greater tendency to self disclose and consequently receive reassurances similar to the video's when they experience academic difficulty.
Summary of the relationship between attributions and achievement behaviors.

The results of the studies of the relationship between attributions and achievement behaviors are often not based on reliable measures or valid procedures, so it is difficult to draw conclusions. One study clearly related attributions to persistence (Pancer, 1978). Another study suggested that effort expenditure may influence attributions in the face of failure in such a way as to motivate less effort expenditure (Covington & Omelich, 1979). One study found attributions to be related to employment success (Seligman & Schulman, 1986). Three studies of questionable design (Peterson & Barrett, 1987; Wilson & Linville, 1982, 1985) and one basically good study (Pancer, 1978) found that attributions were related to college grades and retention.

General Summary

Research has supported both self-efficacy and reformulated learned helplessness theories. Major findings indicate that (1) Academic self-efficacy relates consistently to greater persistence and there is mixed data on its relationship to achievement (Lent et al., 1984, 1986, 1987; Sherer et al., 1987; Wood & Locke, 1987). (2) Certain attributions relate consistently to depression (Sweeney et al., 1986). (3) Self-appreciating attributions increased academic self-efficacy expectations (Schunk & Rice, 1986; Smith, 1989; Zilber, 1988).
Campbell and Hackett (1986) established that performance accomplishments (i.e. success and failure experiences) are an important source of information contributing to the development of self-efficacy expectations. They found that successes lead to increases in self-efficacy strength and failures lead to decreases in self-efficacy strength.

Some studies have found that attributions for performance outcomes mediate the relationship between outcomes and self-efficacy (Relich et al., 1986; Schunk & Gunn, 1986; Zilber, 1988).

The purpose of the current study is to partially replicate the Zilber (1988) study in the context of college level academic self-efficacy and performance. The study will investigate whether attributions contribute to the prediction of self-efficacy in addition to or beyond the influence of outcome experiences alone. This study will also exam whether "globality" attributions on a course midterm will influence strength of generalized academic self-efficacy.

Hypotheses

Introduction to hypotheses.

The following 13 hypotheses are written as specific predictions about specific effects. To summarize the hypotheses in more general terms, there are 5 categories of hypotheses. The main focus of the study is on Hypotheses 1
and 2, which predict that attributions mediate the effects of grade outcome on self-efficacy. Hypotheses 1 and 2 will be tested only if outcome effects on self-efficacy are found. Therefore, as preconditions for testing the primary hypotheses, Hypotheses 3 and 4 predict outcome effects on course requirements and college self-efficacy.

Hypotheses 5, 6, 7 and 8 serve to explore the way that attributions may mediate the relationship between grade outcome and self-efficacy. They predict attribution by outcome effects on self-efficacy expectations. More specifically, it is predicted that self-enhancing attributions correlate positively with course requirements self-efficacy and with college self-efficacy.

Hypotheses 9 and 10 predict that more global attributions to a specific grade will increase the effect of grade outcome on generalized academic self-efficacy. Hypotheses 11 and 12 predict that college and course requirements self-efficacy expectations will relate to final course grade. Hypothesis 13 predicts that the correlation between course and college self-efficacy will be higher for students with higher globality attributions.

The hypotheses with data analysis procedures.

Hypotheses 1 and 2 predict that attributions mediate the effects of perceived midterm grade outcome on self-efficacy. Hypotheses 1 and 2 will be tested only if outcome effects on self-efficacy are found.
1) The proportion of variance in course requirements self-efficacy accounted for by midterm grade outcome will be greatly reduced by the entry of attributions first into a hierarchical regression analysis, i.e. attributions will mediate the effect of outcome on self-efficacy.

2) The proportion of variance in college self-efficacy accounted for by midterm grade outcome will be greatly reduced by the entry of attributions first into a hierarchical regression analysis.

Hypotheses 1 and 2 will be tested using a hierarchical regression entering the attributional dimensions before the outcome variables, if outcome effects on the two types of self-efficacy are found.

Hypotheses 3 and 4 predict perceived grade outcome effects on course requirements and college self-efficacy.

3) A higher degree of midterm success correlates positively with an increase in course requirements self-efficacy.

4) A higher degree of midterm success correlates positively with an increase in college self-efficacy.

Hypotheses 3 and 4 will be tested using regression.

Hypotheses 5, 6, 7 and 8 predict attribution by outcome interaction effects on self-efficacy expectations. It is predicted that self-enhancing attributions correlate positively with course requirements self-efficacy and with college self-efficacy.
5) Internal, stable, controllable, and global attributions for those indicating a successful midterm grade relate positively to course requirements self-efficacy.

6) External, unstable, controllable, and specific attributions for those indicating a failing midterm grade relate positively to course requirement self-efficacy.

7) Internal, stable, controllable, and global attributions for those indicating a successful midterm grade relate positively to college self-efficacy.

8) External, unstable, controllable, and specific attributions for those indicating a failing midterm grade relate positively to college self-efficacy.

Hypotheses 5, 6, 7 and 8 will be tested using simultaneous multiple regressions by perceived outcome group.

Hypotheses 9 and 10 predict that attributions to a specific grade relate to generalized college self-efficacy under certain conditions.

9) "In the success condition", attributions to greater globality for the midterm grade relates positively to greater post-test college self-efficacy.

10) In the "failure" condition, attribution to lesser globality for the midterm grades relates positively to greater post-test college self-efficacy.

Hypotheses 9 and 10 will be tested using hierarchical regressions, entering globality first as an independent
variable, then the other attributional dimensions, and with college self-efficacy as the dependent variable. This analysis will allow assessment of the relative power of the globality dimension to predict generalizing of outcome effects to generalized self-efficacy.

Hypotheses 11 and 12 predict that college and course requirements self-efficacy expectations will relate to final course grade.

11) Course requirements self-efficacy relates positively to final course grade.

12) College self-efficacy relates positively to final course grade.

Hypothesis 11 and 12 will be tested using zero order correlations.

Hypothesis 13 predicts that the correlation between course and college self-efficacy will be higher for students with higher globality attributions.

13) The correlation between college and course requirements self-efficacy will be increased for students with greater globality attributions for either outcome.

Hypothesis 13 will be tested by comparing regression coefficients from groups high and low on the dimension of globality.
Participants

Participants were 76 female and 34 male first-year students taking an introductory psychology class in their first quarter of enrollment at a large midwestern university. The pre-screening verbal instructions and the sign up sheets for the experimental session explicitly stated that only first-year students should sign up. As planned, more students participated (n=221) in the pre-screening than in the experimental session, to account for participants unable or uninterested in attending the second experimental session.

Brief Summary of Procedure

Participants were informed that their participation in the pre-screening is voluntary and that participation in the second part would require release of their final course grade. They then indicated their social security number and completed course and college self-efficacy measures. Responses were recorded on "scantron" sheets. One or two days after the first midterm, which was approximately 3 weeks after the pre-test, students reported to one of
several scheduled times to report their midterm grade, their personal evaluation and attributions for that grade, and course and college self-efficacy measures. Unfortunately, not enough students showed up for the sessions the few days after their feedback, so about 19 students completed their post-test measures a week after feedback. Final course grades were obtained from the introductory psychology office records. Midterm grades self-reported on response sheets were not usable for analyses due to confusion about the coding system, so they were obtained from the office records as well.

