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Subgroup DIFFERENCES IN COGNITIVE Ability
TEST PERFORMANCE: THE INCREMENTAL
CONTRIBUTIONS OF SELF-EFFICACY

presented by

DANIELLE A. JENNINGS

has been accepted towards fulfillment
of the requirements for

M.A. degree in Psychology


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**SUBGROUP DIFFERENCES IN COGNITIVE ABILITY TEST PERFORMANCE: THE
INCREMENTAL CONTRIBUTIONS OF SELF-EFFICACY**

By

Danielle A. Jennings

A MASTER'S THESIS

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

MASTER OF ARTS

Department of Psychology

1998

ABSTRACT

SUBGROUP DIFFERENCES IN COGNITIVE ABILITY TEST PERFORMANCE: THE INCREMENTAL CONTRIBUTIONS OF SELF-EFFICACY

By

Danielle A. Jennings

The purpose of this study was to investigate whether self-efficacy for cognitive ability test performance was related to subgroup status. One's race, individual-collective orientation and beliefs about his or her group were investigated to determine potential influences on one's level of self-efficacy. This study also attempted to discover whether the relationship between self-efficacy and performance was moderated by race. Overall, this study assessed an individual's performance on cognitive ability tests, and attempted to determine the role that self-efficacy and race play in determining cognitive ability test scores. Moderated regression analyses were performed to determine the results of the hypotheses generated. Results suggested that self-efficacy did not directly account for difference in cognitive ability test performance between African Americans and Euro-Americans. Contrary to predictions, African Americans possessed a higher sense of self-efficacy for cognitive ability tests than Euro-Americans, but were outperformed by their Euro-American counterparts.

ACKNOWLEDGMENTS

First giving honor to God, I know that without Him none of this would have been possible. "Bless the Lord, O my soul: and all that is within me, bless his name." Psalm 103:1.

Next, I would like to thank my chair, Neal Schmitt, PhD. He is an amazing advisor who is willing to kick you in the pants or hold your hand whichever is necessary at the time. Without his guidance and direction I know that this thesis would not have been accomplished.

Additionally, thank you to the remaining members of my committee, Dan Ilgen, PhD and Rick DeShon, PhD. Your support was instrumental in the formulation of thoughts and the resolution of problems. Thank you for challenging me and the way in which I thought about the research covered in this thesis.

I would also like to thank my cohort--the incoming class of 1995. Thank you for being there when I needed a shoulder to cry on or an ear to listen. Your support and love are irreplaceable.

To Christine Streets, Brenda Mitchner and Patricia Green, words cannot express the depth of my gratitude for all of your love and support throughout this thesis. I thank God every day for blessing me with incredible friends like you. You will always have a special place in my heart. I love you!

To my family who has been there for me for the last 25 years of my life, I want to say “thank you.” Your prayers and commitment and your undying and unwavering love have helped me through this storm. Thank you for pushing and for holding me up when I thought I could no longer stand.

Last, but definitely not least, to my love, Marshaun, “thank you.” You have been there for me since the beginning and have seen this thesis through to the end. I want to thank you for your support and undying love. When I did not think that I could finish or face another day, you were there with a smile and a hug!! Thank you for your loving arms and for being such an important part of my life!! I LOVE YOU!!

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INTRODUCTION

Today's employers have many pre-employment testing measures to assess the potential of job applicants. The type of measures utilized range from cognitive ability tests to assessment centers to structured interviews. Although these measures are used to select the most qualified applicants for the position, some of the most popular and valid measures utilized elicit a disparity in performance scores between subgroups, such as African Americans and Euro-Americans. For example, the cognitive ability measure administered in a paper-and-pencil fashion has been shown to be one of the most valid of selection measures and one of the most predictive; however, it also reflects the greatest degree of subgroup difference in performance scores with Euro-Americans scoring higher than African Americans. This disparity in performance scores between racial groups is reflected in the disproportionate number of African Americans relative to Euro-Americans selected for employment. This disparity in hiring ratios has been called adverse impact.

Adverse impact has resulted in legal action, such as charges of discrimination and reverse discrimination, pursued by those negatively affected by the selection process, testing in particular. The courts and various guidelines have also indicated that adverse impact creates a burden for the employer to show that the selection test is job-related and not biased. In addition, Executive Order 11246 (1967) required federal contractors to

ensure that individuals were employed and "treated while employed, without regard to their race, color, religion, sex or national origin" (Turner, Pratkanis, & Hardaway, 1991, p.798). Affirmative Action plans, which set goals and define procedures designed to increase opportunities for minority groups, have become commonplace in the employment arena. As a result, companies have attempted to increase the representation of minority groups, such as, African Americans and women, in their applicant pool. This attempt, however, is hampered by the selection or testing process in which subgroup differences in performance on the selection tests imply lower ability of one group in comparison to another group. Consequently, the hiring ratio often is greater for the Euro-American majority than for minorities.

Title VII of the Civil Rights Act of 1964 prohibited discrimination in employment due to an applicant's or employee's race, religion, sex, or national origin. However, if a selection measure was not intentionally developed for a discriminatory purpose, and if the employer could show that the test was needed, it could be used regardless of the potential exclusionary impact on minorities and women (Seymour, 1988). As a result of the Civil Rights Acts and other legal cases challenging the selection process utilized by employers, employers began "to play the numbers game." They were made aware of the fact that as long as the hiring ratio was acceptable, the company would not be a target for legal action. In the case of legal action, the courts would first focus on the number of applicants hired from each respective group, and if a disparity existed, then the hiring process would be further investigated. However, if a disparity did not exist, then no further investigation was warranted.

In the first Supreme Court case concerned with discrimination in the workplace-- Griggs v. Duke Power Company, the Supreme Court ruled that employers were not only required to state that selection measures were job-related, but that they had to prove them to be (Seymour, 1988). According to Bersoff (1981), the case of Griggs v Duke Power Company "introduced the concept of 'job-relatedness' into the law of employment testing" (p.1050). Consequently, employers have been required to prove the job-relatedness of selection tests. Job-related tests as defined by the Equal Employment Opportunity Commission (EEOC, 1966) Guidelines on Employment Testing are measures that fairly assess the requisite knowledge or skills required to perform a job (Bersoff, 1981

For decades, it has been believed that African Americans are inferior to Euro-Americans in cognitive ability. In 1942, about 60% of Euro-Americans believed this to be true, and in 1964, that number dropped to about 25% (Bobo, 1988). Still to date, society continuously reminds African Americans that they are inferior in cognitive ability to Euro-Americans. Repetitively, research has shown that Euro-Americans and African Americans differ in regards to paper-and-pencil cognitive ability test scores by approximately one standard deviation (Jensen, 1980). Summaries of such findings are included in The Bell Curve by R. J. Herrnstein and C. Murray and are commonly reported on standardized cognitive ability tests such as the Scholastic Aptitude Test, the American College Test or the Graduate Record Examination (Jensen, 1984).

The consistent stereotype of inferiority reinforced by these reports may impact the way an African American views himself/herself. When developing one's identity, an African American must engage in a dual task. The African American attempts to assemble a positive self image while disavowing the negative stereotypes attributed to

African Americans (Oyserman, Gant, & Ager, 1995). My belief is that this negative stereotype often becomes part of the African American self-identity and that it serves to identify African Americans in such a way that their test performance is affected.

