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Sara Elizabeth Dittoe
University of Dayton

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ARE MEASURES OF SELF-EFFICACY MORE REACTIVE IN
NON-ASSERTIVE INDIVIDUALS THAN IN
ASSERTIVE INDIVIDUALS?

Thesis

Submitted to

The College of Arts and Sciences of the
UNIVERSITY OF DAYTON

In Partial Fulfillment of the Requirements for

The Degree

Master of Arts in Psychology

by


Sara Elizabeth Dittoe

UNIVERSITY OF DAYTON

Dayton, Ohio

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APPROVED BY:



Roger N. Reeb, Ph.D.
Chairperson, Thesis Committee




John R. Korte, Ph.D.
Thesis Committee Member



Charles E. Kimble, Ph.D.
Thesis Committee Member

CONCURRENCE:



David W. Biers, Ph.D.
Chairperson, Department of Psychology

ABSTRACT

ARE MEASURES OF SELF-EFFICACY MORE REACTIVE IN NON-ASSERTIVE INDIVIDUALS THAN IN ASSERTIVE INDIVIDUALS?

Dittoe, Sara Elizabeth
University of Dayton, 2003

Advisor: Dr. Roger N. Reeb

This thesis examined the problem of reactivity in the assessment of Albert Bandura's self-efficacy construct. In particular, research questions regarding whether self-efficacy measures were more reactive for individuals who were low in assertiveness were explored. Participants included university undergraduates who scored either high or low on a self-report measure of assertiveness. Once selected, participants were assigned to either a control group, or an experimental (self-efficacy) group. Participants in both the experimental and the control groups were asked to complete a series of performance tasks. Throughout the procedure, the experimental group also reported their self-efficacy estimations for the performance tasks a total of 14 times, while the control group reported their self-efficacy estimations only five times. The results of this study support Bandura's position that the self-efficacy measure is not reactive. Theoretical implications of these findings are discussed and suggestions for further research are presented.

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CHAPTER I

INTRODUCTION

This thesis explored the problem of reactivity in the assessment of Albert Bandura's self-efficacy construct. Specifically, this study addressed hypotheses presented in a recently published study by Altum and Reeb (1999). The Introduction first defines and describes self-efficacy and provides an overview of research on the construct. Next, the problems relating to the issue of reactivity in psychological assessment are described, followed by a review of research on the problem of reactivity in the assessment of self-efficacy. The Introduction concludes with the purpose and delineates the research question of the present study.

Self-Efficacy Theory

Definition

In 1977, Albert Bandura first introduced the concept of self-efficacy. He has defined the term as the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (1997, p. 3). Stated simply, this construct refers to one's perceived ability to accomplish a goal. The concept of self-efficacy is unique, and this uniqueness can be illustrated by comparing and contrasting it with related constructs.

The terms "self-esteem" and "self-efficacy" have been used interchangeably in the past. However, Bandura (1997, p. 11) gives the following differentiation: "Perceived self-efficacy is concerned with the judgments of personal capability, whereas self-esteem is concerned with self-worth." It is also important to distinguish "outcome" expectations from "self-efficacy" expectations. Although related, these are also two different constructs. Bandura's (1997, p. 21) differential definition of the two concepts is as follows: "Perceived self-efficacy is a judgment of one's ability to organize and execute given types of performances, whereas an outcome expectation is a judgment of the likely consequence such performances will produce." Similarly, Schwartzer (1992, p. ix) states that outcome expectancies "refer to the possible consequences of one's action," while self-efficacy expectancies "refer to personal action control or agency."

When illustrating the difference between self-efficacy and outcome expectancies, it is also important to discuss the relationship between them. As Kirsch (1995, p. 331) states, "self-efficacy is a judgment about personal capabilities that is intimately tied to expectancies about the outcome of contemplated actions." The combination of outcome expectancies and self-efficacy expectancies influences behavior. Thus, an individual may believe that a specific action will lead to a successful outcome, but if he or she has doubts about his or her ability to perform that action, the specific behavior may not be initiated.

Sources of Information

According to Bandura's (1977) social cognitive analysis, an individual's self-efficacy regarding a situation is based on four sources of information: relevant past

performance accomplishments, relevant past vicarious experiences (e.g. encouragement or discouragement), verbal persuasion, and anticipatory emotional arousal.

Performance Accomplishments. Performance accomplishments (also referred to as enactive mastery experiences) have been shown to be more influential than the other three sources of information (Bandura, 1997). These experiences signify one's personal competence in a given situation and are thought to be the most genuine source of information available to determine one's likelihood of future success. As reviewed by Bandura (1977; 1997), research suggests that successes increase efficacy expectations and failures lower them. This is especially true if the failures occur early, before one's sense of self-efficacy for a particular situation has been strongly formed. Bandura also states, "Once established, enhanced self-efficacy tends to generalize to other situations..." (1977, p. 195).

Vicarious Experiences. Personal mastery experiences, although most important, are not the only source of information from which people base judgments of self-efficacy. Vicarious experiences refer to an individual's past observation of others attempts to perform the behavior in question. Personal efficacy expectations can increase after seeing others perform well in intimidating situations (Bandura, 1977). Thus, modeling also plays an important role in the development of one's perceived ability to accomplish a goal (Bandura, 1977, 1997). Bandura (1997) shows that the level of benefit an individual gains from vicarious experiences depends in part on the type of model observed. Masterly models are individuals who flawlessly perform a given task with skill and ease. Coping models, on the other hand, are able

to effectively perform the task only after coping efforts have been initiated.

Individuals may benefit more from observing coping models who overcome initial obstacles and succeed through hard work (Kazdin, 1973; Meichenbaum, 1971). In addition, more benefit is gained when the model is similar to the observer (Kazdin, 1974), and when a number of different models are observed, rather than seeing repeat performances by the same model (Bandura & Menlove, 1968, Kazdin, 1974, 1975, 1976).

Verbal Persuasion. Persuasion from others also impacts one's thoughts that they are capable of successfully executing actions required to accomplish a goal. Although verbal persuasion alone is a much weaker source of information than performance accomplishments, positive statements from others can, in the face of obstacles, produce greater effort than when someone only focuses on the adversity of a situation and their own lack of assurance. However, if the positive verbal persuasions are not accompanied by behavioral or other changes to facilitate success, any resulting failures are likely to lead to a lack of trust in the persuaders and a general decrease in personal efficacy for that situation (Bandura, 1977, 1997).

Emotional Arousal. Emotional arousal (also labeled physiological and affective states) is the final source of information that contributes to an individual's self-efficacy. According to Bandura, people in stressful or demanding situations evaluate personal levels of anxiety and vulnerability for failure by taking physiological and emotional states into consideration. Extremely high levels of arousal can hinder performance; therefore, individuals experiencing extreme levels of physiological arousal may be less likely to expect success than those who are more

relaxed. These feelings of diminished self-efficacy, in turn, can cause greater feelings of anxiety and fear. Thus, there becomes a vicious cycle, which may possibly lead to failure of obtaining the goal in question (Bandura, 1977, 1997).

Development of Self-Efficacy: The Principle of Reciprocal Determinism

When explaining the development of self-efficacy, Bandura hypothesizes that internal factors (e.g., self-efficacy), behavior, and environmental factors have a bi-directional relationship with one another (Bandura 1978, 1997). He conceptualizes this relationship in terms of reciprocal determinism:

In the...process of reciprocal determinism, behavior, internal personal factors, and environmental influences all operate as interlocking determinants of each other...in a triadic reciprocal interaction...For example, people's efficacy...expectations influence how they behave, and the environmental effects created by their actions in turn alter their expectations... (1978, p. 346).

The influence that each determinant has on the others varies according to the situation; therefore, the causal effects of each determinant are not necessarily equal in strength (Bandura, 1997).

Major Conclusions from Research on Self-Efficacy

According to Bandura's most recent review (1997), twenty years of research has shown support for his original hypothesis that "...expectations of personal efficacy determine whether coping behavior is initiated, how much effort will be expended, and how long it will be sustained in aversive circumstances..." (1977, p. 191). In a discussion of self-efficacy research, Reeb et al. conclude:

...across various types of circumstances, situations, and populations, the research indicates that: (1) self-efficacy for coping in a given situation improves over the course of an intervention; and (2) post-intervention self-efficacy is (a) positively correlated with future performance attainments in the situation and (b) inversely correlated with anxiety (and other debilitating emotional states) during performance (1998, p. 48).

Reactivity in Assessment

In clinical research, it is possible for certain characteristics of an assessment measure to influence a participant's behavior. According to Kazdin (1992), an assessment measure is *obtrusive* if participants are aware that their behavior is being evaluated. In addition, Kazdin states that an assessment measure is *reactive* if this "awareness of assessment leads people to respond differently from how they would usually respond" (1992, p. 31). Critics of self-efficacy argue that measures of self-efficacy may have reactive effects. Specifically, in a discussion of the self-efficacy construct, Kazdin states that, "It is possible that completing a self-efficacy questionnaire is reactive in the sense that it subsequently influences the actual task that subjects will attempt when completing the behavioral test" (1978, p.181). Bandura also states (1997, p. 46) that, "In simple actions that can be produced at will, stating an efficacy judgment might, in itself, affect performance." Different problems may potentially lead to reactivity in self-efficacy.

Demand Characteristics and Subject Roles

Orne (1962) first described demand characteristics as cues providing participants with information about what behaviors are expected or preferred from them. Participants can obtain these cues from the experimental instructions, environment, procedure, or specific qualities of the experimenters themselves. When measuring self-efficacy, one possible reactivity cue that participants may become aware of is the expectation that they match their behavior with their reported level of self-efficacy. Hence, Borkovec (1978, p. 168) states: "Once ratings are made, the

person creates a demand (a discriminative stimulus) for behaviorally matching overt responses to predicted responses.” Similarly, when discussing self-efficacy assessment, Eysenck (1978, p.174) argues, “there may be... an element of self-fulfilling prophecy,” and Lang (1978, p.168) questions, “To what extent does the verbalization of one’s intentions formulate them and control what occurs?” Although these questions arose shortly after the concept of self-efficacy was first introduced (Bandura, 1977), relatively few studies have investigated the degree to which self-efficacy measures are reactive.

Kazdin (1998) also reviews the different ways in which subjects may respond to different experimental cues. These subject roles “reflect how the subject intends to respond to the task or problem of the experiment” (p. 339). Several categories of subject roles have been described, including good, apprehensive, faithful, and negativistic. The “good” participant is one who attempts to behave in ways that validate the experimenter’s hypothesis. The “apprehensive” participant is concerned that his or her behavior will be used to judge their abilities or personal characteristics. Hence participants in this subject role will attempt to present themselves favorably. The “negativistic” participant behaves in ways to refute the experimenter’s hypothesis. Finally, the “faithful” participant will carefully follow the experimenter’s instructions and will avoid letting their suspicions about the purpose of the experiment influence their behavior.

Reactivity as a Method Factor

Kazdin (1998) also discusses reactivity as a methods factor. Campbell and Fiske’s (1959) multitrait-multimethod matrix first suggested that the magnitude of the

correlation between two variables might be increased if the measures of the two variables are similar in method (e.g. two self-report Likert-like measures or two self-report true-false measures). One criticism of self-efficacy assessment that Kazdin (1978) makes is the possibility that high correlations between self-efficacy and behavior is due in part to a similarity in method of assessment of the two variables.

Test Sensitization

According to Kazdin (1998), if the administration of an assessment instrument before or after treatment influences the effects of that treatment, it is thought that the instrument *sensitizes* participants. An instrument that causes this type of sensitization is considered reactive. *Pretest sensitization* refers to the possible enhancing or detracting effects that the administration of an instrument prior to treatment may have on performance. Similarly, *posttest sensitization* refers to changes in performance due to the administration of an instrument after treatment. Hence, it has been proposed that self-efficacy assessment may actually enhance treatment effects. For example, measuring self-efficacy before or after treatment may alter participants' expectations of treatment or may make the purpose of the intervention more salient.