**Instruments**

**Demographic Questionnaire.** This survey asks for participant sex, race, and birth date. It also requests the full social security number for purposes of identification between the two time testings and for obtaining course grades at the end of the quarter. Students indicated on the questionnaire their consent for the psychology 100 office releasing their grade information. This requirement was also noted on the sign up sheet (see Appendix A).

**Course Requirements Self-Efficacy (CRSE).** This 6 item scale was developed by the investigator to assess self-efficacy strength for tasks required by the introductory psychology course participants would be taking (see Appendix B). Students indicate their confidence in their abilities to complete the tasks on a ten point Likert-type scale (0 =
no confidence, 9 = complete confidence). The measure could generally apply to any reading and lecture based course, so students will be instructed to express their confidence levels for the particular psychology course. The initial scale had 9 items, 3 of which were eliminated with item-total correlations less than \( r_{pb} = 0.25 \), tested on a sample of 36 students. The coefficient alpha for the 6 item scale based on the current sample is 0.82 \((n=216)\). Test-retest reliability over 3 weeks was 0.66 \((n=108)\). The scale mean on the pre-test was 38.43 with a standard deviation of 7.71 \((n=216)\).

**College Self-Efficacy Scale (CSES).** This 16 item scale was developed by the investigator to get a general academic self-efficacy strength score for college work (see Appendix C). It was decided to develop an academic self-efficacy scale, because the measures available for the author's review had inadequate face and construct validity (Brookover et al., 1967; Peaco, 1983; Sherer et al., 1982; Wood & Locke, 1987). Items were generated by the investigator who is a former instructor of a study skills course. College students in a study skills course who had been given a lecture on the concept of academic self-efficacy expectations also contributed items. Items represent academic tasks perceived as challenging by students, and social aspects of college survival were left out. Students indicate their confidence in their abilities to complete the
tasks on a ten point Likert-type scale (0 = no confidence, 9 = complete confidence). Reliability data on the measure was collected in a pilot study with 108 students. The initial scale had 27 items. Four items were eliminated for having item-total correlations less below $r_{pb} = .25$. Seven items were eliminated with means above 6.8 on a 0 to 9 scale. Inter-item reliability coefficient alpha of the resulting 16 item measure is .93, ($n=221$). Retest reliability measured over a twelve day period is .77 ($n=36$). The low retest reliability appears to be due to higher scores on the pretest, as the overall item mean for the first testing was 5.88 and the second testing was 6.18. Test-retest reliability over 3 weeks with the current sample was .80 ($n=104$). The scale mean on the pre-test ($n=221$) was 84.26 with a standard deviation of 23.65.

Midterm Grade Evaluation. This two-item scale asks students to indicate what midterm grade they received and how they regard that grade on a continuum of success to failure (see Appendix D). Students first indicate the grade they received on a 5 point scale with A = 1 and E = 5. Walsh (1967, 1968) found that self-reported grades were fairly reliable. Students will also indicate their evaluation of their grade on a 7 point scale with 0 = "totally a failure" and 6 = "totally a success". 
Revised Causal Dimension Scale (RCDS). This 12 item attribution measure represents Russell's (1982) 9 item Causal Dimension Scale, which measures locus of causality, stability, and controllability, with the addition of 3 items measuring "globality" (see Appendix E). The measure asks participants to indicate a cause for their particular outcome, then asks for ratings of that cause on causal dimensions on nine point semantic differentials. This revised version does not prompt participants on every question with reference to the cause as does the original to make the instrument less visually confusing. The internal consistency (alpha coefficient) for the 3 original CDS scales reported by Russell (1982) (n=189) are .87, .84, and .73, respectively. However, Russell et al. (1987) (n=161) reported slightly lower values (.79, .86, and .51). Note that the controllability scale is somewhat questionable. The controllability items were revised by the investigator in this current scale so that reference to other people was eliminated from those items. For example, item 2 in the original reads "Is this cause: controllable by you or other people...". The globality items (items 10, 11, 12) were constructed by the investigator for the present study with reference to the Particular Attributions Questionnaire (PAQ) developed by Metalsky et al. (1987). The CDS was chosen over the PAQ, because the CDS has more complete psychometric data available and can be completed more quickly. The
internal consistencies of the dimensions used with this study's sample (n=109) for locus of causality, stability, controllability, globality were .67, .76, .53, .66 respectively, which are lower, except on controllability, than previously found reliability figures. Means and standard deviations of the scales were respectively, locus of causality (17.59; 5.11), stability (10.65; 5.94), controllability (17.55; 5.64), globality (16.66; 6.28).

Procedure

Participants completed the Course Requirements Self-Efficacy Scale and the College Self-Efficacy Scale during the first week of the quarter. This was done in the classroom setting which was allowed with the current screening policy.

One or two days after the students received their midterm grades, students came in for the second session of testing. Four second session options were provided so that students would be able to return for the second session. Participants completed the demographic questionnaire, then completed the Midterm Grade Evaluation, the Revised CDS, the CRES, and the CSES. Students were debriefed with a lecturette about the concepts under investigation (see Appendix F).

Final course grades were collected from the Psychology 100 office notebooks. Once the grade data was analyzed, an arbitrary number replaced the social security number, and
the original grade list was destroyed.
CHAPTER IV
RESULTS

The main focus of this study is on whether attributions, explanations for success and failure, mediate the effects of midterm grade outcome on self-efficacy expectations (i.e. perceptions of competence). It has explored the way that attributions may mediate the relationship between grade outcome and self-efficacy. More specifically, it was predicted that self-enhancing attributions correlate positively and self-depreciating attributions correlate negatively with course requirements self-efficacy and with college self-efficacy. In addition, the effects of global attributions to a specific grade on generalized academic self-efficacy were examined. Finally, the relationships between midterm and final course grades with college and course requirements self-efficacy were studied. The relative contributions of self-efficacy and attributions to predicting final grade was also explored.

Participants

Participants were 76 female and 34 male first quarter students. Their average age was 18.7 (SD=.54) with a range of 17.7 to 21.5 years. Demographic data on race are
presented in Table 1 for descriptive purposes. Race was not a variable included in the analyses.

**Hypotheses 1 & 2 : Attributions as Mediating Variables**

Hypothesis 1 predicted that the proportion of variance in course requirements self-efficacy accounted for by midterm grade outcome would be greatly reduced by the entry of attributions first into a hierarchical regression analysis (i.e., attributions will mediate the effect of outcome on self-efficacy).

The hierarchical regression provides a means to test mediator effects and the following explains the logic behind the analysis. Beta weights are standardized regression coefficients that serve as indicators of the relative importance of variables (SPSS, 1988). In the hierarchical regression, the variance in self-efficacy accounted for by the attributional dimensions is determined first and that includes any shared variance with midterm evaluation. Thus, the midterm evaluation beta weight represents the unique contribution to self-efficacy of that variable. If the beta weight of midterm evaluation entered last into the equation is significantly lower than the beta weight of midterm evaluation entered first, we could assume that the attributions were mediating the effect of outcome on self-efficacy.