Another way that society may negatively influence the sense of self-efficacy held by African Americans is the unintended effect of the implementation of Affirmative Action and preferential selection programs that elicit the belief that recipients are inferior. With the introduction of Affirmative Action programs and preferential selection, beneficiaries of such programs may hold beliefs that they do not possess the requirements necessary for the position--discounting their knowledge, skills, and abilities (Turner, et al, 1991). Likewise, the targeted populations are viewed by others as incompetent and observers believe that inferior applicants have been selected (Blaine, Crocker, & Major, 1995). The recipients and fellow employees are aware that characteristics other than those relevant to the job (e.g., gender, race, or age) played an important role in the selection of the applicant (Pettigrew & Martin, 1987). All of this information may impact an individual's belief about his or her ability to perform. Consequently, if the group in which he or she is a member is consistently regarded as inferior and tests reflect such, an applicant may begin to internalize this information which, in turn, may impact his or her sense of self-efficacy. In addition, if programs are implemented that further suggest inferiority, then the applicant may not believe that he/she has what it takes to successfully complete a given task or perform well on the job.

Whatever the origin, this thesis investigates the proposition that differences in self-efficacy between subgroups (e.g., African Americans and Euro-Americans) account for some of the variance in scores between subgroups on cognitive ability tests. In

Graham's (1994) opinion, many African American students do not perform well in school and do not pursue future goals, "not because they lack basic intellectual competencies or specific learning skills, but because they have low expectations, feel hopeless, deny the importance of individual effort, or give up in the face of failure" (p.55). As a result, an African American's sense of competence is diminished due to the belief that, for him or her, success is unlikely. (Oyserman, et al., 1995). Findings from a study conducted by Eden and Kinnar (1991) provided evidence that those who lacked a belief in their ability to perform well were less likely to even attempt the necessary behavior and thus, fulfill a prophecy of incompetence and lack of ability. According to Bandura (1982), people give up when attempting to accomplish something or simply do not attempt to accomplish a given task because they believe that their efforts will go unnoticed or unrecognized. Therefore, an African American's lack of belief about his or her ability to perform could explain some of the difference in performance scores on cognitive ability tests between African Americans and Euro-Americans.

If self-efficacy is found to be significant in regards to the amount of adverse impact displayed in selection measures, this finding opens the door of opportunity to increase the self-efficacy of those that are lacking, in hopes of enhancing minority group performance on such tests. Self-efficacy is fluid and amenable (Gist & Mitchell, 1992); whereas, an individual's general mental ability is rather static and less likely to be increased. With this understanding, an individual may increase his or her performance score on a selection measure, cognitive ability test in particular, by increasing his or her belief that he or she possesses what is necessary to successfully execute the task before him or her. According to the Galatea effect, increasing one's expectations about his or her

performance, results in an increase in performance (Eden & Kinnar, 1991). The Galatea effect is a type of self-fulfilling prophecy. If an individual's belief about his or her ability to perform is enhanced resulting in increased expectations of success, then better performances should be observed.

The purpose of this study is to investigate another potential explanation to adverse impact in selection testing besides that of subgroup differences in cognitive ability. In particular, this study will attempt to determine whether self-efficacy is related to subgroup status and to identify and validate the relationship between self-efficacy and performance on cognitive ability tests. In addition, it will attempt to discover whether the relationship between self-efficacy and performance is moderated by race. This study will also assess an individual's performance on cognitive ability tests, and attempt to determine the role that self-efficacy and race may play in determining test scores.

First, we will examine previous research investigating subgroup differences in performance on cognitive ability tests. Next, we will focus on self-efficacy, which is proposed as one of the primary reasons for differences in cognitive ability test scores between African Americans and Euro-Americans. Following, if the predicted difference between African Americans is found, we will suggest potential reasons for the disparity in self-efficacy between African Americans and Euro-Americans (e.g., collectivism-individualism and awareness of disparity in performance scores). Then, we will review literature addressing the relationship between self-efficacy and performance and what factors may influence such a relationship. Hypotheses will be stated at the end of these sections and an overall model of the hypothesized relationships will be presented at the conclusion of the literature review (See Figure 4).

Chapter 1

SUBGROUP DIFFERENCES IN COGNITIVE ABILITY TESTING

As previously stated, research has repeatedly found a one-standard deviation difference between African Americans and Euro-Americans on cognitive ability tests, with that of Euro-Americans being higher (Hunter & Hunter, 1984; Schmidt, Greenthal, Hunter, Berner, & Seaton, 1977). Several theories, which encompass the nature vs nurture controversy, have suggested reasons for the difference in cognitive ability: the genetic or heredity theory, the environmentalist theory, the culturalist perspective (a specific focus of the environmentalist theory), and the interactionist theory (genetic x environment). Those favoring the heredity theory (internal) focus on the cognitive ability test score as a true measure of one's intellectual capacity, regardless of demographic issues, such as quality of education or socioeconomic status. Starting with Jensen's (1969) monograph, mean cores on intelligence tests were found to differ between African American and Euro-American groups (Loehlin, Lindzey, & Spuhler, 1975). According to Loehlin, et al (1975), research has specifically found that differences in intelligence scores within the Euro-American population can be attributed to genetic differences. In a table constructed by Loehlin, et al (1975) based on studies conducted between 1911

1962, figures suggest that seventy-five percent (range of 60 to 80%) of the variance in intelligence test scores can be attributed to genetic factors.

Researchers advocating the attribution of subgroup differences in cognitive ability to genetic factors do recognize the potential influence of environmental factors, such as Jensen (1969b) who suggested that the environment was a "threshold variable" (Bernal, 1984). The environment may limit the potential to which one may aspire. According to Loehlin, et al (1975), performance on an intelligence test can be a function of many factors, not just cognitive ability. The environmental perspective explains African American-Euro-American differences by highlighting external factors, such as oppression or deprivation. Further, in regards to racial differences in cognitive ability, Jensen (1969) acknowledges that the environment, or its interaction with genetic factors, may influence the differences found in test scores between African Americans and Euro-Americans (Loehlin, et al, 1975). When examining studies conducted between 1911 and 1962, Loehlin, et al (1975) found that twenty-five percent of the variance in intelligence test scores could be attributed to environmental factors. Additionally, Grubb and Ollendick (1986) reported research that has shown gender, socioeconomic status, father's occupation and one's residence decreases the difference in intelligence test scores between African Americans and Euro-Americans to about one-half standard deviation. In particular, McGurk (1978) found that an improvement in the socioeconomic status of African Americans did significantly increase the intelligence scores of African Americans (Eysenck, 1984). Likewise, Crane (1994) cites Humphreys (1985) who states that racial differences in intelligence tests were substantially accounted for by socioeconomic status.

Research has also looked at what else is being tapped by cognitive ability

measures; for example, motivation and knowledge of the majority culture. The culturalist perspective has argued that items developed and the manner in which an intelligence test is administered reflect a bias in favor of the dominant culture (Euro-Americans), resulting in subgroup differences in performance (Helms, 1992). Perhaps a definition of intelligence that could be embraced by the advocates of this perspective is that proposed by Humphreys (1971): "the entire repertoire of *acquired* skills, knowledge, learning sets and generalization tendencies considered intellectual in nature that are available at any one period of time" (Grubb & Ollendick, 1986, p.399). Acquired information may be different for majority and minority cultures. Members of the Euro-American culture gather information about the Euro-American culture; whereas, members of the African American community must gain knowledge of not only their own culture, but also that of the Euro-American community. Consequently, differences between groups in intelligence test scores may be observed when the content of the intelligence test reflects only that of the Euro-American culture. As suggested by the culturalist perspective, adverse impact is inherent in intelligence tests which suggests a defect in the test construction and administration (Wollack, 1994).