Reactivity in Self-Efficacy Assessment Research

Cervone's (1989) study was one of the few attempts to examine reactivity in self-efficacy assessment. However, the issue of reactivity was addressed as only one part of his investigation of the influence of differing levels of task information on self-efficacy judgments regarding task completion. This study included 128 participants who were randomly assigned to one of six conditions in a three by two factorial design consisting of: (1) three types of information which described the tasks

(difficult, easy, or no description); and (2) two different amounts of background information (low or high). After participants were given the designated information, they reported their self-efficacy judgments and then performed the tasks. Participants who were told that the tasks were difficult had significantly lower levels of perceived self-efficacy as well as lower task persistence than those who were told the tasks were easy. Male participants had significantly higher levels of self-efficacy than female participants, with differences being more prominent for those in receipt of a high level of information versus those in receipt of a low level of information. Otherwise, the level of background information did not significantly affect efficacy expectations. These results were interpreted as evidence that task information had an influential role on the formation of efficacy judgments.

To test reactivity, 32 participants were placed in the difficult task/high background information condition and 32 participants were placed in the easy task/high background information condition. These conditions were used because it was anticipated that these circumstances would cause extreme levels of perceived self-efficacy and task persistence, depending on whether the information revealed that the tasks were easy or difficult. In each of the two conditions, 16 participants were not asked to record their self-efficacy judgments. There were no significant differences in task persistence between the groups who completed the self-efficacy measure and those who did not. These results were interpreted as evidence that recording self-efficacy judgments did not affect task performance.

It is important to point out several shortcomings in this study. First, only 64 of the 128 participants were used to test reactivity. This number is small enough to

question the level of statistical power in this study. Second, the reactivity cues possibly present in Bandura's treatment studies (Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977; Bandura, Reese, & Adams, 1982) do not appear to be present in Cervone's study. In other words, the participants could not have been given cues that would encourage them to improve in a therapy program, because Cervone's study does not use a treatment model. Third, the determination of whether the high correlation between self-efficacy and behavioral performance was influenced by reactivity is not possible, since self-efficacy was never measured in the comparison group. To address the issue of reactivity, an extra step would be needed, with self-efficacy and performance measured after the post-treatment behavioral assessment. With this extra step, the two groups could be compared to determine if there were any additional improvements in performance that could be attributed to the self-efficacy assessment.

In addition, Cervone recognized two methodological problems in this study that limit the likelihood of identifying reactivity effects. First, participants who were utilized to explore reactivity were all given a high level of task information. In other words, the "low information" and "no information" groups were left out of this part of the study. A high level of task information could lead participants to assess their mental abilities before actually attempting the task. Cervone stated that, because of this, a measure of perceived confidence about these abilities (e.g. a measure of self-efficacy) is not likely to show any reactivity effects that go significantly beyond the effects of providing a high level of information. Second, participants were required to decide how to divide their time on two challenging tasks, cyclical graphs and

anagrams, to maximize the number of correctly completed tasks. The cyclical graphs were geometric figures that could be traced in such a way that one's pencil would not have to be raised from the page and no line would be traced more than once. The anagrams were scrambled words that could be arranged into common English words. This procedure required participants to make decisions about dividing their attention, and may also have served the same purpose of self-efficacy assessment. In other words, it is possible that this procedure could lead participants to mentally assess their confidence and abilities, even if the experimental instructions did not specifically ask them to do so. In brief, it may be argued that the methodological problems noted above in Cervone's study make his results inconclusive.

According to Bandura's (1997) review, "numerous tests for reactive effects of self-assessment show that people's affective reactions and performance attainments are the same regardless of whether they do or do not make prior efficacy judgments" (Bandura, 1997, p. 46). Self-efficacy assessment has been found to be non-reactive in studies describing a variety of activities, such as behavior and anxiety arousal (Bandura, Adams, Hardy, & Howells, 1990), regulation of motivation (Bandura and Cervone, 1983, 1986), cognitive accomplishments (Brown & Inouye, 1978), and recovery of functioning after coronary surgery (Thomas, 1993). Studies thus far have also found that efficacy judgments are not influenced by participants' desire to appear socially acceptable, as evidenced by Stotland and Zuroff's (1991) study of dietary practices and Grossman, Brink, and Hauser's (1987) study of self-management of diabetes. In addition, performances have been found to be unaffected by whether

people make their efficacy judgments publicly or privately (Gauthier & Ladoucer, 1981).

Bandura (1997) argues that a study by Telch, Bandura, Vinciguerra, Argas, and Stout (1982) provides the most conclusive evidence that making efficacy judgments does not increase the correlation between perceived self-efficacy and performance. In this study, phobics made efficacy judgments either under high social demand for consistency or under the pretense that no one would see their efficacy judgments (low social pressure for consistency). However, those in the low social pressure category unwittingly left behind a copy of their efficacy judgments on carbon paper. Contrary to consistency theory, high social demands reduced rather than increased congruence between efficacy judgments and performance. Under high social scrutiny, participants became more conservative in their efficacy judgments. Bandura argues that if the participants' actions were controlled by a concern for consistency, they could have easily matched their performance with their self-efficacy assessment by stopping when their performance matched their efficacy judgment. Instead, participant performance often exceeded previous self-efficacy judgments.

Lee's (1984) publication regarding assessment of reactivity in assertiveness training included two experiments. In the first experiment, 47 non-assertive female college students participated in a series of assertiveness training sessions for 6 weeks. Participants were considered non-assertive if they scored at least one half of a standard deviation below the mean on the College Self-Expression Scale (CSES). During each session, the participants made efficacy predictions regarding their performance in specific situations and then role-played those situations. In the

stimulus situation, participants listened to an audiotape consisting of a number of situations requiring an assertive response. At the end of each situation, participants were given 60 seconds to give an appropriate assertive response. To measure self-efficacy, each participant stated whether or not she believed she could handle the situation in an appropriate way and, if so, she rated her confidence on a scale from zero (quite uncertain) to 100 (certain).

In the first, second, and sixth weeks, efficacy expectations were measured for all role-play situations. However, in the third, fourth, and fifth weeks, efficacy expectations were measured for only half of the role-play situations. It was found that measuring self-efficacy had some reactive effects on later behavior. Specifically, participants' performance was enhanced in terms of greater assertiveness, greater appropriateness of response, and shorter response latency if self-efficacy measurements had been administered. However, the initial large, positive, reactive effects tended to decrease over time.

In Lee's second experiment, 60 college females were randomly selected to ensure that a wide range of assertiveness levels would be obtained. Each student participated in one role-play session that was similar to those described in the first experiment. Half of these students completed a self-efficacy questionnaire for all the role-play items, while the other half did not. Participants also were divided into three groups based on their assertiveness scores on the CSES (low, medium, and high assertiveness). Results again showed a simple enhancing reactive effect of completing the self-efficacy questionnaire. Specifically, those who completed the self-efficacy questionnaire showed significantly greater appropriateness of response and shorter

response latency. However, in this study, there was no significant effect of level of assertiveness on performance.

A recent study by Altum and Reeb (1999) is one of the few studies that had as a sole purpose the examination of reactivity in self-efficacy assessment. This study attempted to determine whether the relationship between self-efficacy and behavioral performance was due to reactivity effects. In this study, 52 undergraduate students who indicated a particular fear (i.e., fear of a laboratory rat) on a self-report measure (the Fear Survey Schedule; Wolpe & Lang, 1977) were randomly assigned to a self-efficacy group or a routine treatment group. To measure fear, a Behavioral Approach Test (Bandura et al., 1980) was employed. The Behavioral Approach Test is composed of 10 tasks, which range from relatively low stress interactions with a rat (i.e., approaching the cage) to high stress interactions (i.e., holding the rat with bare hands). The intervention included viewing a filmed modeling procedure where five coping models completed the Behavioral Approach Test while expressing fear and ways to cope with this fear.

In the self-efficacy group, a self-efficacy measure was administered to participants before, during, and after intervention, and at follow-up. The routine treatment group completed the self-efficacy measure at follow-up only. The contrast in procedure for the two groups allowed for an examination of the extent to which self-efficacy assessment enhanced or detracted from the effect of the intervention. The follow-up assessment allowed for an examination of whether the correlation between performance and self-efficacy was greater for participants with practice in self-efficacy assessment. Outcome assessment of fear included self-report measures

of anticipatory and performance fear, as well as a behavioral approach task. A postexperimental inquiry was also utilized to examine participants' perception of the purpose of the self-efficacy measure. In general, the results of this study did not support the hypothesis that measures of self-efficacy are reactive.

The results of the Altum and Reeb study are congruent with most other published findings, but are inconsistent with Lee's studies of assertiveness training (1984), which focused on participants who are known to be non-assertive, and did yield evidence of reactivity in self-efficacy assessment. Given these contradictory findings, Altum and Reeb proposed the following hypothesis: "One possible explanation... is that nonassertive individuals tend to misinterpret self-efficacy assessment as social pressure and then behave (comply) accordingly" (1999, p. 702).

Purpose of Present Study

The purpose of the present study was to examine the problem of reactivity in the measurement of self-efficacy in non-assertive versus assertive participants. In this study, we examined the following research question: When using a self-efficacy measure, are reactivity effects more likely to occur with non-assertive than with assertive participants?

CHAPTER II

METHOD

Participants

Participants included 109 undergraduate students (44% male and 56% female) at the University of Dayton who each received course credit for participation.

Participants were selected based on their score on an assertiveness measure and then randomly placed in either the self-efficacy group or the control group. Informed consent was obtained prior to participation, and debriefing was provided following participation.

Materials

College Self-Expression Scale. The College Self-Expression Scale (CSES; see Appendix A) was used to classify participants as either high or low in assertiveness. The CSES is a 50 item self-report inventory designed to measure assertiveness in college students. It uses a five-point Likert scale format ranging from 0 ("almost always") to 4 ("never or rarely"), with 29 negatively worded items and 21 positively worded items. A total assertiveness score was obtained by summing all positively worded items and reverse scoring and summing all negatively worded items. Possible scores can range from 0 to 200. Low scores indicate a nonassertive pattern of response. As in previous studies (e.g. Lee, 1984), participants were placed

in the "non-assertive" condition if they scored at least one half a standard deviation below the mean and participants with scores equal to or greater than the mean were placed in the "high assertiveness" condition.

Test-retest reliability data were collected for two samples of students at West Virginia University (91 undergraduate students and 47 graduate students) over a two-week period. The test-retest reliability coefficients for the two samples were .89 and .90. Concurrent validity was established by correlating the CSES with the Adjective Check List (Gough & Heilbrun, 1965), which consists of 300 common adjectives that comprise 24 personality scales. The Adjective Check List was administered to 72 of the 91 undergraduate students and results found that the CSES correlated positively with Adjective Check List subscales that were thought to characterize assertiveness (i.e., Number checked, Defensiveness, Favorable, Self-Confidence, Achievement, Dominance, Intraception, Heterosexuality, Exhibition, Autonomy, and Change) and negatively with the subscales that were thought to indicate nonassertiveness (i.e., Unfavorable, Succorance, Abasement, Deference, and Counseling Readiness). Concurrent validity was established by correlating CSES scores of 121 student teachers with ratings of their assertiveness made by their supervisors. The correlation between CSES scores and supervisor ratings was statistically significant.

Performance Tasks. Performance tasks such as cyclical graphs and anagrams have been used previously in the assessment of self-efficacy (Cervone, 1989). For replication purposes, the same cyclical graphs were obtained from Cervone (Personal Communication, Sept. 18, 2002) and were utilized in the present study (see Appendix B). The cyclical graphs are geometric figures that can be traced in such a way that

one's pencil does not have to be raised from the page and no line is traced more than once. Twenty-five cyclical graphs were utilized and were arranged as follows: the first cyclical graph is very easy; graphs 2-10 are increasingly challenging, yet solvable; and the final 15 graphs are unsolvable. The cyclical graphs were printed on 4"x 5" pieces of paper and participants were given 15 seconds to solve each graph.