A hierarchical multiple regression analysis was performed. The beta weight of midterm grade evaluation was
not significantly reduced by the entry of attributional
dimensions into the regression equation, so the hypothesis
was not supported. The Beta weight of midterm grade
evaluation before entry of attributions was .40, \( p<.001 \) and
after the entry its was .39, \( p<.001 \). In addition, when
entered together in the equation, none of the attributional
dimensions manifest a significant relationship to course
requirements self-efficacy. Thus, hypothesis 1 was not
supported by the data.

Hypothesis 2 predicted that the proportion of variance
in college self-efficacy accounted for by midterm grade
outcome would be greatly reduced by the entry of
attributions first into a hierarchical regression analysis.
That analysis was performed and the overall equation
including the attributional dimensions and midterm grade
evaluation predicted a significant amount of variance in
college self-efficacy, \( F(5,98) = 2.27, p<.05 \). Table 2 shows
the beta weights and relative significance of the
attributional dimensions and midterm grade evaluation.
The mediation hypothesis could not be tested because midterm
grade evaluation did not account for a significant amount of
variance in college self-efficacy when entered alone in the
regression. However, attributions to a more internal locus
of causality related significantly and positively to college
self-efficacy. It appears that the strong relationship
between locus of causality and college self-efficacy
accounts for the significance of the overall attribution equation. Hypothesis 2 was not supported but support was found for the relationship of one attributitional dimension with college self-efficacy.

The Correlation Between Actual Grade and Midterm Grade Evaluation

The correlation between actual midterm grade and the students' evaluation of their midterm grades was $r = .81$, $p < .001$ (see Figure 1). It is apparent from Figure 1, a plot of the correlation between midterm grade and perceptions of success, that there is more variability in self-evaluation as students receive higher grades. Two students who received A's (scores 45 and above) did not indicate their grade as a success. Six students, 20.6% of those receiving B's, did not indicate their grade as a success. Forty-one students, 93.1% of those receiving C's, did not indicate their grade as a success, with 63.6% indicating that it was a partial or total failure. Thus, students receiving average scores are evaluating themselves more negatively than they would if there was a perfect correlation between grade and self-evaluation.

Hypotheses 3 & 4: Effects of Midterm Grade Evaluation on Post-test Course and College Self-Efficacy

Hypothesis 3 predicted that a higher degree of perceived midterm success would correlate positively with an increase in course requirements self-efficacy.
A regression analysis was performed with the difference between pre and post tests as the dependent variable and midterm grade evaluation as the predictor. Table 3 summarizes the means and standard deviations for the pre and post tests and the difference score between them as well as provides t-test results. The effect of midterm grade evaluation on a change in course self-efficacy was significant, \( F(1,100) = 24.40, \ p < .001 \). Perceiving one's midterm as successful corresponded with a significant increase in course self-efficacy while a perception of failure corresponded with a nonsignificant decrease in course self-efficacy as tested with paired t-tests. An independent t-test was performed to ensure that the success and failure groups were equal on the pre-test and no significant difference in means was found, \( t(89) = -.32, \ p < .75 \). Hypothesis 3 was supported.

Hypothesis 4 predicted that a higher degree of perceived midterm success correlates positively with an increase college self-efficacy. Table 4 summarizes the means and standard deviations of pre and post tests and the difference score between them as well as t-test results. The effect of midterm grade evaluation on college self-efficacy was significant, \( F(1,100) = 3.79, \ p < .05 \), therefore, hypothesis 4 was supported. Similar to the results with course self-efficacy, success resulted in a significant increase in college self-efficacy, while failure
resulted in a nonsignificant decrease tested with paired t-tests. An independent t-test was performed to ensure that the success and failure groups were equal on the pre-test and no significant difference in means was found, $t(90) = - .53$, $p < .59$.

The Effects of Outcome on Attributions

A MANOVA was performed to examine the effects of performance outcome on attributions, although no hypotheses were indicated, so that full information on the relationships between outcome, attributions, and self-efficacy is available. Perceived success had significant between-subjects and within-subjects effects on attributions, and no interaction effect was found [$F(1, 89) = 56.89$, $p < .001$; Wilk's Lambda $(1, 3) = p < .001$ respectively]. It was expected that outcome would affect attributions, therefore a between subjects-effect was expected. The within-subjects effects suggests that participants varied in their responses to the attributional dimensions, which is consistent with data reviewed later. Table 5 summarizes the correlations among attributional dimensions. Table 6 summarizes the means and standard deviations for the attributional dimensions for each outcome group and the total group.
Hypotheses 5 & 6: Attribution by Outcome Effects on Course Self-Efficacy

Hypothesis 5 predicted that internal, stable, controllable, and global attributions for those indicating a successful midterm grade would relate positively to course requirements self-efficacy. Hypothesis 6 predicted that external, unstable, controllable, and specific attributions for those indicating a failing midterm grade relate positively to course requirement self-efficacy.

The participant pool was divided into success and failure groups for the multiple regression with their scores on the midterm grade evaluation scale in which they defined their perceived degree of success. Those scoring 0 to 2 on the scale were assigned to the failure group (n=50) and those scoring 4 to 6 assigned to the success group (n=42). Eighteen participants scored a 3 on the midterm grade evaluation scale which meant they defined their grade as neither a success nor a failure and were left out of the analyses done by outcome group. The mean score was a 3.01.

Simultaneous multiple regressions were performed by outcome group with attributional dimensions as the predictors and post-test course self-efficacy as the dependent variable.

For the success group, the overall regression equation did not account for a significant amount of variance in course self-efficacy, thus hypothesis 5 was not supported.
However, more stable attributions for the success were positively related to course self-efficacy, Beta = .41, t(41) = 2.57, p<.05. Table 7 summarizes the beta weights and predictive significance of the attributional dimensions for the success group.

For the failure group, the overall regression equation was also not significant, so hypothesis 6 was not supported. However, more global attributions for the failure corresponded with lower course self-efficacy, Beta = -.32, t(49) = -2.23, p<.05. Table 8 summarizes the beta weights and predictive significance of the attributional dimensions for the failure group. The significant dimensional findings are consistent with the theoretical predictions about the direction attributions would influence self-efficacy. However, Hypotheses 5 and 6 for course self-efficacy were not supported for all attributional dimensions.

Hypotheses 7, 8, 9 & 10: Attribution by Outcome Effects on College Self-Efficacy

Hypothesis 7 predicted that internal, stable, controllable, and global attributions for those indicating a successful midterm grade would relate positively to college self-efficacy. Hypothesis 8 predicted that external, unstable, controllable, and specific attributions for those indicating a failing midterm grade would relate positively to college self-efficacy. In addition, hypothesis 9 and 10 focused on the greater power of the globality dimension to
mediate the relationship between a specific outcome and the more general college self-efficacy.

Hierarchical multiple regressions were performed by outcome group with attributional dimensions as the predictors and post-test college self-efficacy as the dependent variable. Globality was entered first in the equation. Table 9 summarizes the beta weights for the hierarchical regression. For the success group, the equation including all attributional dimensions was significant, $F(4,36) = 2.61, p<.02$, thus Hypothesis 7 was supported. Hypothesis 9 was also supported, as more global attributions for success related positively to college self-efficacy, $F(1,39) = 5.49, p<.05$ in a single regression equation. However, globality did not contribute significantly to the prediction of self-efficacy when it was included in the multiple regression. The latter finding may be due to the high intercorrelations between attributions and it is possible that the globality dimension accounts for the significance of the overall equation.