According to Loehlin, et al. (1975), any psychology test of cognitive ability can not be "culture-free" or "culture-fair" when administered to other cultures because development of the measure will reflect the cultural biases of the developer and the environment. Furthermore, in an attempt to demonstrate cultural bias in cognitive ability tests, Williams (1972) developed the Black Intelligence Test of Cultural Heterogeneity (BITCH Test; Harrington, 1984). This intelligence test was purposely biased in favor of African Americans since the vocabulary test was based on words and phrases distinctive

of the African American culture. Consequently, African Americans, on the average, scored higher than Euro-Americans on this culturally-biased test. However, the issue of cultural bias in intelligence tests, in which the content of the tests is thought to reflect information inherent primarily in the majority population, has been challenged by the fact that the scores of Asian test-takers generally equal or exceed that of Euro-Americans (Jensen, 1984). Additionally, in a study conducted by Quay (1971), the Stanford-Binet intelligence test was translated into "Black English" and administered to African American school children. When compared, performance on the translated version of the test was not significantly different than performance on the standard version of the Stanford-Binet test (Loehlin, et al., 1975). As evident, research concerning cultural bias in cognitive ability test construction has been mixed.

Finally, the interactionist theory suggests that heredity and the environment are both causes for differences in cognitive ability test scores between groups (Eysenck, 1984). According to the interactionist theory, individual differences are a product of heredity and their surroundings.

All of these theories, the biological, the environmental, and the interactionist theory, suggest that African Americans have a deficit in intellectual capacity in comparison to others, regardless of how the deficit was created or developed, whether biological or environmental or a combination of the two. An alternative to the above theories or perspectives, the underlying assumption of this study contends that differences in cognitive ability test scores can be explained partly by an individual's belief about his or her ability to perform well on a cognitive ability test--his or her sense of self-efficacy.

Chapter 2

SELF-EFFICACY AND THE DEVELOPMENT OF SUBGROUP DIFFERENCES

Self-Efficacy.

Self-efficacious individuals believe that they possess the necessary knowledge, skill, and ability to successfully complete a given task (Gist & Mitchell, 1992). Self-efficacy is an evaluative belief about oneself which has motivational implications for behaviors and cognitions (Gist & Mitchell, 1992). Self-efficacy differs from self-esteem in that self-efficacy focuses on the potential to perform a specific behavior; whereas, self-esteem deals with one's general assessment or evaluation of the self. Self-efficacy has been suggested as a subcomponent of self-esteem; however, research has also identified that the two constructs are not the same. Thus, although a relationship may exist between self-esteem and self-efficacy, the focus of this investigation is with the task-specific sense of self-efficacy.

When determining level of self-efficacy, people assess their ability to execute a specific behavior. Individuals consider the difficulties and demands of the given situation and their own skills and abilities when evaluating their level of self-efficacy (Cervone, 1989). Ultimately, one's sense of self-efficacy influences thought and behavior, i.e.,

effort expended, persistence, and goal setting (Bandura & Adams, 1977; Gist & Mitchell, 1992).

Assessment of one's ability and potential to perform involves the individual's perceived performance capability, the task to be completed and others in the environment. There are four categories of experiences suggested as being used in the development of self-efficacy: modeling (vicarious learning), verbal persuasion, autonomic arousal and prior performance (Bandura, 1982; Gist & Mitchell, 1992). First, according to Gist and Mitchell (1992) and Bandura (1993), people partly judge what they are capable of doing or their ability by watching and comparing themselves to models--others like themselves, in some manner--performing the intended behavior or task and who also teach appropriate strategies to execute. If the models successfully accomplish the given task, then the observer's sense of self-efficacy may be raised. He or she should believe that he or she can accomplish the task as well as the model did. On the other hand, if the models fail, then the observer's sense of self-efficacy may be lowered and the observer will expect to fail in the attempt to perform the task (Bandura, 1982). Second, positive feedback concerning one's ability or potential can raise one's sense of efficacy; however, failure may negate such a reaction. Verbal persuasion can enhance one's sense of self-efficacy, if it is realistic in the potential accomplishment (Bandura, 1982). Third, physiological states can influence self-efficacy and hamper performance if the signs indicate a "vulnerability to dysfunction" (Bandura, 1982). "Gut feelings" can be indicators of one's potential to perform. Finally, prior performance is the most influential developmental experience of one's sense of self-efficacy because it is based on an actual experience of the intended behavior (Bandura, 1982).

A relationship between performance and self-efficacy can be derived from the notion that prior performance is one of the determinants or ways in which self-efficacy is developed. Schunk (1991) suggested that the most reliable factor when judging the level of self-efficacy was one's own previous performances. How an individual performed on a similar, prior task will influence his or her belief about his or her ability to successfully perform the focal task. Successful completion raises one's sense of self-efficacy and failures diminish it. Furthermore, although Locke, Frederick, Lee, & Bobko (1984) found self-efficacy to be more highly correlated with past performance than future performance, self-efficacy was significantly related to future performance when past performance was partialled out. The relationship between self-efficacy and previous performance suggests that subgroup differences in self-efficacy on cognitive ability tests should be substantiated given the history of African American experiences alluded to above. Consequently, because an individual's belief about what he or she can do affects most aspects of his or her life, self-efficacy judgments should remain predictive of future performance when prior performance and ability are held constant (Pajares & Kranzler, 1995). Further, the partial correlation between self-efficacy and future performance suggests one's belief about what he or she is capable of doing predicts later performance independent of their actual previous performance.

Self-Efficacy, Previous Performance, and Collectivism.

One potential explanation of subgroup differences in self-efficacy may be the fact that, according to Bandura (1986), "self-efficacy is, in part, socially constructed and that such construction may differ as a function of national culture" (Earley, 1994, p.90).

Furthermore, Bandura (1986) suggested that one's belief about his or her ability to

perform a given task is influenced by "maturation and socialization experiences" (Earley, 1994, p.90). Maturation and socialization experiences may differ depending on one's culture and individual- or collective-orientation. Various research studies have led to the notion that those individuals with a collective-orientation may differ in the development of their self-efficacy from those individuals with an individualistic orientation. An individual or collective-orientation represents the feelings or behaviors generated by the degree of self-interest or concern for others that may be exhibited in different magnitudes and in different situations depending on the target persons; the identification of oneself with the group may also depend on the type of group in question (Hui, 1988; Hui & Triandis, 1986). More specifically, individualists "define the self independently of groups . . . believe that they can stand or fall on their own and survive on their own" (Hui, 1988, p.18). On the other hand, collectivists "see the self as an aspect of a group, and value interdependence" (Hui, 1988, p.18). Triandis (1989) stated that Tajifel's (1978) social identity is included in one's collective self. One's social identity refers to that part of one's self image which develops from his (or her) awareness of his (her) membership in a social group (or groups), in addition to the values and emotional significance attached to that membership.