The anagrams used were similar in nature to those used in Cervone's study. An attempt was made to obtain the exact same anagrams, but Cervone (Personal Communication, Sept. 18, 2002) stated that the anagrams were no longer available. Consequently, anagrams were selected from a puzzle book (Hoyt & Hoyt, 2001) that matched the description in Cervone's study (1989). The anagrams used in this study were five or six letters that can be rearranged to form a common English word (see Appendix C). Twenty-six anagrams were utilized: approximately half of which were five letters in length and half of which were six letters in length. Similar to the procedure used with the cyclical graphs tasks, the anagrams were printed on 4"x 5" pieces of paper and participants had 15 seconds to complete each task.

Self-Efficacy Measure. The instrument used to measure self-efficacy was similar to the one used in Cervone's (1989) assessment of perceived self-efficacy. Items in this measure assessed participants' judgments of their abilities to attain certain levels of performance on the cyclical graphs and anagrams (see Appendix D). Strength of perceived self-efficacy was assessed by having participants rate the strength of their expectations on a 100-point scale, ranging from low levels of confidence to complete certitude. Participants rated the degree of certainty that they could solve 0-10%, 11-20%, 21-30%, 31-40%, 41-50%, 51-60%, 61-70%, 71-80%,

81-90%, and 91-100% of the performance tasks. The self-efficacy measure (Appendix D) was used to assess the participant's level of self-efficacy several times during the completion of the performance tasks and after all performance tasks had been completed. The self-efficacy score was calculated by summing all ratings. Possible scores range from 100 to 1,000.

Postexperimental Inquiry. As recommended by Kazdin (1992), a post-experimental inquiry was utilized to assess participants' perceptions relating to the role of and the reason for the self-efficacy measure. This inquiry was similar to the instrument utilized by Altum and Reeb (1999; see Appendix E), and was used as an investigative, supplemental procedure in an attempt to examine evidence of reactivity. To investigate participants' perceptions of the self-efficacy measure, the inquiry included: (a) one open-ended question, with responses written by the participants; and (b) six Likert-like items. Kazdin (1992) reviews similar approaches that have been used to detect reactivity in psychological assessment.

Procedure

Data collection began only after the study was approved by the Research Review and Ethics Committee. In group testing, participants were given the College Self-Expression Scale to measure assertiveness. As in past studies (i.e., Lee, 1984), those scoring at least one half of a standard deviation below the mean were classified into the low assertiveness group. We classified individuals as high in assertiveness by using a cutoff score equal to or greater than the mean. Additionally, participants with scores lower than the scores used by Lee were selected for the low assertiveness

group. Those selected as either low assertives or high assertives were randomly assigned to (1) the self-efficacy group or (2) the control group.

All participants were asked to complete a series of performance tasks comprised of cyclical graphs and anagrams. As stated earlier, 25 cyclical graphs were utilized and were arranged as follows: the first cyclical graph was very easy; graphs 2-10 were increasingly challenging, yet solvable; and the final 15 graphs were unsolvable. In addition, 26 anagrams were utilized and were arranged as follows: the first 14 were comprised of five letters and the last 12 were comprised of six letters. All anagrams used were solvable.

Participants in the self-efficacy group were first told that they were going to attempt a number of anagrams. They were then given a brief description of the task and told that they would have 15 seconds to complete each anagram (see Appendix F for the instruction script). After 15 seconds had elapsed, the experimenter called "Time," and the participants moved on to the next task. The participants also were asked to complete a self-efficacy measure after completing the first anagram, after anagram 6, after anagram 11, after anagram 16, after anagram 21, and after anagram 26. Participants were then told that they were going to attempt a number of cyclical graphs. Again, they were given a brief description of the task and told that they had 15 seconds to complete each task (see Appendix G for the instruction script). They also were asked to complete a self-efficacy measure multiple times during completion of the solvable graphs: after the first cyclical graph, after graph 3, after graph 5, after graph 7, and after graph 10, as well as during the 15 unsolvable cyclical graphs: after graph 15, after graph 20, and after graph 25.

Participants in the control group went through the same procedure as those in the self-efficacy group, with this exception: they were only asked to complete the self-efficacy measure five times: after completion of the first 21 anagrams, after completion of all the anagrams, after completion of the first seven solvable cyclical graphs, after completion of all the solvable cyclical graphs, and after completion of the 15 unsolvable cyclical graphs. Both groups then completed the post-experimental inquiry in order to assess participants' perceptions regarding the purpose and function of the self-efficacy measure. Following the post-experimental inquiry, participants were debriefed.

CHAPTER III

RESULTS

This section will include four main subsections. The first main subsection will examine group differences in performance by utilizing a 2 x 2 analysis of variance (ANOVA) with group (control vs. self-efficacy) and assertiveness (low vs. high) as the between-subjects factors. In other words, these analyses attempted to determine whether repeated administration of the self-efficacy measure enhanced or detracted from task performance, especially for low assertive participants. The second main subsection will examine group differences in self-efficacy measures by again utilizing the 2 x 2 ANOVA. That is, these analyses examined the extent to which repeated administration of the self-efficacy scale was reactive in ways that influenced participants in the direction of reporting a higher level of self-efficacy subsequently. In particular, there was an interest in whether this evidence of reactivity would be more likely observed in participants with low assertiveness. The third main subsection will examine group differences in the correlation between self-efficacy and performance. In other words, these analyses attempted to determine whether repeated administration of the self-efficacy scale accompanied by repeated task performance would be reactive by leading to an increasingly higher correspondence between self-efficacy estimations and performance. Again, there was an interest in determining if this pattern of results would be more likely to occur with low assertive

individuals. Finally, the fourth main subsection will use the 2 x 2 ANOVA to examine group differences in the post-experimental inquiry scores. That is, these analyses attempted to determine whether repeated administration of the self-efficacy scale was perceived by participants in ways that allowed them to surmise the purpose of this specific procedure. These analyses also determined the extent to which participants attempted to comply in ways that are relevant to this perception of the procedure (i.e., repeated administration of the self-efficacy scale). Whether this was more likely to occur with low assertive individuals was of particular interest.

Evidence of Reactivity of the Self-Efficacy Measure on Task Performance

In this subsection, four 2 x 2 analyses of variance (ANOVAs) with assertiveness (low vs. high) as one between-subjects factor and group (self-efficacy group vs. control group) as the other between-subjects factor was utilized on the four dependent variables of: the number of the first seven cyclical graphs successfully completed, the total number of cyclical graphs successfully completed, the number of the first 21 anagrams successfully completed, and the total number of anagrams successfully completed. The purpose of these analyses was to determine whether repeated use of the self-efficacy measure enhanced or hindered task performance.

Analyses Involving Cyclical Graphs. In the first analysis, the dependent variable was the number of the first seven cyclical graphs successfully completed. At this point, participants in the control group had not completed any self-efficacy measures regarding completion of the cyclical graphs. Conversely, participants in the self-efficacy group had completed the self-efficacy measure three times. The interaction between assertiveness and group was nonsignificant, $F(1, 105) = .33, p = .57$. The means and standard

deviations for the four groups are reported in Table 1. Regarding the main effect of group, the difference between the self-efficacy group ($\underline{M} = 5.40$, $\underline{SD} = 1.74$) and the control group ($\underline{M} = 5.18$, $\underline{SD} = 1.72$) on cyclical graph performance was nonsignificant, $\underline{F}(1, 105) = .47$, $p = .50$. With regard to the main effect for assertiveness, the difference between the low assertive participants ($\underline{M} = 5.02$, $\underline{SD} = 1.85$) and the high assertive participants ($\underline{M} = 5.63$, $\underline{SD} = 1.50$) closely approached significance, $\underline{F}(1, 105) = 3.38$, $p = .07$.

In the second two by two ANOVA, the dependent variable was the total number of cyclical graphs successfully completed. Because the last 15 cyclical graphs were unsolvable, this measure was conducted after participants had completed only the first 10 (solvable) cyclical graphs. At this point, the control group had completed the self-efficacy measure only once, while the self-efficacy group had completed the measure four times. Again, the interaction between assertiveness and group was nonsignificant, $\underline{F}(1, 105) = .06$, $p = .82$. The means and standard deviations for the four groups are reported in Table 2. Likewise, the difference between the self-efficacy group ($\underline{M} = 6.80$, $\underline{SD} = 2.20$) and the control group ($\underline{M} = 6.43$, $\underline{SD} = 2.25$) on cyclical graph performance was nonsignificant, $\underline{F}(1, 105) = .70$, $p = .40$, as was the difference between the low assertive participants ($\underline{M} = 6.28$, $\underline{SD} = 2.31$) and the high assertive participants ($\underline{M} = 7.02$, $\underline{SD} = 2.05$), $\underline{F}(1, 105) = 2.97$, $p = .09$.

Analyses Involving Anagrams. A third 2 x 2 ANOVA was employed with the number of the first 21 anagrams successfully completed as the dependent variable. At this point the participants in the self-efficacy group completed the self-efficacy measure

Table 1

Means and Standard Deviations for Cyclical Graph (First Seven
Graphs) Performance as a Function of Group and Assertiveness Level

<u>Group</u>	<u>Mean</u>	<u>Standard Deviation</u>
Self-efficacy		
Low assertives	5.03	1.85
High assertives	5.83	1.46
Control		
Low assertives	5.00	1.88
High assertives	5.42	1.53

Means and standard deviations for the first seven cyclical graphs

Table 2

Means and Standard Deviations for Cyclical Graph (First 10 Graphs
Performance as a Function of Group and Assertiveness Level

<u>Group</u>	<u>Mean</u>	<u>Standard Deviation</u>
Self-efficacy		
Low assertives	6.43	2.18
High assertives	7.25	2.13
Control		
Low assertives	6.13	2.46
High assertives	6.79	1.98

Means and standard deviations for the first ten cyclical graphs

regarding the anagram tasks five times. The control group had not completed the measure at this point. In this analysis, the interaction between assertiveness and group was nonsignificant, $F(1, 105) = .03, p = .87$. See Table 3 for the means and standard deviations for the four groups. Regarding the main effect of group, the difference between the self-efficacy group ($M = 10.06, SD = 3.40$) and the control group ($M = 10.48, SD = 3.62$) on anagram performance was nonsignificant, $F(1, 105) = .56, p = .46$. With regard to the main effect for assertiveness, the difference between the low assertive participants ($M = 10.49, SD = 3.41$) and the high assertive participants ($M = 10.00, SD = 3.63$) was also nonsignificant, $F(1, 105) = .25, p = .62$.

Lastly, a fourth 2×2 ANOVA was employed. The dependent variable was the total number of anagrams successfully completed. At this point, the control group had completed the self-efficacy measure once and the self-efficacy group had completed the measure six times. Again, the interaction between assertiveness and group was nonsignificant, $F(1, 105) = .003, p = .95$. The means and standard deviations for the four groups are reported in Table 4. Correspondingly, the difference between the self-efficacy group ($M = 12.32, SD = 4.15$) and the control group ($M = 12.80, SD = 4.37$), $F(1, 105) = .31, p = .58$ on anagram performance was nonsignificant, as was the difference between the low assertive participants ($M = 12.79, SD = 4.28$) and the high assertive participants ($M = 12.29, SD = 4.31$), $F(1, 105) = .34, p = .56$.