For the failure group, the overall regression equation did not account for a significant amount of variance in college self-efficacy. However, more internal attributions for the failure related positively to college self-efficacy, $\beta = .30, t(49) = 2.1, p<.05$. Table 10 summarizes the beta weights for this hierarchical regression. These data are counter to prediction in Hypothesis 8. In addition,
globality attributions did not account for a significant amount of variance, even when entered alone into the regression equation, thus Hypothesis 10 was not supported.

**Hypothesis 11: The Effects of Globality Attributions on the Correlation Between Course and College Self-Efficacy**

Regression analyses of the correlation between course and college self-efficacy were performed based on high and low groups on the globality dimension. The range of globality scores was 3 to 27. The group was divided at 16, with 16 and below representing 50.9% of the sample. Counter to prediction, the correlation between course and college self-efficacy was higher for the group with lower globality attributions ($r = .59$) than the higher group ($r = .42$). Both correlations are significant at the .005 level. A Fisher's Z-transformation of $r$ revealed that the difference between the two correlations was not significant, $Z (102) = 1.15, p < .13$. Hypothesis 11 was not supported.

**Hypotheses 12 & 13: The Relationship Between Course and College Self-Efficacy With Final Course Grade**

The relationships between self-efficacies and final course grade were tested with zero order correlations. The final grade mean was a 6.28 ($SD = 2.83$), a little above a B minus, on a scale of 0 = F and 10 = A. Final grade was positively related to post-test course self-efficacy, supporting Hypothesis 12, $r(110) = .50, p < .001$, and to post-test college self-efficacy supporting Hypothesis 13, $r(105)$
= .31, p<.001. Pre-test course and college self-efficacy did not relate significantly to final course grade.

The correlation between midterm grade and final grade was \( r(117) = .82, p<.001 \), which is not too surprising given that midterm grade contributes directly to the computations of final grade.

The Relative Contributions of Self-Efficacy and Attributions in Predicting Final Course Grade.

No hypotheses were written to predict the relative contributions of self-efficacy and attributions to predict final grade, but in the literature review, an argument is put forth that the data supporting a direct relationship between attribution and grades is not supported theoretically, while a relationship between self-efficacy and grades is theoretically supported. Thus, two hierarchical regressions, with course and college self-efficacy, were performed to examine self-efficacy and attributions as predictors for final grade. Self-efficacy was entered first in the equation to see if self-efficacy mediated the effects of attributions on final grade, consistent with the proposed sequential path of outcome, attributions, self-efficacy, persistence or concentration, leading to grade.

Table 11 summarizes the beta weights and their significances for the hierarchical regression with course requirements self-efficacy. The total equation was
significant, \( R^2 = .39, F(5, 101) = 13.22, \ p<.001 \). Self-efficacy accounted for a significant amount of variance in final grade; however, the controllability dimension also accounted for a significant amount of unique variance. Therefore, course requirements self-efficacy is not mediating the effects of attributions on final grade. Self-efficacy and attributions are both independent and valid predictors of final grade.

Table 12 summarizes the beta weights and their significances for the hierarchical regression with college self-efficacy and attributions as predictors of final course grade. The total equation was significant, \( R^2 = .33, F(5, 96) = 9.60, \ p<.001 \). College self-efficacy accounted for a significant amount of variance in final grade; however, controllability attributions accounted for more variance and stability attributions also contribute significantly to the prediction of final grade. Therefore, college self-efficacy is not mediating between attributions and final grade. College self-efficacy and attributions are both independent and valid predictors of final grade.
CHAPTER V

DISCUSSION

This chapter relates the results to the hypotheses, the findings in the literature, and to attribution and self-efficacy theories. Limitations of the study and suggestions for future research are also reviewed.

The main hypotheses that attributions would mediate the effects of performance outcome on self-efficacy were not supported in this study. However, specific attributional dimensions relative to specific outcomes did influence self-efficacy. A relationship between self-efficacy and grades was supported, as well as a relationship between attributions and grades.

Overall, the study provides support for the hypothesized influence of success experiences on increasing self-efficacy expectations, no support for the effect of failure to decrease self-efficacy, and moderate support for the influence of attributions in developing self-efficacy expectations and the importance of academic self-efficacy in predicting academic success.
Hypotheses

Attributions as Mediating Variables

The results did not support the hypotheses that attributions would mediate the effect of midterm performance on course requirements self-efficacies. This result differs from the support found in Zilber (1988). This study was performed to lend external validity to the findings from Zilber (1988); however, there were a number of threats to internal validity in this study. Methodological differences between the two studies might explain the inconsistency of the results between the two studies. In Zilber (1988), a highly controlled analogue design was used, the performance area was one in which students would have little or unclear self evaluation information, and attributions were measured directly after performance feedback. This is in contrast with the real life grade feedback experience in this study and that the attribution measures were not administered until a day or two, and in the case of some, a week after receiving the midterm grade. In addition, different attribution measures were used in the two studies.

However, in another analogue study, Hackett, Betz, O'Halloran, and Romac (1990) also found that attributions did not greatly reduce the effect of outcome on self-efficacy but that attributions did relate to self-efficacy.

The mediation hypothesis with college self-efficacy could not be tested because midterm grade evaluation did not
predict self-efficacy when entered alone in a regression. It is noteworthy that despite the absence of an outcome effect on self-efficacy, attributions to more internal causes did predict college self-efficacy, so perhaps attributions can effect self-efficacy independent of particular outcomes. That finding lends support to the theory suggesting that people have general attributional styles (Burns & Seligman, 1989; Metalsky et al., 1987).

Theoretically, attributions may not play as powerful a role in the development of self-efficacy expectations as initially predicted by the integration of the reformulated learned helplessness and self-efficacy theories.

The Effects of Performance Outcome on Course and College Self-Efficacy

Perceptions of success on the midterm were used in the analyses of the effects of outcome on self-efficacy. It is important to note for future research that actual midterm grades correlated highly with the perceptions, with students manifesting a slight tendency to feel less satisfied with themselves than indicated statistically by their position within the total group, (i.e., a C grade was not considered neutral or average, but as a failure).

Midterm performance did affect both course and college self-efficacies, lending support to two hypotheses. Success significantly increased self-efficacy while failure did not significantly lower self-efficacy, which is the reverse of
findings in Zilber (1988). This finding is also counter to the depression/attribute literature which suggests greater change after failure events (Schoeneman et al., 1986). In addition, Campbell and Hackett (1986) and Hackett and Campbell (1987) found that failure as well as success influenced self-efficacy. It is possible that students employed self-enhancing attributions that buffered them against lowering their self-efficacy while bolstering their self-efficacy in the case of success. For the failure group, attributions to more specific causes were related to higher self-efficacy.

Despite the lack of significant findings for the effects of failure, these findings lend support to self-efficacy theory and the importance of performance outcomes as information contributing to the development of self-efficacy expectations.

Attributional Dimensions' Effect on Self-Efficacy

Some specific attributions had specific effects on self-efficacy by outcome groups. Lack of support for the influence of all attributional dimensions was not consistent with the meta-analysis results (Sweeney et al., 1986) which suggest that all attributional dimensions contribute to the prediction of depression. Nonetheless, the results of the present study are consistent with the results of individual studies, which generally find differential predictive power.
for different attributions depending on the achievement context.