Due to differing orientations, collectivists and individualists sample their environments differently (Triandis, 1989). Research has found that individualists refer to personal information, such as their own performance, when judging their level of self-efficacy; whereas, collectivists refer to in-group information (e.g., the in-group's performance) when determining their ability to perform well on a given task (Triandis, 1989; Erez & Earley, 1993; Earley, 1994). More specifically, results of a study conducted

by Earley (1994) showed that "a collectivist's self-efficacy is based on information that he or she gets about a (work) group, whereas, an individualist's self-efficacy comes from self-referenced cues" (p.115)

In general, as previously stated, people who embrace a collective-orientation define themselves in regards to some reference group; meanwhile individualists define the self independent of salient reference groups. Therefore, prior performances or modeling by members of the referent group may impact the level of self-efficacy for those who are collectively-oriented, but may not affect the level of self-efficacy for those who are individually-oriented. When suggesting differences in level of self-efficacy between African Americans and Euro-Americans, one may focus on the type of developmental experiences of modeling and prior performance. For instance, in regards to cognitive ability tests, the prior performances of African Americans have reportedly been inferior in comparison to Euro-Americans. Awareness of this information in addition to one's collective- or individualistic-orientation may differently influence the level of self-efficacy for African Americans and Euro-Americans. African Americans who are aware of the difference in performance scores on cognitive ability tests between African Americans and Euro-Americans, with Euro-Americans outperforming African Americans, may identify with other African Americans who have reportedly done poorly on cognitive ability tests in comparison to Euro-Americans and this identification with the African American population may dampen their sense of self-efficacy. On the other hand, Euro-Americans who are collectively-oriented and are aware of the superior performance of fellow Euro-Americans on cognitive ability tests in comparison to African Americans may have their level of self-efficacy enhanced due to this knowledge.

Contrary to the impact that the referent group has on the development of a collectivist's level of self-efficacy, an individualist's level of self-efficacy will not be affected by the superior or inferior prior performance of a specific reference group because he or she views the self independent of his or her race, age group, or class. While collectivists and individualists may develop their sense of self-efficacy in different ways, these two orientations are also differently embraced by the African American community and the Euro-American culture.

Collectivism and Subgroup Status

In general, individuals develop their impression of themselves through social relationships and social group memberships. Social comparison theory proposes that people compare themselves with others in order to understand and evaluate their own behavior. In particular, individuals engage in self-categorization by which a person identifies with or internalizes the social category of which he or she is a member. For example, Gecas and Schwalbe (1983) state that individuals see themselves in their reference groups and significant others. A referent group is a particular group of people, similar to ourselves in certain key ways (i.e., gender, race, or age), used as a standard in social comparisons. A person defines, describes and evaluates the self in regards to this social category or label (Hogg & Turner, 1987). As a result, perception of one's self is biased and is more closely aligned with the stereotypic characteristics (i.e., "African Americans are not as intelligent as Euro-Americans.") and norms of the group in which he or she belongs. Research has shown that "group members and nonmembers expect individuals to adhere to corresponding group identity and norms" (Arroyo, & Zigler,

1995, p.903). In particular, as previously stated, collectivists define themselves in relation to the group of which they are members.

According to Gaines (1994), the African American community embraced the cultural norm of collectivism--a concern for the entire group; whereas, the Euro-American community was oriented toward the concern for oneself--individualism. Oyserman, et al (1995) suggested that African Americans possess a higher sense of collectivism and ethnic identity than Euro-Americans. Additionally, Phinney (1996) suggested that Western industrialized countries stress the importance of the individual over the group and view the self as "independent, autonomous, and self-contained" (Phinney, 1996). On the other hand, a number of non-Western countries, such as Africa, stress the priority of the group over the individual and view the self as "interdependent and connected." In particular, members of the Asian, African, and Latin American communities are assumed to reflect an emphasis on dependence on one another and the importance of the group as opposed to the idea of independence and survival of the fittest (Phinney, 1996). Furthermore, according to Waters (1990), most Euro-Americans do not readily identify themselves according to their ethnic background due to the lack of salience of one's culture (Phinney, 1996) as opposed to how it is for members of other ethnic groups where ethnicity is obvious, simply by the color of one's skin, for example (Phinney, 1996). According to research the more salient one's ethnic identity, the greater its influence on the development of one's identity and how he or she views himself or herself (Phinney, 1996). Also, Gaines and Reed (1995) determined that there are psychological consequences of "belonging to a group that has been oppressed or exploited throughout an historical period" (Phinney, 1996, p. 97). One of the consequences may be

the emphasis on the importance of the group over the importance of the individual-- showing a preference for collective values (Phinney, 1996). For African Americans, this oppression came in the form of slavery, segregation and discrimination. In sum, African Americans are thought to be members of a collective community, their ethnic identity is salient and have been oppressed historically fostering a collective sense of self-efficacy. On the other hand, Euro-Americans are predisposed to individualistic values, in addition to the absence of salient features of ethnicity and the lack of historical oppression and exploitation. Therefore, if African Americans are more collectively-oriented, then the prior performances of African Americans as a whole and the observation of fellow African Americans may influence the self-efficacy of the individual African American applicant due to his or her identification with the members of his race.

Research by Fordham and Ogbu (1986) revealed that poor academic achievement by African Americans represented their need to maintain a sense of unity with their own cultural community (Arroyo & Zigler, 1995). Findings suggested that African American students who strive for academic achievement engage in behaviors and possess attitudes and values reflective of the majority Euro-American community as opposed to their own cultural community. These behaviors and experiences of academically achieving African American students have been termed *racelessness* (Fordham & Ogbu, 1986). In testing the concept of racelessness, Arroyo and Zigler (1995) found that African American students possessing a sense of racelessness were more likely to accept derogatory stereotypes about their group, such as "In general, Blacks are to blame for their negative image among Whites" (p. 905). For African Americans who believed that public perception of their ethnic group was negative, they too "lowered their evaluations of and

identification with their racial group" (Arroyo & Zigler, 1995, p.911). Additionally, a negative relationship was also observed between stereotyped beliefs about academic performance of African Americans and their support of commonly held stereotypes and an African American's identification with their ethnic group (Arroyo & Zigler, 1995). Based on study results, the greater the agreement with negative stereotypes of African Americans by African Americans, the less they identified with the African American community and the less important one's group was to the definition of oneself. Consequently, the stereotypes, such as "African Americans are cognitively inferior to Euro-Americans," may be related to an African American's attempt to define the self independent of the African American community. Conversely, African Americans who responded that one's social group membership was important to how one viewed and defined the self also expressed a higher level of confidence in their strengths and abilities-self-efficacy (Arroyo & Zigler, 1995).

According to Steele (1988), African Americans who indicate ethnicity on a standardized test of cognitive ability were reminded of their ethnic identity (Oyserman, et al, 1995). This identification heightened "connectedness" and the obstacles faced by African Americans, such as public perception, became more salient to the individual African American, thereby discouraging the exertion of effort. Cervone (1989) found that individuals who concentrated on potential obstacles and difficulties of a cognitive task reported lower beliefs of performance capabilities than those who focused on aspects of themselves or the task that could improve performance or those who did not consider either. Consequently, subgroup differences in self-efficacy may be a function of one's cultural identity towards collectivism or individualism and how these orientations, in

conjunction with information about the group, impact one's development of his or her belief about his or her ability to perform successfully. Furthermore, this identification with the group by African Americans may hinder the development of a high level of self-efficacy for performance on cognitive ability tests due to the awareness of differences in cognitive ability test scores and poorer performances.