Evidence of Reactivity of Self-Efficacy Measures on Subsequent Estimations of Self-Efficacy

In this subsection, five 2×2 analyses of variance (ANOVAs) with assertiveness (low vs. high) as one between-subjects factor and group (self-efficacy group vs. control

Table 3

Means and Standard Deviations for Anagram Performance (First 21 Anagrams) as a Function of Group and Assertiveness Level

<u>Group</u>	<u>Mean</u>	<u>Standard Deviation</u>
Self-efficacy		
Low assertives	10.13	3.12
High assertives	9.88	3.75
Control		
Low assertives	10.84	3.70
High assertives	10.13	3.59

Means and standard deviations for the first 21 anagrams

Table 4

Means and Standard Deviations for Anagram Performance (Total Number of Graphs) as a Function of Group and Assertiveness Level

<u>Group</u>	<u>Mean</u>	<u>Standard Deviation</u>
Self-efficacy		
Low assertives	12.40	4.09
High assertives	12.08	4.27
Control		
Low assertives	13.16	4.39
High assertives	12.50	4.43

Means and standard deviations for the total number of anagrams

group) as the other between-subjects factor was utilized on the dependent variables of: self-efficacy ratings after completion of the first seven solvable cyclical graphs, self-efficacy ratings after the completion of all solvable cyclical graphs, self-efficacy ratings after completion of the unsolvable cyclical graphs, self-efficacy ratings after completion of the first 21 anagrams, and self-efficacy ratings after the completion of all anagrams. The purpose of these analyses was to determine whether repeated use of the self-efficacy measure enhances or detracts from subsequent self-efficacy estimations.

Self-Efficacy for Cyclical Graphs. In the first analysis, the dependent variable was the self-efficacy score after completion of the first seven cyclical graphs. At this point the self-efficacy group had completed the self-efficacy measure regarding the cyclical graphs four times and the control group had completed the measure for the first time. The interaction between group and assertiveness was nonsignificant, $F(1, 105) = .43, p = .51$. The means and standard deviations for the four groups are reported in Table 5. Regarding the main effect for group, the difference between the self-efficacy group ($M = 698.08, SD = 186.48$) and the control group ($M = 730.04, SD = 190.21$) on self-efficacy scores was nonsignificant, $F(1, 105) = .76, p = .39$. However, there was a significant main effect of assertiveness on self-efficacy scores, where the low assertive participants ($M = 678.44, SD = 177.51$) had lower self-efficacy scores than the high assertive participants ($M = 760.31, SD = 193.25$), $F(1, 105) = .542, p = .02$.

In the second analysis, a 2 x 2 ANOVA was utilized with the self-efficacy score after completion all the solvable cyclical graphs as the dependent variable. At this point the self-efficacy group had completed the self-efficacy measure five times while the

Table 5

Means and Standard Deviations for the Self-Efficacy Measure (after the First Seven Graphs) as a Function of Group and Assertiveness Level

<u>Group</u>	<u>Mean</u>	<u>Standard Deviation</u>
Self-efficacy		
Low assertives	652.77	156.70
High assertives	756.46	203.74
Control		
Low assertives	703.29	194.90
High assertives	764.17	186.50

Means and standard deviations of the self-efficacy scores after completion of the first seven cyclical graphs

control group had completed the measure only twice. Once again, the interaction between assertiveness and group was nonsignificant, $F(1, 105) = .05, p = .82$. Refer to Table 6 for the means and standard deviations for the four groups. Additionally, the difference in self-efficacy scores between the self-efficacy group ($M = 644.81, SD = 174.94$) and the control group ($M = 631.16, SD = 212.34$) was nonsignificant, $F(1, 105) = .12, p = .73$. However, again there was a significant main effect of assertiveness, $F(1, 105) = 4.09, p = .05$ on self-efficacy scores, where those the low assertive participants ($M = 604.51, SD = 195.89$) had lower self-efficacy scores than the high assertive participants ($M = 680.06, SD = 185.71$).

A third 2×2 ANOVA was employed with the self-efficacy score after completion of the unsolvable cyclical graphs as the dependent variable. After completion of all the unsolvable cyclical graphs, the self-efficacy group had completed the self-efficacy measure regarding the graphs a total of eight times. In contrast, the control group had completed the measure three times. In this analysis, there was no significant interaction between assertiveness and group, $F(1, 105) = 1.70, p = .20$. The means and standard deviations for the four groups are reported in Table 7. With regard to the main effect of group, the difference in self-efficacy scores between the self-efficacy group ($M = 432.09, SD = 168.31$) and the control group ($M = 395.48, SD = 229.68$) was nonsignificant, $F(1, 105) = .121, p = .27$. Regarding the main effect of assertiveness, the difference between the low assertive participants ($M = 420.03, SD = 207.41$) and the high assertive participants ($M = 404.69, SD = 196.97$) was also nonsignificant, $F(1, 105) = .15, p = .70$.

Table 6

Means and Standard Deviations for the Self-Efficacy Measure (After the First 10 Graphs) as a Function of Group and Assertiveness Level

<u>Group</u>	<u>Mean</u>	<u>Standard Deviation</u>
Self-efficacy		
Low assertives	602.17	161.40
High assertives	690.83	181.92
Control		
Low assertives	606.84	227.04
High assertives	669.29	192.72

Means and standard deviations the self-efficacy scores after completion of the first 10 (solvable) cyclical graphs

Table 7

Means and Standard Deviations for the Self-Efficacy Measure (After All
Unsolvable Graphs) as a Function of Group and Assertiveness Level

<u>Group</u>	<u>Mean</u>	<u>Standard Deviation</u>
Self-efficacy		
Low assertives	411.33	159.28
High assertives	451.67	179.17
Control		
Low assertives	428.45	247.71
High assertives	357.71	206.33

Means and standard deviations of the self-efficacy scores
after completion of the unsolvable cyclical graphs

Self-Efficacy for Anagrams. In the fourth 2 x 2 ANOVA the dependent variable was the self-efficacy score after completion of the first 21 anagrams. At this point the self-efficacy group had completed the self-efficacy measure regarding the anagrams five times and the control group had completed the measure only once. The interaction between assertiveness and group was nonsignificant, $F(1, 105) = .003, p = .95$. Refer to Table 8 for the means and standard deviations for the four groups. The difference in self-efficacy scores between the self-efficacy group ($M = 530.02, SD = 190.99$) and the control group ($M = 604.00, SD = 205.25$) approached significance, but not in the expected direction, $F(1, 105) = 3.69, p = .06$. The difference in self-efficacy scores between the low assertive participants ($M = 560.36, SD = 208.88$) and the high assertive participants ($M = 577.19, SD = 192.15$) was also nonsignificant, $F(1, 105) = .23, p = .63$.

Finally, a fifth two by two ANOVA was employed with the self-efficacy score after completion of all the anagrams as the dependent variable. At this point the self-efficacy group had completed the self-efficacy measure regarding the anagrams six times and the control group had completed the measure two times. The interaction between assertiveness and group was nonsignificant, $F(1, 105) = .71, p = .40$. The means and standard deviations for the four groups are reported in Table 9. Also, regarding the main effect of group, the difference in self-efficacy scores between the self-efficacy group ($M = 570.68, SD = 190.20$) and the control group ($M = 590.71, SD = 224.72$) was nonsignificant, $F(1, 105) = .71, p = .40$. Similarly, with regard to the main effect of assertiveness, the difference in self-efficacy scores between the low assertive participants

Table 8

Means and Standard Deviations for the Self-Efficacy Measure (After First 21 Anagrams) as a Function of Group and Assertiveness Level

<u>Group</u>	<u>Mean</u>	<u>Standard Deviation</u>
Self-efficacy		
Low assertives	516.20	205.71
High assertives	538.96	174.72
Control		
Low assertives	603.10	206.21
High assertives	615.42	204.64

Means and standard deviations of the self-efficacy scores
after completion of the first 21 anagrams

Table 9

Means and Standard Deviations for the Self-Efficacy Measure (After All Anagrams) as a Function of Group and Assertiveness Level

<u>Group</u>	<u>Mean</u>	<u>Standard Deviation</u>
Self-efficacy		
Low assertives	558.70	205.25
High assertives	575.63	176.00
Control		
Low assertives	605.87	225.40
High assertives	582.00	226.15

Means and standard deviations of the self-efficacy scores
after completion of all the anagrams

($M = 582.67$, $SD = 215.24$) and the high assertive participants ($M = 578.81$, $SD = 200.49$) was nonsignificant $F(1, 105) = .71$, $p = .40$.

Correlations Between Self-Efficacy Scores and Performance

In this subsection, results pertaining to the general relationship between self-efficacy and performance are presented, as well as findings regarding specific group differences in this correlation coefficient.

Evidence of a General Relationship Between Self-Efficacy and Performance. Two correlational analyses were conducted to address the following basic question: In general, is there evidence of a relationship between self-efficacy and performance? First, across self-efficacy groups and across assertiveness levels, scores from the self-efficacy measure immediately preceding the last three cyclical graphs were correlated with performance (the number of those three cyclical graphs which were correctly completed). The correlation between scores from the self-efficacy measure and cyclical graph performance was not significant, $r = .13$, $p = .17$. Second, across self-efficacy groups and across assertiveness levels, scores from the self-efficacy measure immediately preceding the last five anagrams were correlated with performance (the number of those five anagrams which were correctly completed). The correlation between self-efficacy scores and anagram performance was significant, $r = .39$, $p < .001$.

Group Differences in the Relationship Between Self-Efficacy and Performance.

More specific correlations between self-efficacy and performance (broken down into high and low assertiveness levels as well as self-efficacy and control groups) are also presented below. Tables 10 and 11 provide an overview of these results for clarification purposes. Additionally, reactivity of the self-efficacy measure was examined by testing

Table 10

Correlation Between Cyclical Graph Performance and
Cyclical Graph Self-Efficacy Scores

<u>Group</u>	<u>r</u>	<u>p</u>
Self-efficacy		
Low assertives	-.088	.645
High assertives	.067	.755
Control		
Low assertives	.372	.040
High assertives	.242	.255

Table 11

Correlation Between Anagram Performance and Anagram
Self-Efficacy Scores

<u>Group</u>	<u>r</u>	<u>p</u>
Self-efficacy		
Low assertives	.497	.005
High assertives	.394	.057
Control		
Low assertives	.400	.026
High assertives	.075	.726

whether any of these correlation coefficients were significantly different from each other. In other words, was repeated administration of the self-efficacy scale coupled with repeated task performance reactive, resulting in an increasingly higher correlation between self-efficacy scores and performance? There was a special focus on determining if the magnitude of the correlation coefficient was greater for the low assertives in the self-efficacy group when compared to the other groups. Correlation comparisons were conducted by transforming each Pearson's r to a z -score and then testing for significance (Cohen, 2001). See Tables 12 and 13 for an overview of these results.

As summarized in Table 10, the correlation between self-efficacy scores and cyclical graph performance was significant for the low assertives in the control group. However, the correlation between self-efficacy scores and cyclical graph performance was nonsignificant for both the low assertives and the high assertives in the self-efficacy group as well as the high assertives in the control group. Additionally, a review of Table 12 indicated that, using the z -test, none of these correlations were significantly different from each other.

With regard to the anagrams, as summarized in Table 11, the correlation between the scores on the self-efficacy measure and performance was significant for the low assertives in the self-efficacy group and the low assertives in the control group. However, the correlation between self-efficacy scores and anagram performance was nonsignificant for the high assertives in both the self-efficacy and control groups. In addition, a review of Table 13 indicates that the z -test showed no significant differences between any of these correlation coefficients. However, the correlation between low assertives in the self-efficacy group and high assertives in the control group did approach significance.