In the present study, attributions to a more stable cause of outcome in the success condition related positively to course self-efficacy. In the case of failure, attributions to a more global cause related negatively to course self-efficacy. The directions of both of these findings are consistent with the hypotheses and attribution theory. However, given that not all of the dimensions predicted self-efficacy, the overall hypotheses were not supported. In addition, finding that separate attributional dimensions have different predictive power fits in with finding a significant within subjects effect of outcome on attributions.

Different results were found for the relationship between attributional dimensions and college self-efficacy. More global attributions for success related positively to college self-efficacy. This finding supported the prediction that global attributions to a specific feedback event would generalize the outcome effect to more general self-efficacy expectations. This finding is consistent with the findings of Metalsky et al., (1987) and Mikulincer (1986). However, Mukulincer (1986) and Metalsky et al. (1987) found that a combination of global and stable attributions was necessary for generalization effects from specific outcomes to general mood and depression. Hackett
et al (1990) found that task performance effects generalized to self-efficacy and interest rating of an irrelevant task and to global ratings of math and verbal ability. Unfortunately, they did not include a globality dimension in their analyses, so it is difficult to determine the mechanism through which students are generalizing their self-efficacy.

Global attributions did not significantly contribute to the prediction of self-efficacy in the case of failure. This was counter to prediction, as it was expected that less global attributions would relate positively to self-efficacy in the case of failure. Again, given that not all the attributional dimensions were significant predictors, the overall hypotheses were not fully supported, but individual dimensional findings are worth consideration.

The Effects of Globality Attributions on the Correlations between Course and College Self-Efficacy

To test the importance of the globality dimension for generalization effects a different way, correlations between course and college self-efficacy were compared for high and low globality attribution groups. There was no significant difference in correlations by globality group. However, support for the importance of globality attributions was found in the regression analyses previously mentioned when outcome group was considered into the analysis.
Midterm and Final Grade Relationships to Self-Efficacy

Final grade related positively to both post-test course and college self-efficacies, while having no relationship to pre-test self-efficacies. Thus, the hypotheses were supported and the findings were consistent with previous findings (Lent et al., 1984, 1986, 1987; Sherer et al., 1987; Wood & Locke, 1987). Theoretically, higher self-efficacy would result in less anxiety and therefore less avoidance of studying and less interference with concentration which could lead to higher final grades.

The Relative Contributions of Self-Efficacy and Attributions in Predicting Final Course Grade

Post hoc analyses on the prediction of final grade revealed that self-efficacy and attributions are independent and valid predictors of final course grade. This finding suggests that there may be an independent path between attributions and grade as well as an indirect path to grade via self-efficacy, as found in Relich et al. (1986). One possible explanation for a direct and indirect path from attributions to grades is that if a person makes a stable attribution, it would more likely affect self-efficacy which might affect future performance. If a person makes an unstable attribution, for example, to effort, she or he may simply change studying behaviors without changing self-efficacy expectations. Lending support for that explanation, ratings on controllability for course self-
efficacy, and stability and controllability for college self-efficacy, accounted for the most variance in final grade. Thus, the effect of internal (controllability can be interpreted as an internal attribution) and stable attributions on final grade was mediated by self-efficacy.

Limitations

Threats to internal validity in this study include the lack of validity data on the self-efficacy measures, that the college self-efficacy measure includes some items that could be considered outcome expectancies, and late timing in administering the attributional measure after grade feedback. These limitations may have decreased the power of the study to detect a significant attribution mediator effect of outcome.

Although sex differences were not hypothesized in this study, it would have been advantageous to have equal numbers of males and females, while there are over twice as many women in this sample than men. There may have been unequal numbers of men and women if there was a study that asked specifically for men the same time my study was running or if there are simply less men taking introductory psychology their first quarter of college. If sex differences do exist, the sample population may not be representative. In fact, a test of the main mediation hypothesis performed by sex revealed a significant mediator effect with attributions for men, but not for women.
Further analyses for a different paper would need to performed to examine the nature of those sex differences.

Due to university policies, aptitude test scores and course grades in other courses were not available, and they could have provided valuable information about interactions with ability and performance in other courses.

**Implications for Counseling and Teaching**

Although the mediator hypothesis was not supported, both attributions and self-efficacy expectations were significantly related to final course grade. Students can be encouraged by instructors and counselors to consider internal, stable, global, and high control attributions for their successes, and external, unstable (i.e., to effort), specific and high control attributions for failures. Students who are unhappy with their performance can be encouraged to persist and not assume they have no control over future performance. Such students may be helped by learning study skills, cognitive restructuring (such as countering negative thoughts), and relaxation techniques to actually increase skill and decrease anxiety. Students may feel more control over future outcomes if they believe they are doing something differently or have new skills that they did not have for their last test.

Counselors may explore client's histories of achievement and how they may have developed a particular attributional style. Counselors and teachers may encourage
students to pursue new skill areas, particularly ones previously ignored due to sex role or socio-economic limitations, and create mastery experiences of graduated difficulty so that self-efficacy expectations can develop. Ultimately, the goal in counseling is to help the client gain a sense of greater power in the world. According to current research findings, this translates to real power in the world, since the student with a greater sense of power is more likely to persist and have better concentration. One example of an attributional intervention was done by Sprinthall and Scott (1989). The authors trained 11th grade girls how to use positive reinforcement and reduce math self-efficacy for tutoring 4th and 5th grade girls. The girls who received tutoring increased their tendency to attribute math success to themselves and attribute failure more to task difficulty, while the control group remained the same except they increased their tendency to blame themselves for failure. The tutored girls also showed a significant increase in their California Achievement Test scores over the control group.

Future Research

Theory testing in academic self-efficacy would be stronger if a measure could be developed and re-used to establish validity data. Researchers are creating new measures for each study and it is difficult to compare findings. In addition, although attribution researchers are
more consistent in their use of attribution measures, no one measure has included all four attributional dimensions as does the one in this study and validity data on this new measure would be useful for use in future studies. Research on self-efficacy which includes measurement of attributions should include analyses directly examining their relationship such as performed in this study.

It would be a logical next step to perform this study to examine sex differences in attributions by choosing sex-typed courses such as math or science. Another area for exploration is the stability and consistency of attributional styles over the course of 4 years of college. One such study could obtain attributions for each final course grade and compare results with regards to sex typing of course, year in school, previous performance, and initial aptitude testing. Such a study may allow researchers to tease out the directionality of relationships between performance, efficacy, and attributions. Use of path analyses procedures such as LISREL might also help establish these relationships more clearly.

More studies on when, how, and why an outcome on a specific task would result in a change in generalized self-efficacy are also necessary so that interventions to promote greater academic confidence can be designed.
CHAPTER VI
SUMMARY

Research is beginning to establish a relationship between attributions and self-efficacy expectations for academic and career behaviors. Causal attributions are cognitive explanations for positive and negative outcomes. A number of studies have already provided support for a relationship between certain types of attributions and depression (Sweeney, Bailey, & Anderson, 1986), confirming that attributions may be powerful determinants of affect, cognition, and behavior.