Subgroup Differences in Self-Efficacy

To date, limited research has investigated subgroup differences in self-efficacy; however, researchers have found African American-Euro-American differences in self-efficacy. For instance, Oyserman, et al., (1995) stated that the level of general self-efficacy was lower among African Americans than Euro-Americans. In particular, Pajares and Kranzler (1995) found a significant relationship between math self-efficacy and race. More specifically, a significant mean difference in math self-efficacy between African Americans and Euro-Americans was observed with African Americans reporting a lower sense of math self-efficacy.

Due to the limited existing research suggesting that African Americans are more collective and Euro-Americans are more individualistic and the potential influence of negative stereotypical beliefs about African Americans' performance on cognitive ability tests, the resulting level of self-efficacy between African Americans and Euro-Americans may show a greater belief by an Euro-American for his or her ability to perform well on cognitive ability tests than an African American. Using this summary of research on self-efficacy, individualism-collectivism, and the experiences of African Americans and Euro-Americans, I have formulated the following hypotheses:

Hypothesis 1: Differences in self-efficacy on cognitive ability tests will exist between African Americans and Euro-Americans, with that of Euro-Americans being higher.

Hypothesis 2: The relationship between race and self-efficacy is moderated by one's individual-collective orientation (See Figure 1), such that African Americans and Euro-Americans will not differ significantly if they have an individualistic-orientation, but will differ significantly as orientation towards others or the group increases.

Hypothesis 3a: African Americans who are collectively oriented and are aware of the difference in performance scores on cognitive ability tests between African Americans and Euro-Americans will possess a lower sense of self-efficacy than those African Americans who are collectively oriented and are not aware of the differences in performance scores. On the other hand, African Americans who are individually-oriented and are aware of the difference in performance scores between African Americans and Euro-Americans will not possess a significantly different level of self-efficacy than those African Americans who are individually-oriented and are unaware of the difference in performance scores between African Americans and Euro-Americans (See Figure 2a).

Hypothesis 3b: Euro-Americans who are collectively-oriented and are aware of the difference in performance scores on cognitive ability tests between African Americans and Euro-Americans will possess a higher sense of self-efficacy than those Euro-Americans who are collectively-oriented and unaware of the difference in performance scores. On the other hand, Euro-Americans who are individually-oriented and are unaware of the difference in performance scores between African Americans and Euro-Americans will not possess a significantly different level of self-efficacy than those Euro-

Americans who are individually-oriented and are aware of the difference in performance scores (See Figure 2b).