Table 12

Results of Tests of Significance Between Correlation Coefficients for Cyclical Graphs

<u>Comparisons</u>	<u>z</u>	<u>p</u>
Correlation for Low Assertives in the Self-Efficacy Group vs. Correlation for High Assertives in Self-Efficacy Group	0.55	>.05
Correlation for Low Assertives in the Self-efficacy Group vs. Correlation for High Assertives in the Control Group	-1.822	>.05
Correlation for Low Assertives in the Self-Efficacy Group vs. Correlation for Low Assertives in the Control Group	-1.772	>.05
Correlation for High Assertives in the Self-Efficacy Group vs. Correlation for High Assertives in the Control Group	1.199	>.05
Correlation for Low Assertives in the Control Group vs. Correlation for High Assertives in the Self-Efficacy Group	-1.227	>.05
Correlations for Low Assertives in the Control Group vs. Correlations for the High Assertives in the Control Group	0.180	>.05

Table 13

Results of Tests of Significance Between Correlation Coefficients for Anagrams

<u>Comparison</u>	<u>z</u>	<u>p</u>
Correlation for Low Assertives in the Self-Efficacy Group vs. Correlation for High Assertives in Self-Efficacy Group	0.450	>.05
Correlation for Low Assertives in the Self-efficacy Group vs. Correlation for High Assertives in the Control Group	1.629	>.05
Correlation for Low Assertives in the Self-Efficacy Group vs. Correlation for Low Assertives in the Control Group	0.270	>.05
Correlation for High Assertives in the Self-Efficacy Group vs. Correlation for High Assertives in the Control Group	1.111	>.05
Correlation for Low Assertives in the Control Group vs. Correlation for High Assertives in the Self-Efficacy Group	0.021	>.05
Correlations for Low Assertives in the Control Group vs. Correlations for the High Assertives in the Control Group	1.209	>.05

Correlation coefficients were also computed between self-efficacy and task performance for the self-efficacy and control groups collapsed across assertiveness levels. The correlation between cyclical graph performance and self-efficacy scores for the self-efficacy group was nonsignificant, $r = -.01$, $p = .97$. However, the correlation between cyclical graph performance and self-efficacy scores for the control group was significant, $r = .34$, $p = .01$. It is evident from the z-test that the difference between these two correlations was nonsignificant, $z = -1.38$, $p > .05$.

The correlation between anagram performance and self-efficacy scores for the self-efficacy group collapsed across assertiveness levels was significant, $r = .45$, $p = .001$. However, the correlation between anagram performance and self-efficacy scores for the control group collapsed across assertiveness levels only approached significance, $r = .26$, $p = .06$. Again, the difference between these two correlations was nonsignificant, $z = .20$, $p > .05$.

Additional correlation coefficients were computed between self-efficacy and task performance for the low assertives and the high assertives collapsed across groups (self-efficacy and control). The correlation between cyclical graph performance and scores on the self-efficacy measure for the low assertive participants was nonsignificant, $r = .20$, $p = .17$. The correlation between cyclical graph performance and self-efficacy scores for the high assertive participants was also nonsignificant, $r = .07$, $p = .63$. Additionally, the difference between these two correlations was nonsignificant, $z = 0.10$, $p > .05$.

The correlation between anagram performance and scores on the self-efficacy measure for the low assertives collapsed across groups was significant, $r = .45$, $p < .001$. Similarly, the correlation between anagram performance and self-efficacy scores for the

high assertives collapsed across groups was also significant, $r = .31$, $p = .03$. However, according to the z-test, it is evident that the two correlations are not significantly different from one another, $z = 0.79$, $p > .05$.

Because none of the correlations were significantly different from each other, a statistical power analysis was conducted (Cohen, 1988). The power for each test of significance ranged from .01 to .46, with a mean power of .18. A power level of .80 is considered desirable.

Examination of Post-experimental Inquiry

Exploratory analysis of the Likert-like items on the post-experimental inquiry was conducted using a two by two ANOVA for each of the items. Again, there were two between-subjects factors: assertiveness (low vs. high) and group (self-efficacy group vs. control group). There was no significant interaction and no significant main effects between the variables for any of these analyses (see Table 14). Additionally, an overall post-experimental inquiry score was calculated by summing the scores of the individual six items. The interaction between assertiveness and group was nonsignificant, $F(1,105) = 1.63$, $p = .21$. The main effects of group $F(1, 105) = 1.05$, $p = .31$ and assertiveness $F(1,105) = .16$, $p = .70$ on the overall score were nonsignificant as well. These findings provide further evidence that the self-efficacy measure is not reactive (see Tables 15-17 for means and standard deviations for the individual items).

Table 14

Analysis of Variance for Post-Experimental Inquiry Items

Source	df	F	p
<u>Item 1: "I believe that the purpose of the procedure was to determine my level of confidence in performing the different tasks."</u>			
Assertiveness (A)	1, 105	.000	1.0
Group (G)	1, 105	.393	.53
A x G	1, 105	.000	1.0
<u>Item 2: "I believe that the purpose of the procedure was to remind me of the ways in which I should improve with practice."</u>			
Assertiveness (A)	1, 105	.133	.72
Group (G)	1, 105	.602	.44
A x G	1, 105	.293	.59
<u>Item 3: I believe that the purpose of the procedure was to get me to make a commitment regarding how much I would do on subsequent tasks.</u>			
Assertiveness (A)	1, 105	.044	.84
Group (G)	1, 105	.013	.91
A x G	1, 105	.554	.46
<u>Item 4: I attempted to match my actual level of performance on tasks with my previously-reported level of certainty regarding task completion.</u>			
Assertiveness (A)	1, 105	.606	.44
Group (G)	1, 105	.893	.35
A x G	1, 105	2.960	.09
<u>Item 5: "I tried to determine the purpose of the procedure that required me to rate my level of certainty."</u>			
Assertiveness (A)	1, 105	.385	.54
Group (G)	1, 105	.004	.95
A x G	1, 105	3.436	.07
<u>Item 6: I tried to please the experimenter by cooperating."</u>			
Assertiveness (A)	1, 105	3.858	.05
Group (G)	1, 105	.711	.40
A x G	1, 105	2.239	.14

Table 15

Means and Standard Deviations for Post-Experimental Inquiry Items Across Groups and Assertiveness Levels

	Group 1	Group 2	Group 3	Group 4
<u>Item 1: "I believe that the purpose of the procedure was to determine my level of confidence in performing the different tasks."</u>				
Mean	3.93	4.00	4.12	4.13
SD	1.23	1.06	1.01	.68
<u>Item 2: "I believe that the purpose of the procedure was to remind me of the ways in which I should improve with practice."</u>				
Mean	2.20	2.33	2.39	2.38
SD	.81	1.01	.95	.92
<u>Item 3: I believe that the purpose of the procedure was to get me to make a commitment regarding how much I would do on subsequent tasks.</u>				
Mean	2.70	2.88	2.81	2.71
SD	.99	1.08	.91	1.08
<u>Item 4: I attempted to match my actual level of performance on tasks with my previously-reported level of certainty regarding task completion.</u>				
Mean	3.57	3.38	3.39	3.88
SD	.97	1.21	.92	.74
<u>Item 5: "I tried to determine the purpose of the procedure that required me to rate my level of certainty."</u>				
Mean	3.80	3.33	3.42	3.67
SD	.85	1.01	.99	1.01
<u>Item 6: I tried to please the experimenter by cooperating."</u>				
Mean	4.27	3.63	4.10	4.04
SD	.91	1.13	.83	.81

Group 1: Low assertives in the self-efficacy group
 Group 2: High assertives in the self-efficacy group
 Group 3: Low assertives in the control group
 Group 4: High assertives in the control group

Table 16

Means and Standard Deviations for Post-Experimental Inquiry Items Across Groups

	Self-Efficacy Group	Control Group
<u>Question 1: "I believe that the purpose of the procedure was to determine my level of confidence in performing the different tasks."</u>		
Mean	4.00	4.13
SD	1.12	.92
<u>Question 2: "I believe that the purpose of the procedure was to remind me of the ways in which I should improve with practice."</u>		
Mean	2.25	2.39
SD	.89	.93
<u>Question 3: I believe that the purpose of the procedure was to get me to make a commitment regarding how much I would do on subsequent tasks.</u>		
Mean	2.77	2.77
SD	1.03	.97
<u>Question 4: I attempted to match my actual level of performance on tasks with my previously-reported level of certainty regarding task completion.</u>		
Mean	3.47	3.61
SD	1.08	.87
<u>Question 5: "I tried to determine the purpose of the procedure that required me to rate my level of certainty."</u>		
Mean	3.59	3.54
SD	.95	.99
<u>Question 6: I tried to please the experimenter by cooperating."</u>		
Mean	3.96	4.09
SD	1.06	.82

Table 17

Means and Standard Deviations for Post-Experimental Inquiry Items Across Assertiveness Levels

	<u>Low Assertive Participants</u>	<u>High Assertive Participants</u>
<u>Question 1: "I believe that the purpose of the procedure was to determine my level of confidence in performing the different tasks."</u>		
Mean	4.07	4.06
SD	1.12	.89
<u>Question 2: "I believe that the purpose of the procedure was to remind me of the ways in which I should improve with practice."</u>		
Mean	2.30	2.35
SD	.88	.96
<u>Question 3: I believe that the purpose of the procedure was to get me to make a commitment regarding how much I would do on subsequent tasks.</u>		
Mean	2.75	2.79
SD	.94	1.07
<u>Question 4: I attempted to match my actual level of performance on tasks with my previously-reported level of certainty regarding task completion.</u>		
Mean	3.48	3.63
SD	.94	1.02
<u>Question 5: "I tried to determine the purpose of the procedure that required me to rate my level of certainty."</u>		
Mean	3.61	3.50
SD	.94	1.01
<u>Question 6: I tried to please the experimenter by cooperating."</u>		
Mean	4.18	3.83
SD	.87	.97

CHAPTER IV

DISCUSSION

This section will include four main subsections. The first subsection will consist of a discussion of the findings of the study that pertain to whether repeated administration of the self-efficacy measure enhances or detracts from task performance, particularly for those individuals low in assertiveness. The second main subsection discusses the findings of the study regarding the question of whether repeated administration of the self-efficacy measure tends to lead to higher levels of reported self-efficacy, again with special focus on the low assertive individuals. The third main subsection provides a discussion of the results of the study with regard to the question of whether repeated administration of the self-efficacy measure leads to a correlation of greater magnitude between estimations of self-efficacy and performance. Once again, in this section there is a special focus on individuals who are low in assertiveness. The final section discusses findings pertaining to the question of whether a post-experimental inquiry identified any evidence that participants were able to perceive the purpose of the procedure of the study. In other words, did participants have an idea about why the scale was administered multiple times, and did they attempt to comply with their perceived purpose of the procedure? The objectives for each of these main subsections are as follows: to reiterate the specific research question, to summarize the findings pertaining to that question, to

relate these findings to past research, to identify any limitations of the study that pertain to the particular research question, and to make recommendations for future research addressing the research question or related hypotheses.

Repeated Administration of the Self-Efficacy Measure and Task Performance

The first main research question this study attempted to answer was whether repeated administration of the self-efficacy measure enhanced or detracted from task performance, especially for low assertive participants. The interaction between assertiveness (high vs. low) and group (self-efficacy vs. control) on task performance for both the cyclical graphs and anagrams was nonsignificant. Additionally, the main effects of both group and assertiveness on task performance were nonsignificant.

These results are consistent with Cervone's (1989) study of task persistence, which found no significant differences in performance between participants who recorded their self-efficacy estimations and those who did not. However, the results of the present study are inconsistent with Lee's (1984) study of assertiveness training, where self-efficacy measurements were found to enhance performance. One methodological limitation that exists in both the present study and Cervone's study is that, in contrast to the study by Lee as well as much of Bandura's past research, a treatment model was not utilized. In other words, the present study focused on task performance, rather than an improvement or change in participant behavior. Therefore, participants did not receive additional treatment-related cues that may have encouraged them to improve. For example, in Lee's study participants who were known to be non-assertive were seen by an experimenter for six sessions. In each session, the participants listened to a role-play session and were then asked to give an

assertive response. Each time, they were asked to be as assertive as possible and after completion of this task; the experimenter discussed the participant's response as well as any possible alternative responses. It seems likely that within this procedure the participants received cues that indicated they should improve at each session. It may have been the case that the existence of these cues contributed to Lee's finding that the self-efficacy measure was reactive in the sense that the assessment of self-efficacy lead to enhanced performance. Additionally, the performance tasks used in the present study relied on the aptitude of the participant, whereas in other studies (i.e. Lee, 1984) a change in behavior depended more on the motivation of the participant to improve.

Correspondingly, one recommendation for further examination of this research question is to conduct a study that employs a treatment or therapy model. For example, one could conduct a study similar to the present study in that it examines the reactivity of a self-efficacy measure by using a two by two analysis of variance with assertiveness (high vs. low) and group (self-efficacy vs. control) as the between subjects factors. It is suggested that any future study also include a high number of participants and a self-efficacy measure that has been utilized in the past, for replication purposes. The main divergence from the methodology of the present study would be the utilization of a treatment model, such as assertiveness training, that would include the treatment-related cues present in Lee's study and that would not rely so heavily on the aptitude of the participant.