Attributions may therefore be expected to influence one type of cognition: self-efficacy expectations (Bandura, 1977). A self-efficacy expectation is a belief concerning whether one can successfully perform a given behavior. Bandura's (1977) theory predicts that self-efficacy levels determine whether behaviors are attempted or avoided, while self-efficacy strengths determine persistence and success in the face of barriers to achievement. Bandura (1977) noted that performance accomplishments are the most powerful source of information contributing to the development of self-efficacy expectations. He added, however, that the
influence successes or failures have on efficacy depends on how they are perceived.

Schunk (1981, 1984) has directly investigated and provided support for the relationship between attributions and academic self-efficacy with elementary school children. Academic self-efficacy is important for college students as Lent, Brown, and Larkin (1984, 1986, 1987) found repeatedly that higher academic self-efficacy was related to greater persistence and higher academic achievement in college students. Research on college students has established a relationship between attributions and self-efficacy expectations, but do not address the question of directionality. Peterson and Barrett (1987) found that attributions have an influence on college level academic achievement; however, they do not provide a theoretical explanation for how attributions would have such an effect. Self-efficacy theory may provide an explanation for that finding if it can be assumed that attributions contribute to the development of self-efficacy expectations which then influence academic behaviors which in turn influence academic outcomes. Zilber's (1988) analog study suggested that attributions contributed to the prediction of self-efficacy expectations beyond the effect of performance outcomes alone.

The present study tested the attribution/self-efficacy relationship with real performance outcomes as well as in
the context of college achievement. Metalsky, Halberstadt, and Abramson (1987) investigated whether task-specific attributions would have a generalized effect on general mood. They found that midterm outcome predicted immediate affective response, but that at later times, depressive mood reactions were predicted solely by the attribution by outcome interaction. The present study, was a variation of the Metalsky et al. (1987) investigation, replacing the dependent variable, depressive mood, with academic self-efficacy. It was similarly designed to test whether attributions for a specific test outcome would influence specific self-efficacy as well as generalize to global academic self-efficacy. Of primary interest is whether attributions mediated the effect of outcome (midterm success or failure) on coursework and general academic self-efficacy.

Participants

Participants were 76 female and 34 male first year students taking an introductory psychology class in their first quarter of enrollment at a large midwestern university.

Brief Summary of Procedure

Participants were informed that their participation in the pre-screening is voluntary and that participation in the second part required release of their final course grade. They then indicated their social security number and
completed course and college self-efficacy measures. One or two days after the first midterm, students reported their midterm grade, their personal evaluation and attributions for that grade, and completed course and college self-efficacy measures. Final and first midterm course grades were obtained from the introductory psychology office records with signed permission from the students.

**Instruments**

Course requirements self-efficacy was measured with a 6 item Likert-type scale assessing self-efficacy strength for tasks required by the introductory psychology course. College self-efficacy was measured with a 16 item scale assessing general academic self-efficacy strength for college work. Students indicating their evaluation of their midterm grade on a 7 point scale with 0 = "totally a failure" and 6 = "totally a success". Attributions were measured with a 12 item revised version of Russell's (1982) Causal Dimension scale. The new scale measured locus of causality, stability, and controllability, with the addition of 3 items measuring "globality". The measure asked participants to indicate a cause for their particular outcome, then asked for ratings of that cause on causal dimensions on nine point semantic differentials.

**Results and Discussion**

The two primary hypotheses predicted that attributions would mediate the effects of outcome on course requirements
and general academic self-efficacy and they were not supported by the data, contradicting the findings in Zilber (1988). Self-evaluation of success on the midterm was positively related to an increase in course and college self-efficacy, while those experiencing failure did not show a significant decrease in self-efficacies. This finding, therefore, lends partial support to the hypothesized effect of outcome on self-efficacy.

The effects of specific attributions on course requirements and college self-efficacy were examined. Attributions to a more stable cause of outcome in the success condition related positively to course self-efficacy. In the case of failure, attributions to a more global cause related negatively to course self-efficacy. The directions of both of these findings are consistent with the hypotheses and attribution theory. However, given that not all of the dimensions predicted self-efficacy, the overall hypothesis was not supported.

Different results were found for the relationship between attributional dimensions and college self-efficacy. More global attributions for success related positively to college self-efficacy. This finding supported the prediction that global attributions to a specific feedback event would generalize the outcome effect to more general self-efficacy expectations. However, global attributions did not significantly contribute to the prediction of self-
efficacy in the case of failure and they did not affect correlations between course and college self-efficacy. The role of globality attributions in creating generalization of self-efficacy remains in question.

As predicted, final grade related positively to both post-test course and college self-efficacies, while having no relationship to pre-test self-efficacies. Post hoc analyses on the prediction of final grade revealed that self-efficacy and attributions are independent and valid predictors of final course grade. This finding suggests that there may be an independent path between attributions and grade as well as an indirect path to grade via self-efficacy. The independent path between attributions and grades may be created by students making attributions to unstable causes, because self-efficacy mediated the effects of attributions to greater controllability and to more stable causes on grades.

Limitations of the present study include a time delay between grade feedback and completion of the attribution measure, lack of validity data on the self-efficacy measures, lack of data on aptitude or other course grades, and an unbalanced sample by sex.

Given that both attributions and self-efficacy were significant predictors of final grade, instructors and counselors should facilitate self-enhancing attributions for successes and failures. Counselors may also teach study
skills and relaxation techniques to reduce anxiety and increase self-efficacy.

Future research should use a standardized, validated academic self-efficacy measure and similar studies should be performed in varied learning contexts. Sex differences might be examined in relation to sex-typed learning contexts. Information about how and when self-efficacy for a task generalizes would aid design of interventions to enhance general efficacy. Investigations must now focus on the directions of relationships between performance, self-efficacy, and attributions.
LIST OF REFERENCES


Table 1

Frequencies and Percentages of Race of Sample

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<th>Race</th>
<th>n</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>95</td>
<td>87.2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5</td>
<td>4.6</td>
</tr>
<tr>
<td>Black</td>
<td>4</td>
<td>3.7</td>
</tr>
<tr>
<td>Asian-American</td>
<td>3</td>
<td>2.8</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>1.8</td>
</tr>
<tr>
<td>Missing Data</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>110</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 2

Hierarchical Multiple Regression for Post-test College Self-Efficacy Predicted by Attributional Dimensions and Midterm Grade Evaluation

<table>
<thead>
<tr>
<th>Dependent Variable, Predictor</th>
<th>Beta Weight</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-test College Self-Efficacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controllability</td>
<td>-.18</td>
<td>-1.44</td>
<td>.15</td>
</tr>
<tr>
<td>Stability</td>
<td>.02</td>
<td>.17</td>
<td>.86</td>
</tr>
<tr>
<td>Locus of Causality</td>
<td>.33</td>
<td>2.81</td>
<td>.006</td>
</tr>
<tr>
<td>Globality</td>
<td>-.11</td>
<td>-1.05</td>
<td>.30</td>
</tr>
<tr>
<td>Midterm Grade Evaluation</td>
<td>.11</td>
<td>.87</td>
<td>.38</td>
</tr>
</tbody>
</table>

Note. $R^2 = .10$, $F(5, 98) = 2.27$, $p < .05$.
For the regression performed only with midterm grade evaluation, $R^2 = .02$, $F(1, 102) = 2.30$, $p < .13$, Beta = .14.
Table 3
Means and Standard Deviations for Pre and Post Course Requirements Self-Efficacy by Perceived Success and Failure Groups