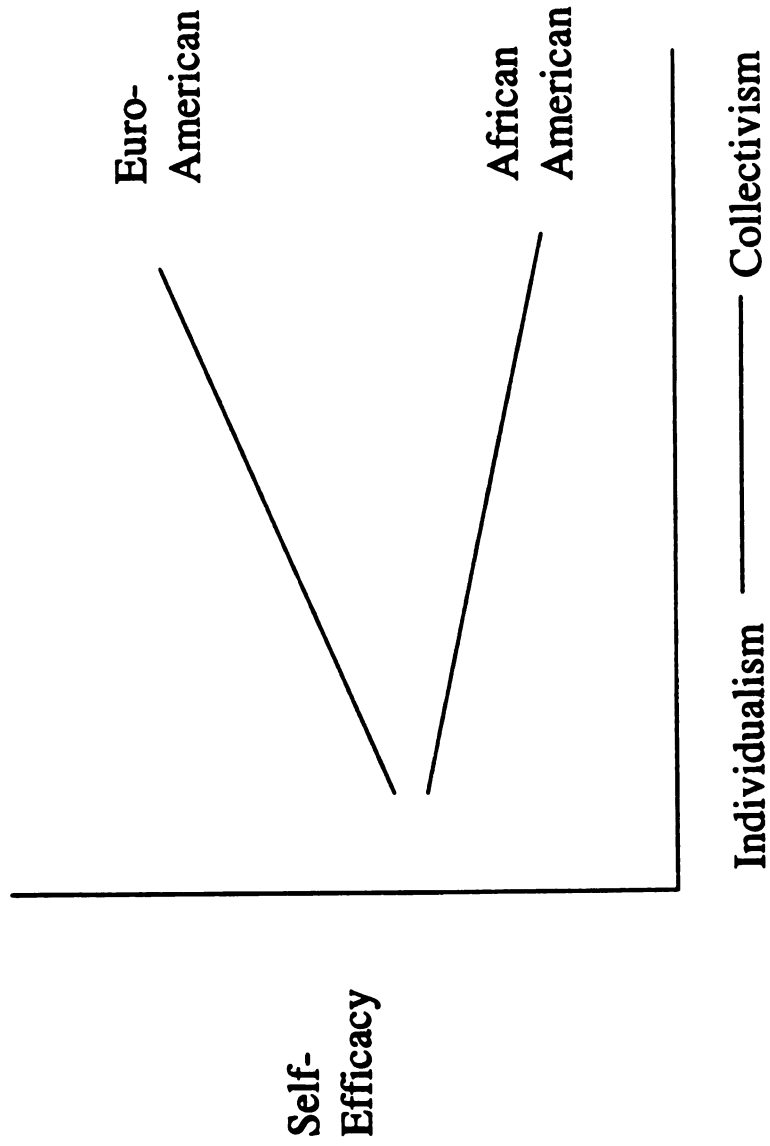


Figure 1 - Interaction between Race and Individualism-Collectivism

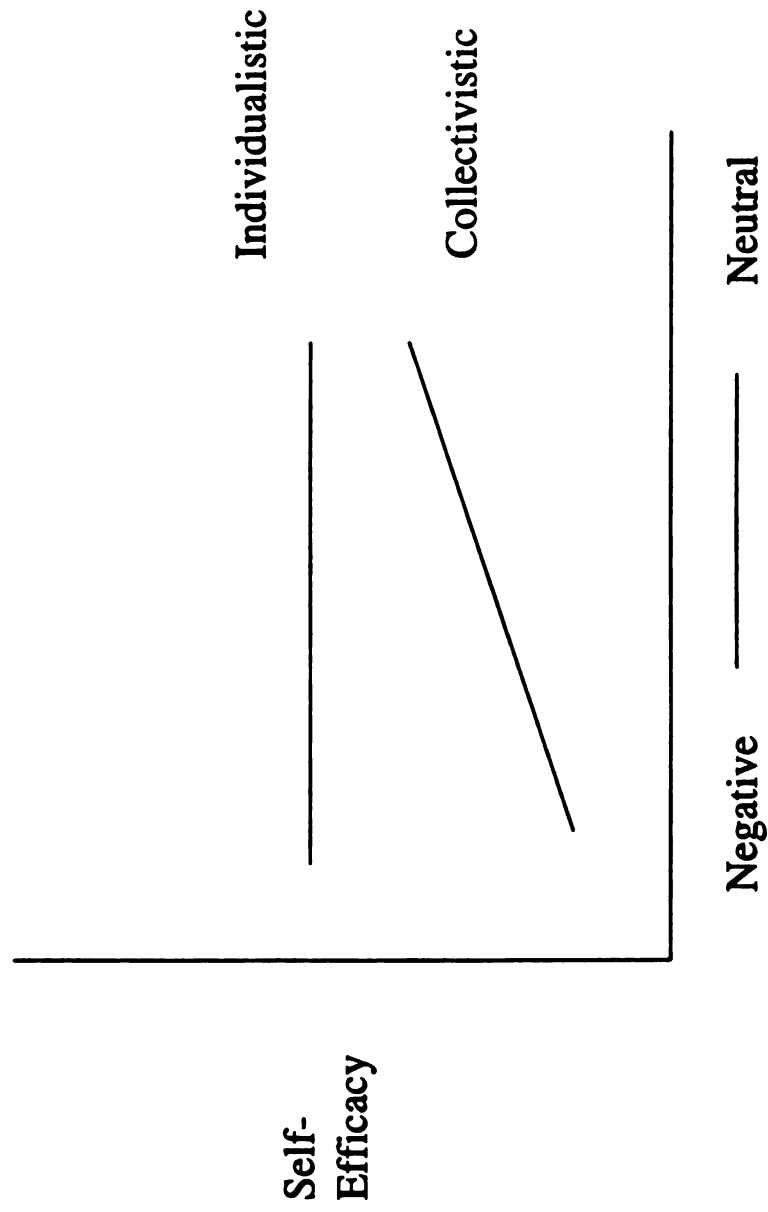


Figure 2a - Interaction between Race, Individualism-Collectivism, & Awareness & Beliefs about African Americans held by African Americans

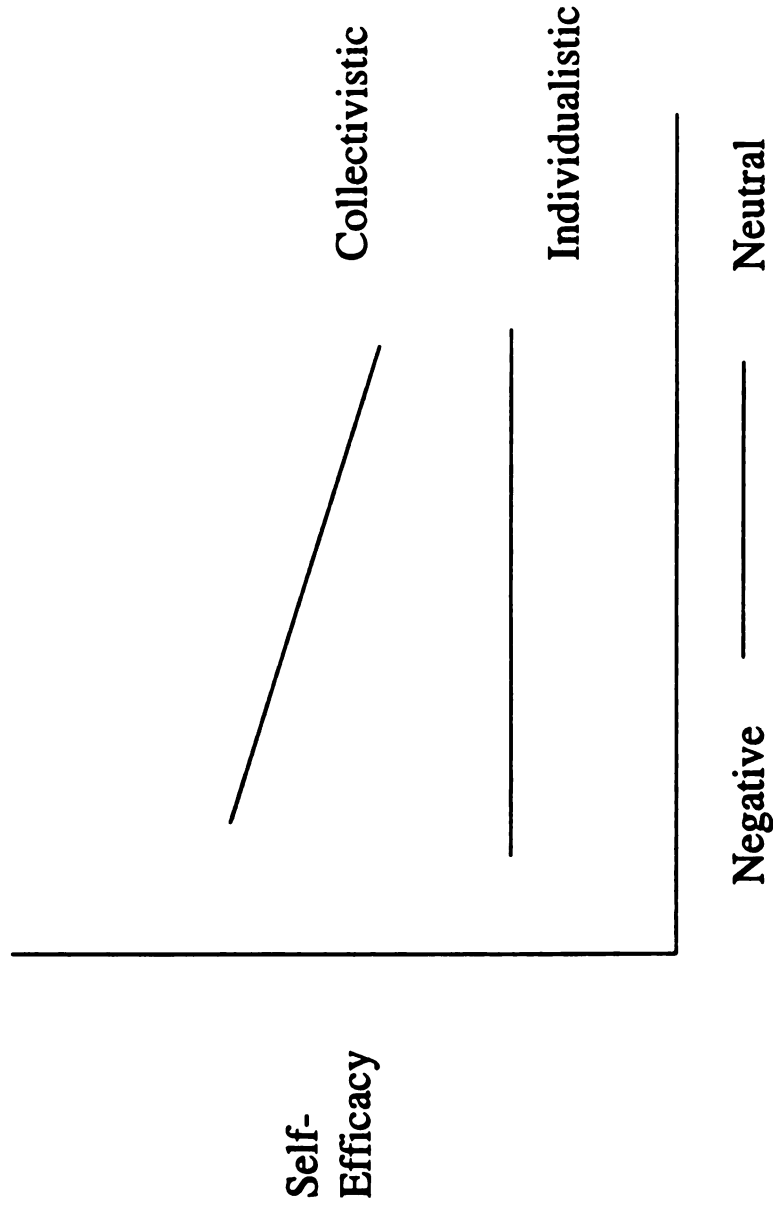


Figure 2b - Interaction between Race, Individualism-Collectivism, & Awareness
& Beliefs about African Americans held by Euro-Americans

Chapter 3

HOW SELF-EFFICACY INFLUENCES PERFORMANCE AND MODERATING FACTORS

Self-Efficacy and Performance

In order to successfully execute behaviors to accomplish a given task, an individual must believe that they possess and can utilize the necessary skills (Eyring, Steele Johnson, & Francis, 1993). According to Bandura (1983), there is a difference between possessing the required knowledge and skills to perform a given task and actually being able to utilize those skills. Furthermore, Bandura (1982) suggested that "if self-efficacy is lacking, people tend to behave ineffectually even though they know what to do." Findings from a study conducted by Bouffard-Bouchard (1989) showed, despite the fact that the individual possessed the necessary skills to perform the task, "perceived self-efficacy operates partially independently of those skills" (p.361). In studies conducted by Collins (1982; 1984), the relationship between self-efficacy and ability and its impact on performance were investigated (Bandura, 1982; Bouffard-Bouchard, 1989). The findings (Collins, 1982) demonstrated that self-efficacy predicts motivation and achievement across levels of ability (Bandura, 1982). Regardless of ability level, those

students with a high sense of self-efficacy performed better than those students with a low sense of self-efficacy (Bandura, 1982). Additionally, Collins (1984) found that although mathematical ability contributed to performance at each level, those possessing a high sense of self-efficacy outperformed those with a low sense of self-efficacy (Bouffard-Bouchard, 1989). With cognitive ability being held constant, self-efficacy had a direct effect on performance. Consequently, in order to achieve, one must not only possess the knowledge, skills and ability necessary to perform, but also believe that they have what it takes to perform the task; therefore, applicants possessing the same KSAs may vary in performance due to their individual beliefs about their capacity to perform.

Many researchers concur that performance is a function of ability and motivation (Ruvolo & Markus, 1992; Chan, Schmitt, Deshon, Clause, & Delbridge, 1996). Further, Eden and Kinnar (1991) state that self-efficacy is a key determinant of work motivation. It contributes to motivation in the goals that people set, the effort expended and their persistence despite obstacles. According to Bandura (1988b), "self-efficacy mediates the translation of knowledge and abilities into skilled performance" (Gist & Mitchell, 1992, p.202). Self-efficacy indirectly effects performance by influencing initiation, the amount of effort expended, goals set, and persistence (Bandura & Adams, 1977; Bandura, 1982; Locke, et al, 1984; Gist & Mitchell, 1992; Ruvolo & Markus, 1992). If an individual believes that he or she possesses the necessary skills and ability to perform, then he or she will initiate the behavior, set higher goals, exert energy to accomplish the task, and continue in the behavior despite obstacles. Bouffard-Bouchard (1989) and Cervone (1989) found that perceived self-efficacy was significantly related to task persistence. In particular, Multon, Brown, and Lent (1991) found one's sense of self-efficacy accounted

for approximately 12% of the variance in academic persistence. This finding supports Bandura's (1982) contention that one's belief in his or her ability to perform contains a motivational component that influences initiation and persistence in order to achieve a desired outcome.