Repeated Administration of the Self-Efficacy Measure and Levels of Reported Self-Efficacy

The second main research question posed was whether repeated administration of the self-efficacy scale was reactive in ways that influenced participants in the direction of reporting a higher subsequent level of self-efficacy. In particular, there was an interest in whether this evidence of reactivity would be more likely observed in participants with low assertiveness.

With regard to the cyclical graphs, the interaction between assertiveness and group on self-efficacy scores was nonsignificant at all three times (after completion of the first seven cyclical graphs, after completion of the first 10 cyclical graphs, and after completion of all the cyclical graphs). The main effect of group was also nonsignificant at all three times. However, there was a significant main effect of assertiveness on cyclical graph performance after completion of the first seven cyclical graphs and after the first 10 cyclical graphs, in that participants in the low assertiveness group tended to have lower scores than participants in the high assertiveness group. The main effect of assertiveness after completion of all the unsolvable graphs was nonsignificant.

With regard to the anagrams, the interaction between assertiveness and group on self-efficacy scores was nonsignificant at both times (after completion of the first 21 anagrams and after completion of all the anagrams). In addition, the main effect of group on self-efficacy scores was nonsignificant. The main effect of assertiveness was also nonsignificant.

These findings are consistent with the literature in that use of the self-efficacy measure did not increase future self-efficacy estimations (e.g., Altum and Reeb, 1999; Thomas, 1993), with the exception of a study by Arisohn, Bruch, & Heimberg (1988). Arisohn et al. does provide some evidence that some assessment methods can lead to enhanced self-efficacy ratings. The main purpose of this study was to evaluate whether alternate measurement methods contribute to differences in self-efficacy and outcome expectancy ratings in an assertiveness training paradigm. Participants included 34 university undergraduates who scored either high or low on a measure of assertiveness. Each participant was exposed to eight situations in which they were required to respond to an unreasonable request. In each situation, four of the request situations were presented by videotape while the other four were presented by printed stimulus materials. Additionally, in each situation the participant was asked to generate an assertive response by either choosing from an experimenter-produced list of effective refusal responses or by creating their own response. The study suggested that the method of self-efficacy assessment often used in self-efficacy research (i.e. printed scene and experimenter prepared response examples) produced higher self-efficacy ratings than those produced by other assessment methods. However, Bandura (1997) argues that the self-efficacy measure utilized in this study was confounded by instructional information. Specifically, the items of the self-efficacy measure included a set of assertive responses that the participants may not have known previously, which may have increased their levels of self-efficacy.

Correlation Between Self-Efficacy Estimations and Performance

The third main research question was preceded by the broad question of whether evidence of a relationship between self-efficacy estimations and performance existed in this study. To answer this general question, two correlational analyses were conducted, which yielded a significant correlation between self-efficacy scores and anagram performance, but no significant relationship between self-efficacy estimations and cyclical graph performance. The fact that the correlation between self-efficacy scores and cyclical graph performance was nonsignificant is somewhat troubling, because the finding that self-efficacy and performance is strongly correlated has been replicated many times. One speculation as to why a significant relationship between self-efficacy and cyclical graph performance was not found in this study has to do with a procedural limitation. The cyclical graphs that were used in the correlational analyses were the most difficult tasks that the participants had encountered at that point and there is evidence in the data that participants tended to overestimate their performance. That is, self-efficacy ratings for the cyclical graphs were typically higher than what participants actually achieved. Also, only three (out of 25) cyclical graphs were utilized to correlate self-efficacy estimations with performance. The small number of cyclical graphs used and the difficulty of these graphs may have affected the accuracy of participants' self-efficacy estimations and also resulted in a limited range of possible performance (0-3 graphs correct). Therefore, a suggestion for further examination of the correlation between self-efficacy and performance in this type of setting may include altering the difficulty of the task and increasing the number of possible tasks in the measure of performance.

Additionally, even though the correlation between self-efficacy estimations and anagram performance was significant, the correlation found in this study was much lower than what has been observed in previous studies by Bandura (1997). One speculation of why the correlation in the present study is lower in magnitude than those found in Bandura's studies might be related to methodological differences between this study and those conducted by Bandura. For example, as stated earlier, Bandura typically utilizes a treatment model in this line of research, while the present study did not. Another difference lies within the actual self-efficacy measures. In much of Bandura's research, the self-efficacy measures used were comprised of a list of very specific tasks, and participants are asked to designate the tasks they felt certain they could complete. In contrast, in the present study participants were asked to designate what percentage of the performance tasks they could successfully complete. These methodological differences may have contributed to the discrepancies in the magnitudes of the correlations.

The third main research question was whether repeated administration of the self-efficacy scale accompanied by repeated task performance would be reactive by leading to an increasingly higher correlation between self-efficacy estimations and performance, especially for individuals low in assertiveness. Results found that none of the correlations between self-efficacy scores and task performance were significantly different from each other, providing evidence for Bandura's argument that the self-efficacy measure is not reactive. These results are consistent with Altum and Reeb's (1999) study that found no significant group differences in the magnitude of the correlation between self-efficacy estimations and performance. Further, these

findings enhance the results of past studies that found evidence that social pressure either reduces (Telch et al., 1982) or has no effect (Gauthier & Ladouceur, 1981) on the correlation between self-efficacy beliefs and behavior.

Post-experimental Inquiry Analysis

The fourth research question was whether participants were able to perceive the purpose of the specific procedure of the study (repeated self-efficacy assessment) and whether they attempted to comply with this perceived purpose. There was no significant interaction between assertiveness (high vs. low) or group (self-efficacy vs. control) on any of the post-experimental inquiry scores. Additionally, the main effects of both group and assertiveness on the post-experimental inquiry scores were nonsignificant for five out of the six items. However, as would be expected, the main effect of assertiveness was statistically significant for item six ("I tried to please the experimenter by cooperating"). Specifically, individuals low in assertiveness tended to endorse this item more often than individuals high in assertiveness. Overall, these results provide further evidence that the self-efficacy measure is not reactive and are again consistent with Altum and Reeb's (1999) study examining the reactivity of self-efficacy measures, which utilized an almost identical set of items as part of a post-experimental inquiry.

The findings of the present study that the assessment of self-efficacy is not reactive, even in low assertive individuals, supports Bandura's position regarding his self-efficacy theory. This is an important finding, considering that critics of self-efficacy theory speculate that the relationship between self-efficacy estimations and behavior is due to the reactivity of the self-efficacy measure, rather than to an actual

belief-behavior correspondence. If the measure were found to be highly reactive, some findings from over twenty years of research linking self-efficacy and outcome behavior would be thrown into question.

Summary and Conclusions

This thesis explored the problem of reactivity in the assessment of Albert Bandura's self-efficacy construct. Specifically, this study addressed research questions pertaining to whether self-efficacy measures were reactive, especially for individuals low in assertiveness. University undergraduates who scored either high or low on a measure of assertiveness were assigned to one of two groups, a control group, or an experimental (self-efficacy) group. Both groups were asked to complete a series of performance tasks. Additionally, the experimental group reported their self-efficacy estimations a total of 14 times throughout the procedure. In contrast, the self-efficacy estimations of the control group were measured only five times. Results support Bandura's position that the self-efficacy measure is not reactive. However, continued research of this topic is suggested to further investigate the specific research questions pertaining to reactivity in the assessment of self-efficacy for low assertive individuals. For example, a study that examines the reactivity of self-efficacy assessments for low assertive participants versus high assertive participants while utilizing a treatment model wherein treatment-related cues may be present is recommended to address some of these questions.

APPENDIX A

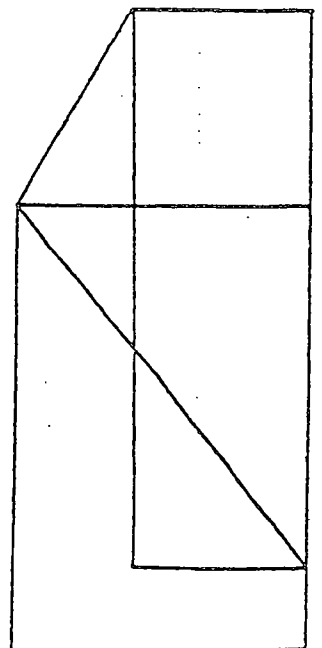
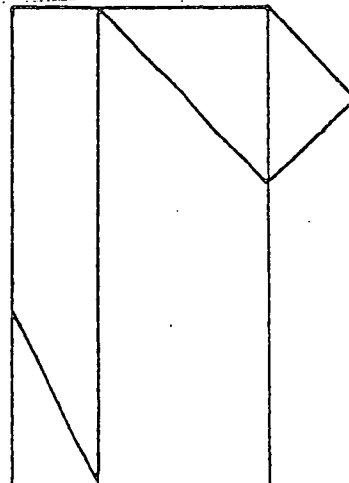
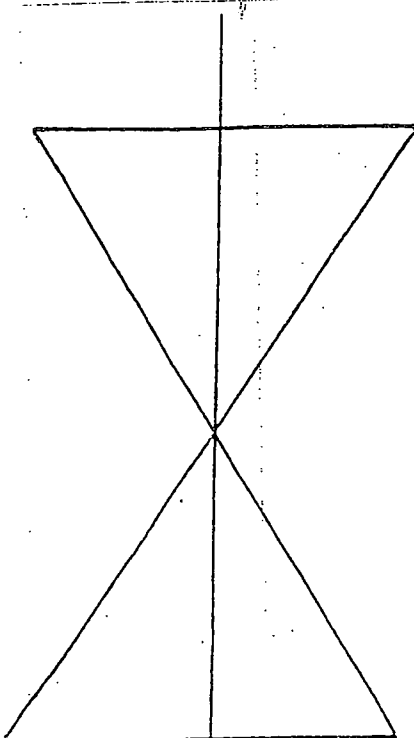
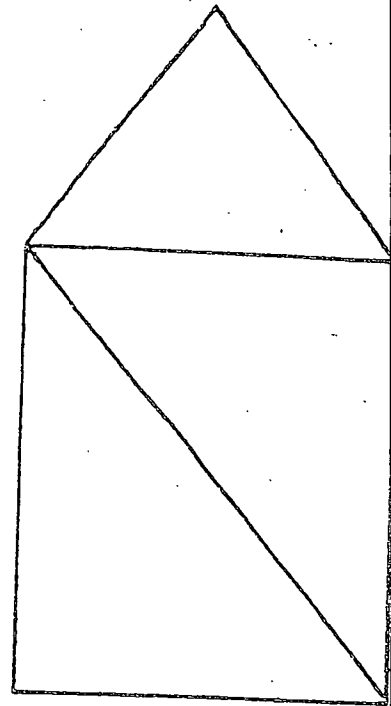
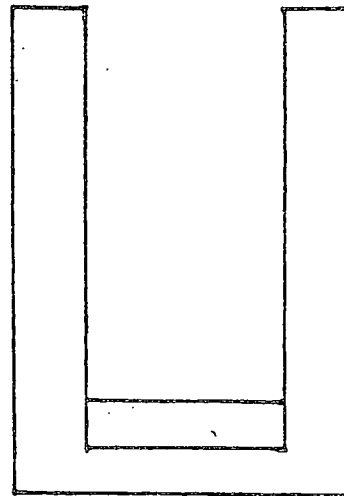
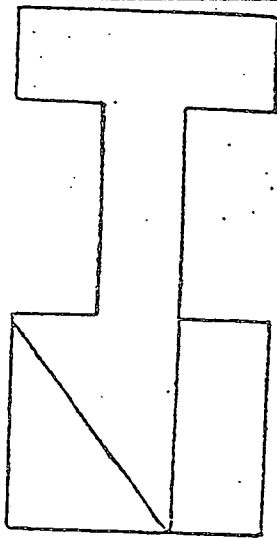
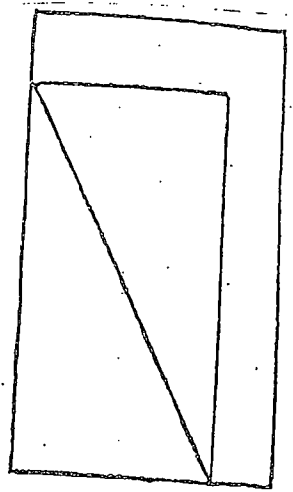
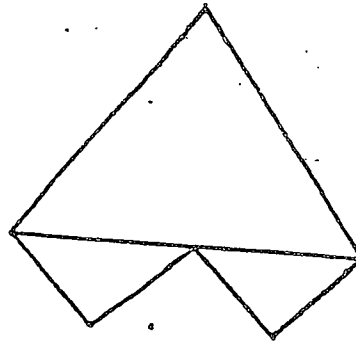
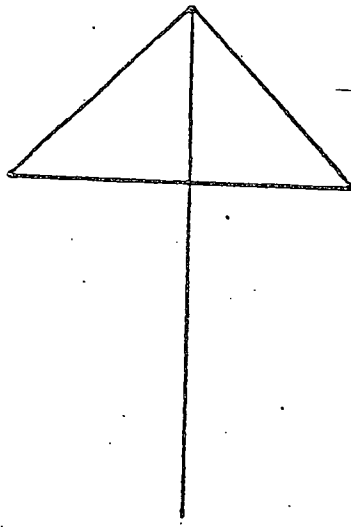
The College Self-Expression Scale