<table>
<thead>
<tr>
<th></th>
<th>Success n=42</th>
<th>Failure n=50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Difference between pre and post-tests$^a$</td>
<td>4.85</td>
<td>6.9</td>
</tr>
<tr>
<td>Pre-test</td>
<td>38.29</td>
<td>7.6</td>
</tr>
<tr>
<td>Post-test</td>
<td>43.44</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Note. a) $F(1,100) = 24.40$, $p<.001$: Regression analysis of pre and post difference with midterm evaluation.

b) $t(89) = - .32$, $p<.75$: Independent t-test between pretest means.

c) $t(40) = -4.50$, $p<.001$: Paired t-test between pre and post for the success group.

d) $t(49) = 1.72$, $p<.09$: Paired t-test between pre and post for the failure group.
### Table 4

Means and Standard Deviations for Pre and Post College Self-Efficacy by Perceived Success and Failure Groups

<table>
<thead>
<tr>
<th></th>
<th>Success n=41</th>
<th>Failure n=47</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Difference between pre and post-tests</td>
<td>6.07</td>
<td>17.5</td>
</tr>
<tr>
<td>Pre-test</td>
<td>81.98</td>
<td>21.4</td>
</tr>
<tr>
<td>Post-test</td>
<td>88.59</td>
<td>21.3</td>
</tr>
</tbody>
</table>

**Note.**

a) \( F (1,100) = 3.79, p < .05. \) Regression analysis of pre and post difference with midterm evaluation.

b) \( t(90) = -.53, p < .59 \) : Independent t-test between pretest means.

c) \( t(40) = -2.22, p < .032 \) : Paired t-test between pre and post for the success group.

d) \( t(46) = .82, p < .41 \) : Paired t-test between pre and post for the failure group.
Table 5
Correlations Among Attributional Dimensions

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Locus of Causality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Stability</td>
<td>.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Controllability</td>
<td>.55</td>
<td>.47</td>
<td></td>
</tr>
<tr>
<td>(4) Globality</td>
<td>.62</td>
<td>.38</td>
<td>.34</td>
</tr>
</tbody>
</table>

*Note.* All correlations are significant at p<.001.
Table 6
Means and Standard Deviations for Attributional Dimensions by Total, Perceived Success, and Failure Groups

<table>
<thead>
<tr>
<th>Attributional Dimensions</th>
<th>Total* n=110</th>
<th>Success n=42</th>
<th>Failure n=50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Controllability</td>
<td>17.56</td>
<td>5.6</td>
<td>21.40</td>
</tr>
<tr>
<td>Stability</td>
<td>10.65</td>
<td>5.9</td>
<td>14.29</td>
</tr>
<tr>
<td>Locus of Causality</td>
<td>17.60</td>
<td>5.1</td>
<td>20.43</td>
</tr>
<tr>
<td>Globality</td>
<td>16.56</td>
<td>6.3</td>
<td>19.38</td>
</tr>
</tbody>
</table>

Note: * The total number includes the 18 participants who indicated a neutral score on the midterm evaluation scale.
Table 7

Simultaneous Multiple Regression for Post-test Course Requirements Self-Efficacy Predicted by Attributional Dimensions for the Perceived Success Group

<table>
<thead>
<tr>
<th>Dependent Variable, Predictor</th>
<th>Beta Weight</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-test Course Self-Efficacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controllability</td>
<td>-.04</td>
<td>-.19</td>
<td>.850</td>
</tr>
<tr>
<td>Stability</td>
<td>.41</td>
<td>2.57</td>
<td>.014</td>
</tr>
<tr>
<td>Locus of Causality</td>
<td>.06</td>
<td>.32</td>
<td>.752</td>
</tr>
<tr>
<td>Globality</td>
<td>.04</td>
<td>.24</td>
<td>.810</td>
</tr>
</tbody>
</table>

Note. Total equation $R^2 = .19$, $F(4, 37) = 2.20$, $p<.087$. 
Table 8

Simultaneous Multiple Regression for Post-test Course Requirements Self-Efficacy Predicted by Attributional Dimensions for the Perceived Failure Group

<table>
<thead>
<tr>
<th>Dependent Variable, Predictor</th>
<th>Beta Weight</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-test Course Self-Efficacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controllability</td>
<td>-.05</td>
<td>-.37</td>
<td>.712</td>
</tr>
<tr>
<td>Stability</td>
<td>.01</td>
<td>.10</td>
<td>.917</td>
</tr>
<tr>
<td>Locus of Causality</td>
<td>.05</td>
<td>.35</td>
<td>.722</td>
</tr>
<tr>
<td>Globality</td>
<td>-.32</td>
<td>-2.23</td>
<td>.030</td>
</tr>
</tbody>
</table>

Note. Total equation $R^2 = .10$, $F(4, 44) = 1.26$, $p<.297$. 
Table 9
Hierarchical Multiple Regression for Post-test College Self-Efficacy Predicted by Attributional Dimensions for the Perceived Success Group

<table>
<thead>
<tr>
<th>Dependent Variable, Predictor</th>
<th>Beta Weight</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-test College Self-Efficacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Globality</td>
<td>.23</td>
<td>1.42</td>
<td>.162</td>
</tr>
<tr>
<td>Controllability</td>
<td>-.20</td>
<td>-1.01</td>
<td>.315</td>
</tr>
<tr>
<td>Stability</td>
<td>.23</td>
<td>1.40</td>
<td>.169</td>
</tr>
<tr>
<td>Locus of Causality</td>
<td>.31</td>
<td>1.55</td>
<td>.127</td>
</tr>
</tbody>
</table>

Note. Total equation $R^2 = .22$, $F(4, 36) = 2.61$, $p<.05$. 
Table 10
Hierarchical Multiple Regression for Post-test College Self-Efficacy Predicted by Attributional Dimensions for the Perceived Failure Group

<table>
<thead>
<tr>
<th>Dependent Variable, Predictor</th>
<th>Beta Weight</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-test College Self-Efficacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Globality</td>
<td>-.25</td>
<td>-1.78</td>
<td>.081</td>
</tr>
<tr>
<td>Controllability</td>
<td>-.11</td>
<td>-.77</td>
<td>.444</td>
</tr>
<tr>
<td>Stability</td>
<td>-.15</td>
<td>-1.06</td>
<td>.292</td>
</tr>
<tr>
<td>Locus of Causality</td>
<td>.37</td>
<td>2.43</td>
<td>.722</td>
</tr>
</tbody>
</table>

Note. Total equation $R^2 = .17$, $F(4, 41) = 2.10$, $p < .097$. 
Table 11
Hierarchical Multiple Regression for Final Course Grade Predicted by Attributional Dimensions and Post-test Course Requirements Self-Efficacy