Researchers have also found that self-efficacy demonstrates a direct effect on performance. Regardless of the type of developmental experience, whether vicarious learning, prior experience or extinction of anxiety, one's belief in his or her ability to perform predicts his or her eventual performance (Bandura & Adams, 1977). Furthermore, according to Bandura (1982), performance varies as a function of one's belief in his or her ability to execute the necessary behavior. As one's sense of self-efficacy increases, his or her performance increases as well. Likewise, at the group level, those groups with the higher level of self-efficacy outperformed those with a lower level of self-efficacy (Bandura, 1982). In a study conducted by Multon, et al (1991), self-efficacy beliefs accounted for approximately 14% of the variance in student's academic performance. Zimmerman, Bandura, and Martinez-Pons (1992) found that perceived self-efficacy was significantly predictive of final course grade. Further, Pintrich and DeGroot (1990) found that self-efficacy was significantly related to student performance on seatwork, exams/quizzes, and essays/reports. The more a student believed that he or she had what it took to successfully complete a task, the better the student performed. Research by Weinberg, Gould, and Jackson (1979) further supported prior research that self-efficacy beliefs directly influence performance. Study results showed that high self-efficacy individuals outperformed those with a low sense of self-efficacy. Likewise, Tuckman and Sexton (1990) found a significant relationship between what people

believed they could do and performance. High believers outperformed their personal expectations; whereas, low believers did not perform as well as they had anticipated.

Cooper and Robinson (1991) and Pajares and Kranzler (1995) found, more specifically, a correlation between math self-efficacy and math performance. In addition, Pajares and Kranzler (1995) found a significant direct effect of math self-efficacy on math performance. As a result, Pajares and Kranzler (1995) contended that one's sense of self-efficacy in regards to math capability strongly predicted his or her later academic performance in that area. In combination, the findings regarding the relationship between self-efficacy and performance and the fact that self-efficacy beliefs account for variance in performance when KSAs are held constant can partially explain varying performances between individuals who possess similar KSAs. In particular, these findings may potentially explain some of the variance in performance scores on various selection measures between African American and Euro-Americans. If there is a significant difference in level of self-efficacy between African Americans and Euro-Americans, performance differences may result.

For some positions or jobs, cognitive ability has been identified as necessary to execute the requisite behaviors. Consequently, some of the selection measures utilized assess cognitive ability. The greatest difference in performance scores between African Americans and Euro-Americans has been observed on cognitive ability measures. As stated, repetitively, intelligence tests have shown that, on the average, the scores of African Americans are one standard deviation, or 15 IQ points, lower than that of Euro-Americans (Manning & Jackson, 1984; Hunter & Hunter, 1986; Gottfredson, 1988; Wollack, 1994). Cognitive ability represents an underlying and broad capacity for

reasoning, abstract thinking, problem solving, and related skills (Snyderman & Rothman, 1986). According to Gottfredson (1988), the predictability of cognitive ability tests is better than that of other predictors primarily because of its relation to general mental ability. Some of the predictors used as pre-employment selection measures are more related to general mental ability than others; the more related a measure is to general mental ability, the greater the adverse impact between African Americans and Euro-Americans (Lynn & Owens, 1993). Jensen (1985) also supported this contention in that he found a significant relationship between an ability test's g loading and the degree of difference between African Americans and Euro-Americans (Lynn & Owens, 1993). As already stated, African Americans have reportedly scored lower on cognitive ability tests than Euro-Americans; therefore, if African Americans are confronted with a selection measure that looks like it assesses cognitive ability, this perception may influence one's sense of self-efficacy, which eventually may negatively impact their performance on the measure more so than Euro-Americans.

In a series of studies conducted by Steele and Aronson (1995), it was hypothesized that African Americans would do poorly on a standardized cognitive ability test if the measure was presented as assessing a facet of one's intellectual capacity or, simply if African Americans perceived the test to assess cognitive ability. The resultant behavior would be the consequence of what the authors referred to as "stereotype threat." According to Steele and Aronson (1995), a stereotype threat is "being at risk of confirming, as a self-characteristic, a negative stereotype about one's group" (p. 797). For African Americans, in particular, this stereotype threat is manifested by the notion that "whenever African American students perform an explicitly scholastic or intellectual task,

they face the threat of confirming or being judged by a negative social stereotype-a suspicion-about their group's intellectual ability and competence" (Steele & Aronson, 1995, p. 797). As a result, this threat was predicted to hamper African Americans' performance on the cognitive ability test. Results of the studies showed that African Americans do perform poorly on cognitive ability tests in comparison to Euro-Americans when the measure is expressed as an assessment of intellect (Steele & Aronson, 1995). Additionally, Steele and Aronson (1995) found that African Americans who were anticipating a measure to assess their cognitive ability showed "greater cognitive activation of stereotypes about African Americans, and greater activation of concerns about their ability" than African Americans who were not expecting such a test (p. 805). Findings also showed that heightening awareness of racial group membership hampered African Americans performance on a verbal test although the test was not presented as assessing cognitive ability. This series of studies highlights the differences in performance on cognitive ability tests between African Americans and Euro-Americans when African Americans are aware of the stereotype that "African Americans are cognitively-inferior in comparison to their Euro-American counterparts" and perceive the measure as assessing cognitive ability. Extending this line of research, this study will focus on whether the knowledge of and belief in such a stereotype differentially impacts African Americans who are individually-oriented in comparison to African Americans who are collectively-oriented. Likewise, it will address how such a stereotype may impact the level of self-efficacy for African Americans.

Hypothesis 4: A positive relationship exists between performance on cognitive ability tests and self-efficacy when previous performance on cognitive ability tests is held constant.

Hypothesis 5: The interaction between race and level of self-efficacy will influence performance on the cognitive ability test. The mean difference in performance scores between African Americans and Euro-Americans will be smaller at a higher level of self-efficacy than the mean difference between the two subgroups observed at lower levels of self-efficacy (See Figure 3).

In sum, a potential explanation to adverse impact in selection testing--subgroup differences in self-efficacy--will be tested. The model in Figure 4 represents the various hypotheses detailed above. It is hypothesized that race directly influences one's level of self-efficacy with respect to performance on cognitive ability tests (Hypothesis 1).

African Americans will possess a lower sense of self-efficacy than Euro-Americans. The relationship between race and self-efficacy is also moderated by one's individual-collective orientation (Hypothesis 2). African Americans are more collectively-oriented in general and this collective orientation leads to a lowered sense of self-efficacy compared to those possessing an individualistic orientation. The effect of the collectivism orientation of African Americans will result in further losses in self-efficacy when African Americans are aware of the disparity in performance scores on cognitive