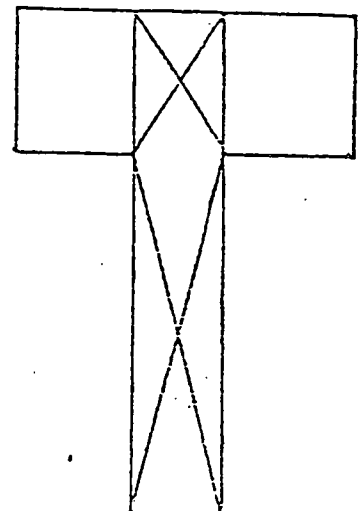
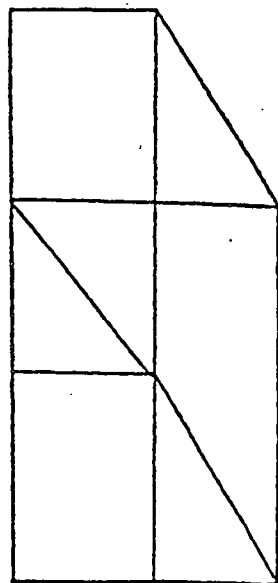
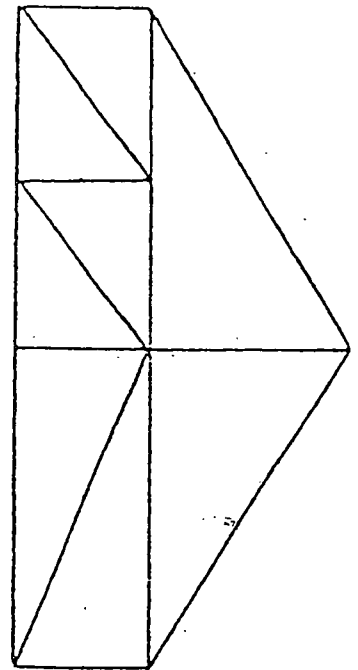
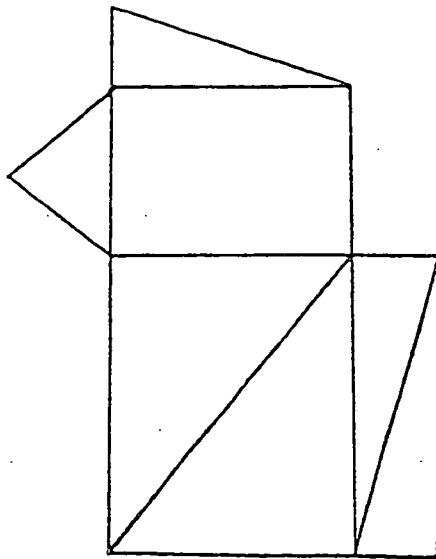
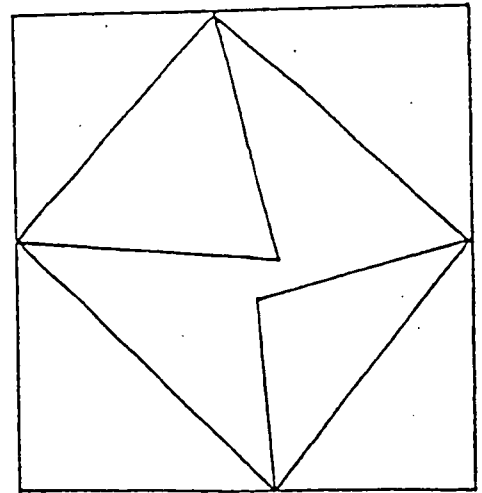
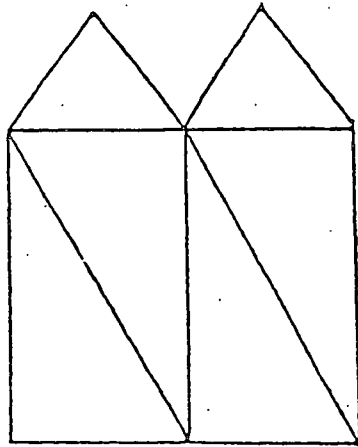
The following inventory is designed to provide information about the way in which you express yourself. Please answer the questions by filing in the appropriate circle from 1-5 (Almost Always or Always = 1; Usually = 2; Sometimes = 3; Seldom = 4; Never or Rarely = 5) on the answer sheet. Your answer should reflect how you generally express yourself in the situation.

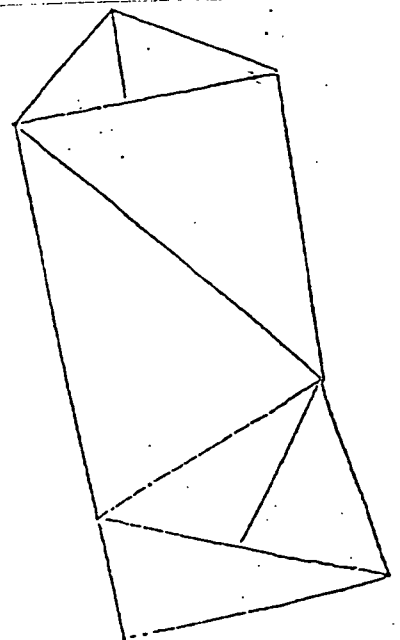
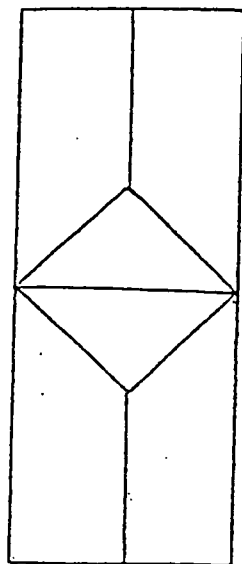
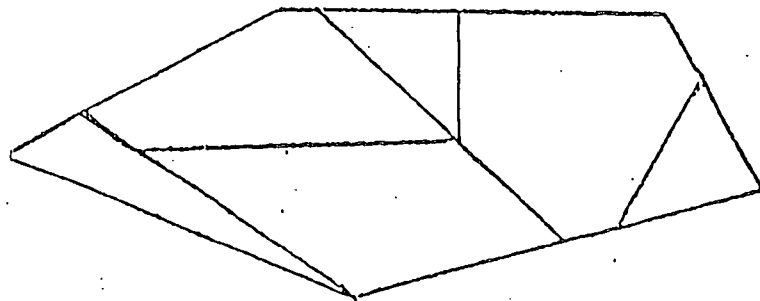
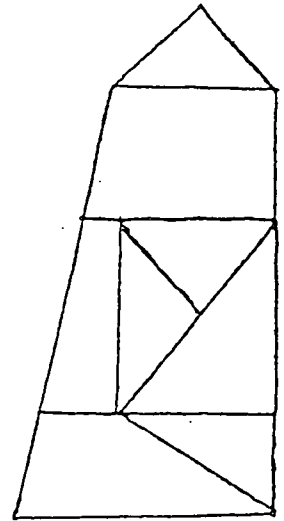
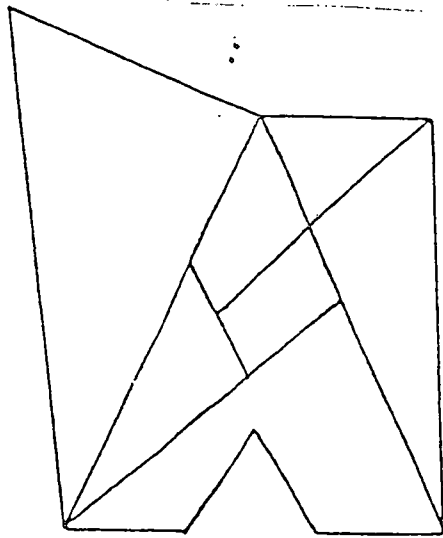
	0	1	2	3	4
	Almost Always				Never or Rarely
1.	Do you ignore it when someone pushes in front of you in line?				
2.	When you decide that you no longer want to date someone, do you have marked difficulty telling the person of your decision?				
3.	Would you exchange a purchase you discover to be faulty?				
4.	If you decided to change your major to a field which your parents will not approve, would you have difficulty telling them?				
5.	Are you inclined to be overly apologetic?				
6.	If you were studying and if your roommate were making too much noise, would you ask him/her to stop?				
7.	Is it difficult for you to compliment and praise others?				
8.	If you are angry at your parents, can you tell them?				
9.	Do you insist that your roommate does his/her fair share of the cleaning?				
10.	If you find yourself becoming fond of someone you are dating, would you have difficulty expressing these feelings to that person?				
11.	If a friend who has borrowed \$10.00 from you seems to have forgotten about it, would you remind this person?				
12.	Are you overly careful to avoid hurting other people's feelings?				
13.	If you have a close friend whom your parents dislike and constantly criticize, would you inform your parents that you disagree with them and tell them of your friend's assets?				
14.	Do you find it difficult to ask a friend to do a favor for you?				
15.	If food which is not to your satisfaction is served in a restaurant, would you complain about it to the waiter?				
16.	If your roommate without your permission eats food that he/she knows you have been saving, can you express your displeasure to him/her?				
17.	If a salesman has gone to considerable trouble to show you some merchandise which is not quite suitable, do you have difficulty in saying no?				
18.	Do you keep your opinions to yourself?				
19.	If your friends visit when you want to study, do you ask them to return at a more convenient time?				
20.	Are you able to express love and affection to people for whom you care?				
21.	If you were in a small seminar and the professor made a statement that you considered untrue, would you question it?				
22.	If a person of the opposite sex whom you have been waiting to meet smiles or directs attention to you at a party, would you take initiative in initiating a conversation?				