<table>
<thead>
<tr>
<th>Dependent Variable, Predictor</th>
<th>Beta Weight</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total equation $R^2 = .39$, $F(5, 101) = 13.22$, $p&lt;.001$.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Course Grade</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course Self-Efficacy</td>
<td>.40</td>
<td>4.92</td>
<td>.000</td>
</tr>
<tr>
<td>Controllability</td>
<td>.32</td>
<td>3.21</td>
<td>.001</td>
</tr>
<tr>
<td>Globality</td>
<td>-.06</td>
<td>-.69</td>
<td>.491</td>
</tr>
<tr>
<td>Stability</td>
<td>.12</td>
<td>1.29</td>
<td>.198</td>
</tr>
<tr>
<td>Locus of Causality</td>
<td>.03</td>
<td>.33</td>
<td>.738</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dependent Variable, Predictor</th>
<th>Beta Weight</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Course Grade</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College Self-Efficacy</td>
<td>.30</td>
<td>3.52</td>
<td>.000</td>
</tr>
<tr>
<td>Controllability</td>
<td>.39</td>
<td>3.71</td>
<td>.000</td>
</tr>
<tr>
<td>Globality</td>
<td>-.11</td>
<td>-1.19</td>
<td>.236</td>
</tr>
<tr>
<td>Stability</td>
<td>.21</td>
<td>2.07</td>
<td>.040</td>
</tr>
<tr>
<td>Locus of Causality</td>
<td>-.05</td>
<td>-.43</td>
<td>.662</td>
</tr>
</tbody>
</table>

**Note.** Total equation $R^2 = .33$, $F(5, 96) = 9.60$, $p < .001$. 
Figure 1

The Correlation Between Midterm Grade Evaluation and Actual Midterm Grade

Note.
For self-evaluation, 0 = total failure
3 = neither a success or failure
6 = total success

For midterm grade, 45 - 50 = A
40 - 44 = B
31 - 39 = C
25 - 30 = D
24 - 0 = F

The vertical lines represent the grade point cut-offs.
APPENDIX A

DEMOGRAPHIC QUESTIONNAIRE AND GRADE RELEASE CONSENT FORM

General Information Survey and Grade Release Consent Form

Please supply the following information by filling in the appropriate circles on the answer sheet.

1. Do NOT fill in your name.

2. Fill in M or F for SEX

3. Use the "grade or educ" box to indicate RACE
   
   0 = Caucasian
   1 = Black
   2 = Hispanic
   3 = Asian American
   4 = Other

4. Fill in your BIRTH DATE

5. Fill in your SOCIAL SECURITY NUMBER in the "identification number" box.

We need access to your final grade in this course, and this course only, and would like your permission to obtain that grade from the Psychology 100 office. After recording the grades, your social security number will be replaced in our records with an arbitrary experimental number, so that your information cannot be traced back to you.

I ____________________________, give my the Psychology 100 office permission to release my final course grade to Suzanne Zilber for research purposes.

______________________________
(signature and date)

Social security # ______________________
APPENDIX B

COURSE SELF-EFFICACY SCALE

Psychology Course Skills Survey

Please indicate your confidence in your ability for performing the following tasks related only to your introductory psychology class. Indicate on the computer scoring sheet your answer for each item on the following scale:

No confidence 0 1 2 3 4 5 6 7 8 9 Complete Confidence

1. Comprehend the readings fully
2. Take good notes from the readings
3. Comprehend lecture material fully
4. Take good notes from the lectures
5. Complete exams within the time limit allowed
6. How confident are you in your skills and abilities to get an A in the class?
APPENDIX C

COLLEGE SELF-EFFICACY SCALE

Academic Skills Survey

Please indicate your confidence in your ability to successfully perform the following academic tasks. Focus on whether you believe you have the skills to achieve the outcomes or perform the behaviors described. Fill in the circle on the computer scoring sheet that best represents your level of confidence on the following scale:

No confidence 0 1 2 3 4 5 6 7 8 9 Complete Confidence

1. Receive all A's one quarter
2. Make Dean's list for 3 consecutive quarters
3. Graduate with a 3.3 or above Grade Point Average
4. Achieve a B or higher in graduate level coursework
5. Hold a part-time job and get 3.0 or above overall GPA
6. Give a good speech in class
7. Achieve a good grade in a class that is boring to me
8. Ask questions in class when I need clarification
9. Lead a class discussion
10. Pass a test without having studied for it
11. Achieve an A on a cumulative final
12. Achieve A's on two final exams in one day
13. Research and write a senior's honors thesis
14. Receive an A- or A on a paper written over 2 days
15. Complete two 10 page papers due in the same week
16. Score in the upper 25% on graduate admissions exams such as GRE, LSAT, MCAT, GMAT
APPENDIX D
MIDTERM GRADE EVALUATION

1. Please indicate the grade you received on the midterm
   1 = A
   2 = B
   3 = C
   4 = D
   5 = E

2. Please indicate how you perceive and feel about your grade in terms of success and failure.

For me this grade is:

0 1 2 3 4 5 6
Totally a Neutral Totally a Success Failure
APPENDIX E

REVISED CAUSAL DIMENSION SCALE

A. Do you think your score or grade is high or low? _____.

B. Please describe the cause(s) for your high or low score

C. Think about the reason(s) you have written above. The
items below concern your impressions or opinions of the cause
or causes of your outcome. Indicate you answer on the
computer scoring answer sheet provided and do not mark on this
page. Please note that the numbers change direction on a few
items.

Is the cause something that:

(1)
Reflects an aspect 9 8 7 6 5 4 3 2 1 Reflects an
of yourself aspect of the
situation

Is the cause something that is:
(2)
Controllable by 9 8 7 6 5 4 3 2 1 Uncontrollable
by you

(3)
Permanent 9 8 7 6 5 4 3 2 1 Temporary

(4)
Intended by you 9 8 7 6 5 4 3 2 1 Unintended
by you

(5)
Outside of you 1 2 3 4 5 6 7 8 9 Inside
of you

(6)
Variable over time 1 2 3 4 5 6 7 8 9 Stable over
time

(7)
Something about 9 8 7 6 5 4 3 2 1 Something
about you about others

(8)
Changeable 1 2 3 4 5 6 7 8 9 Unchanging

106
Is this cause something for which:
(9)
No one is 1 2 3 4 5 6 7 8 9 Someone is responsible
responsible

Is the cause
(10)
Something that 9 8 7 6 5 4 3 2 1 Something that
will affect other that will not
grades in this course affect other grades

(11)
Something that 9 8 7 6 5 4 3 2 1 Something that
will affect grades that will not
in other courses affect grades
in other courses

(12)
Something that 9 8 7 6 5 4 3 2 1 Something that
will affect other that will not
areas in your life affect other areas
in your life

Adapted from:

of how individuals perceive causes. *Journal of
Personality and Social Psychology, 42*, 1137-1145.

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APPENDIX F

DEBRIEFING STATEMENT

Thank you very much for your participation in this investigation. Your collaboration on such projects is vital to the advancement of psychology. Since you are participating in this experiment for educational purposes, I would like to explain some of what you experienced today and also give you a chance to ask questions. There are two concepts or constructs that this study is examining in relation to each other. One thing we studied was your level of confidence for various academic tasks, which represents self-efficacy expectations. Self-efficacy is expected to positively relate to higher grades and persistence in college. The measure that asked you to explain why you got your particular midterm grade was measuring your attribution for that outcome. We are interested in whether attributions for your grade would relate to your self-efficacy for the psychology course and school in general.

If you are interested in a summary of this study, please write your parents' or some other permanent address on the sheet provided, because it sometimes takes a year or more to complete such a project. Are there any questions or concerns?