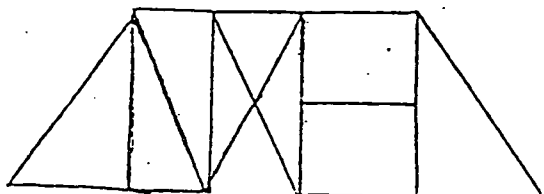
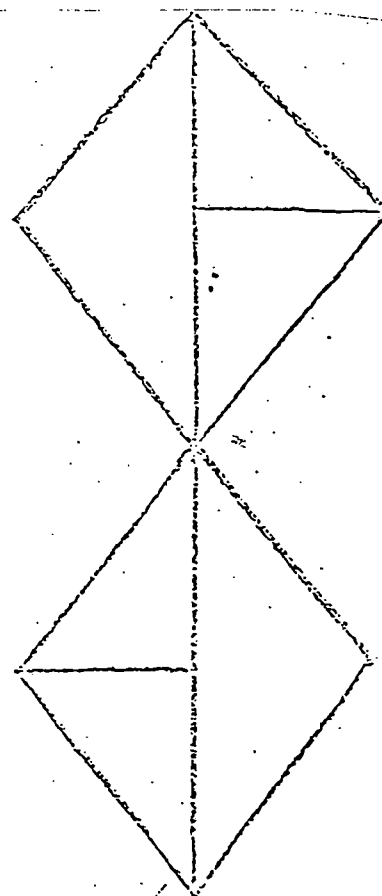
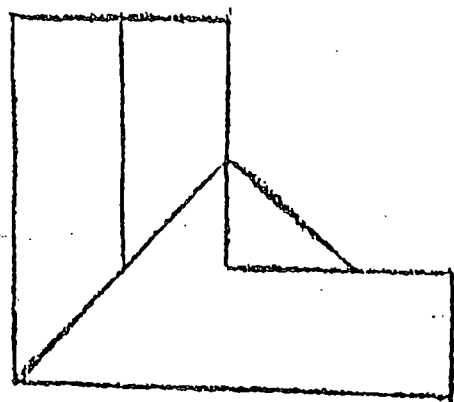
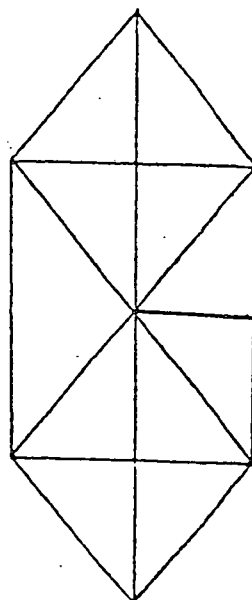
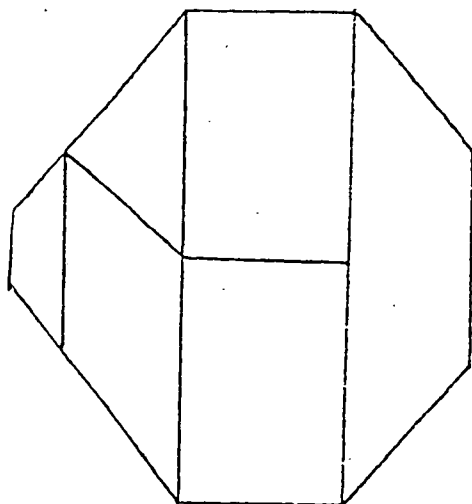
23. If someone you respect expresses opinions with which you strongly disagree, would you venture to state your own point of view?
24. Do you go out of your way to avoid trouble with other people?
25. If a friend is wearing a new outfit which you like, do you tell that person so?
26. If after leaving a store you realize that you have been "short-changed," do you go back and request the right amount?
27. If a friend makes what you consider to be an unreasonable request, are you able to refuse?
28. If a close and respected relative were annoying you, would you hide your feelings rather than express your annoyance?
29. If your parents want you to come home for a weekend but you have made important plans, would you tell them of your preference?
30. Do you express anger or annoyance to people of the opposite sex when it is justified?
31. If a friend does an errand for you, do you tell that person how much you appreciate it?
32. When a person is blatantly unfair, do you fail to say something about it to him?
33. Do you avoid social contacts for fear of saying the wrong thing?
34. If a friend betrays your confidence, would you hesitate to express annoyance to that person?
35. When a clerk in a store waits on someone who has come in after you, do you call his attention to that matter?
36. If you are particularly happy about someone's good fortune, can you express this to that person?
37. Would you be hesitant about asking a good friend to lend you a few dollars?
38. If a person teases you to the point that it is no longer fun, do you have difficulty expressing your displeasure?
39. If you arrive late for a meeting, would you rather stand than go to the front seat which could only be secured with a fair degree of conspicuousness?
40. If your date calls on Saturday night 15 minutes before you are supposed to meet and says that she/he has to study for an important exam and cannot make it, would you express your annoyance?
41. If someone keeps kicking your chair in a movie, would you ask him to stop?
42. If someone interrupts you in the middle of an important conversation, do you request that the person wait until you have finished?
43. Do you freely volunteer information or opinions in class discussions?
44. Are you reluctant to speak to an attractive acquaintance of the opposite sex?
45. If you lived in an apartment and the landlord failed to make certain repairs after promising to do so, would you insist on it?
46. If your parents want you home by a certain time which you feel is much too early an unreasonable, do you attempt to discuss or negotiate this with them?
47. Do you find it difficult to stand up for your rights?
48. If a friend unjustifiably criticizes you, do you express your resentment there and then?
49. Do you express your feelings to others?
50. Do you avoid asking questions in class for fear of feeling self-conscious?

APPENDIX B
Cyclical Graphs









APPENDIX C

Anagrams

	<u>Scrambled Word</u>	<u>Solution</u>
Ex.	LFUET	FLUTE
1.	ECOMT	COMET
2.	NEPYN	PENNY
3.	LVATU	VAULT
4.	TSIHR	SHIRT
5.	RCIPE	PRICE
6.	HLITG	LIGHT
7.	RITNA	TRAIN
8.	LPEPA	APPLE
9.	CEHAB	BEACH
10.	EIRRV	RIVER
11.	KRECE	CREEK
12.	GITFH	FIGHT
13.	MTROS	STORM
14.	TIVSEN	INVEST
15.	RIERDV	DRIVER
16.	CINICL	CLINIC
17.	BUYSAW	SUBWAY
18.	AUGIRT	GUITAR
19.	POCUNO	COUPON
20.	HCDOIR	ORCHID
21.	NNNOCA	CANNON

22.	GENIEN	ENGINE
23.	RHTOTA	THROAT
24.	EHECSE	CHEESE
25.	ESSANO	SEASON

APPENDIX D

Self-Efficacy Assessment

Using the rating scale at the bottom of the page, please rate how confident you are that you can do the following in the future:

- | | <u>Rating</u> |
|-----------------------------------|---------------|
| 1. Complete 0-10% of the tasks | _____ |
| 2. Complete 11-20% of the tasks | _____ |
| 3. Complete 21-30% of the tasks | _____ |
| 4. Complete 31-40% of the tasks | _____ |
| 5. Complete 41-50% of the tasks | _____ |
| 6. Complete 51-60% of the tasks | _____ |
| 7. Complete 61-70% of the tasks | _____ |
| 8. Complete 71-80% of the tasks | _____ |
| 9. Complete 81-90% of the tasks | _____ |
| 10. Complete 91-100% of the tasks | _____ |

RATING SCALE

Rate your degree of confidence by recording a number from 10 to 100 using the scale given below:

10	20	30	40	50	60	70	80	90	100
Certain that I can not do it				Moderately certain that I can do it				Certain that I can do it	

APPENDIX E

Post-experimental Inquiry

Please answer the following questions:

(1) During the experiment you were asked to rate how certain you were that you could do each of the tasks. What do you think was the purpose of this procedure?

Please rate your level of agreement / disagreement with the following questions in terms of the scale provided. These questions are also related to the procedure that instructed you to rate how certain you were that you could do the different tasks.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
(1) I believe that the purpose of the procedure was to determine my level of confidence in performing the different tasks.				

(2) I believe that the purpose of the procedure was to remind me of the ways in which I should improve with practice.				

(3) I believe that the purpose of the procedure was to get me to make a commitment regarding how much I would do on subsequent tasks.				

(4) I attempted to match my actual level of performance on tasks with my previously-reported level of certainty regarding task completion.				

(5) I tried to determine the purpose of the procedure that required me to rate my level of certainty.				

(6) I tried to please the experimenter by cooperating.				

APPENDIX F

Anagram Instruction Script

To be read to the participants by the experimenter prior to starting the anagrams:

“You are now going to attempt to solve a number of tasks called anagrams. These anagrams are five or six letters that can be rearranged to form a common English word. You will have 15 seconds to complete each anagram. After 15 seconds have elapsed, I will call “Time” and you are to stop working. I will tell you when you are to begin the next anagram.”

APPENDIX G

Cyclical Graphs Instruction Script

To be read to the participants by the experimenter prior to starting the cyclical graphs:

“You are now going to attempt to solve a number of tasks called cyclical graphs. The purpose of this task is to completely trace the geometric figure without raising your pencil from the page and without tracing any line more than once. You will have 15 seconds to complete each cyclical graph. After 15 seconds have elapsed, I will call “Time” and you are to stop working. I will tell you when you are to begin the next graph.”

APPENDIX H
Informed Consent

Informed Consent

Project Title:	Judgment and Performance
Investigators:	Sara Dittoe and Roger N. Reeb, Ph.D. (faculty sponsor)
Description of Study:	Participants will complete a series of puzzle-like tasks and complete several questionnaires.
Adverse Effects and Risks:	No adverse effects are anticipated.
Duration of the Study:	This study will take approximately one hour to complete.
Confidentiality of Data:	Your name will be kept separate from the data. Both your name and the data will be kept in a locked desk drawer. Your name will not be revealed in any document resulting from the study.
Contact	Students may contact Roger N. Reeb in SJ 306 (937) 229-2395, email: roger.reeb@notes.udayton.edu or Sara Dittoe (937) 229-2175, email: saradittoe@hotmail.com if they have any questions or problems after the study. Students may also contact the chair of the Research Review and Ethics Committee, Charles E. Kimble, Ph.D. in SJ 319, (937) 229-2167, email: charles.kimble@notes.udayton.edu.
Consent to Participate:	I have voluntarily decided to participate in this study. The investigator named above has adequately answered any and all questions I have about this study, the procedures involved, and my participation. I understand that the investigator named above will be available to answer my questions about research procedure throughout this study. I also understand that I may voluntarily terminate my participation in this study at any time and still receive full credit. I also understand that the investigator named above may terminate my participation in this study if s/he feels it is in my best interest. In addition, I certify that I am 18 (eighteen) years of age or older.

Signature of Student	Student's Name (printed)	Date
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Signature of Witness _____ Date _____

Research PSY 101 Section _____ Instructor _____ 1 Credit

Information: Student ID# or Social Security Number

Credit for term _____

APPENDIX I

Debriefing

Debriefing

Information about the Study

The purpose of this study is to test whether measures of self-efficacy are more reactive in non-assertive versus assertive individuals. In 1977, Albert Bandura first introduced the concept of self-efficacy. A simple definition of this construct is one's perceived ability to accomplish a goal.

In clinical research, it is possible for certain characteristics of an assessment measure to influence a participant's behavior. An assessment measure is considered *reactive* if being aware of assessment leads people to respond in a different way from how they would typically respond. Some critics of the self-efficacy construct argue that measures of self-efficacy may have reactive effects. Several studies have been done to address this issue and have found no reactive effects in the assessment of self-efficacy. However, one study that has found assessment of self-efficacy to be reactive involved measuring self-efficacy in the context of an assertiveness training intervention. Due to this finding, the present study tests the hypothesis that measures of self-efficacy are reactive in nonassertive individuals, because they may tend to misconstrue self-efficacy assessment as social pressure and then comply accordingly.

To test our hypothesis we first measured your assertiveness using a questionnaire during mass testing. We then had you complete several performance tasks (the cyclical graphs). Depending on which condition you were assigned to, you were then asked to complete one to four questionnaires assessing your self-efficacy regarding these tasks. We will do statistical tests on all participants' responses to see if there is a relationship between assertiveness and reactivity of measures of self-efficacy.

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Assurance of Privacy

We are seeking general principles of behavior and are not evaluating you personally in any way. Your responses will be kept confidential and your responses will only be identified by a participant number in the data set along with other participants' numbers.

Contact Information

Students may contact Roger N. Reeb in SJ 306, (937) 229-2395 if they have any questions or problems after the study. Students may also contact the chair of the Research Review and Ethics Committee, Charles E. Kimble, Ph.D. in SJ 319, (937) 229-2167.

Thank you for your participation. I will turn in your research credit form so you will receive credit.

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