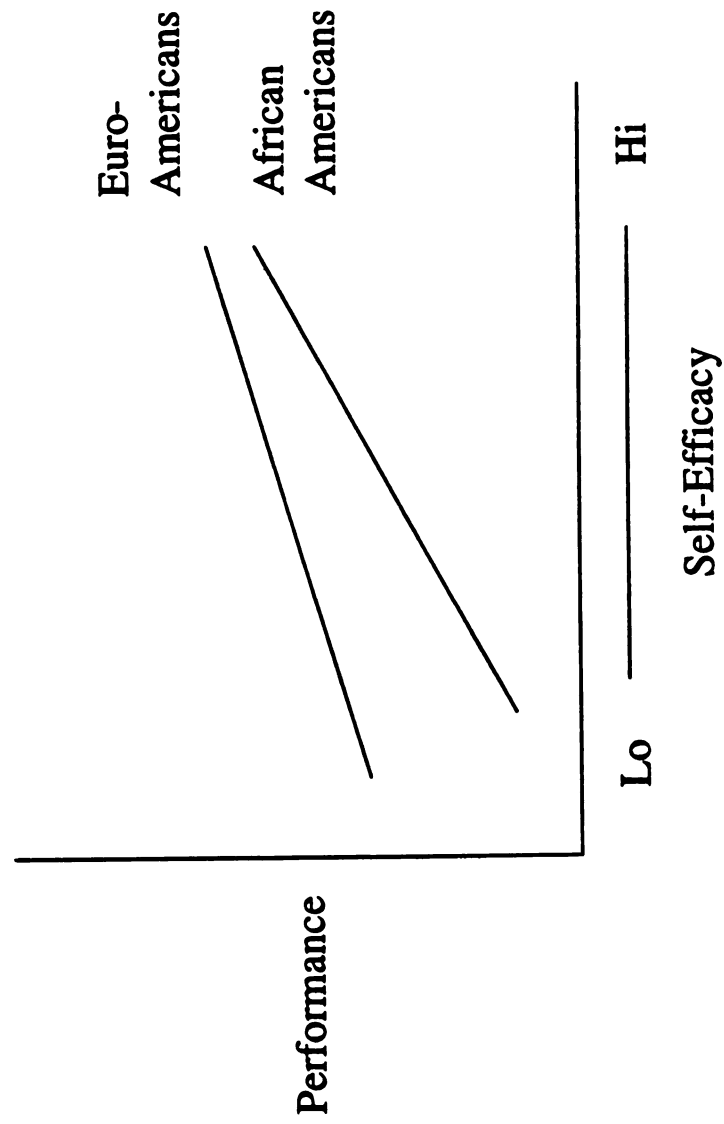


Figure 3 - Interaction between Race and Level of Self-Efficacy

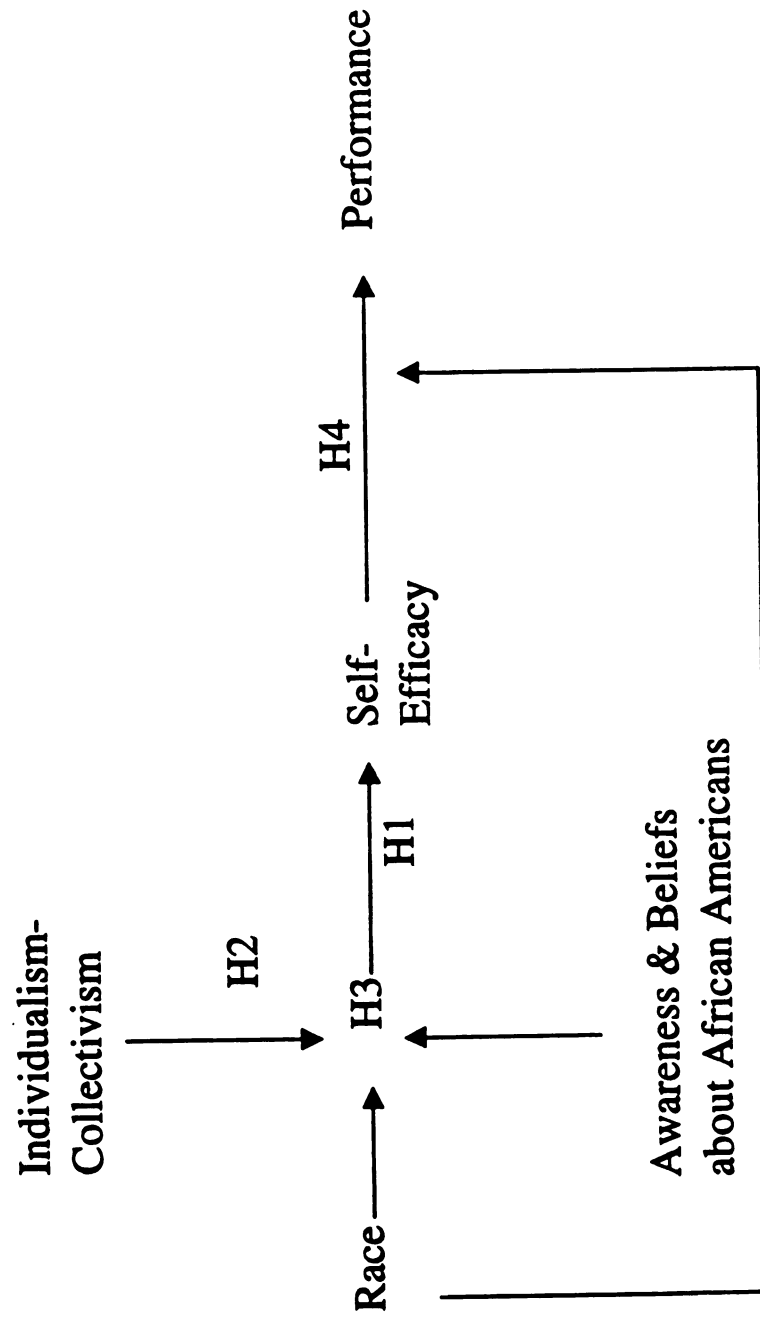


Figure 4 - Model of Theory

ability tests between African Americans and Euro-Americans, with Euro-Americans outperforming African Americans. (Hypothesis 3). For Euro-Americans, those who are collectively-oriented will possess a significantly higher level of self-efficacy than those who are individually-oriented, if a significant difference is observed. As before, this relationship is moderated by the awareness of the difference in cognitive ability test scores with Euro-Americans outperforming their African American counterparts. Therefore, a race x collective- or individualist-orientation x beliefs about group interaction is predicted. The nature of the interaction is depicted in Figure 2a and Figure 2b. Next, as supported in the literature, a positive relationship between self-efficacy and performance is hypothesized (Hypothesis 4). Those who believe that they possess the ability to perform well on a cognitive ability test will outperform those who possess a lower sense of self-efficacy in comparison. Finally, the hypothesized relationship between self-efficacy and performance will be moderated by race (Hypothesis 5). The performance of an African American on a cognitive ability test will be significantly affected by his or her level of self-efficacy. Those African Americans with a high sense of self-efficacy for the cognitive ability test will outperform those African Americans with a lowered sense of self-efficacy. Likewise, Euro-Americans who possess a high sense of self-efficacy for the cognitive ability test will score higher on the cognitive ability test than those Euro-Americans who have a lower belief in their ability to perform well. However, the magnitude of the difference in African American versus Euro-American performance scores on cognitive ability tests will be greater when the level of self-efficacy is low than when self-efficacy is high (See Figure 3).

Chapter 4

Method

Subjects.

See Appendix A for the power analysis for estimation of the necessary sample size. A total of 110 African American and 101 Euro-American undergraduate students from a midwestern, predominantly Euro-American university and a midwestern minority research conference participated in this study. Sixty-two percent of the examinees were female and thirty-six percent were male. Ages ranged from 17 to 39.

Measures.

The measures utilized to assess cognitive ability were subtests of the Air Force Officer Qualifying Test (AFOQT) Form O (Skinner & Ree, 1987). The AFOQT Form O is a paper-and-pencil measure with multiple-choice questions constructed for group administration (Skinner & Ree, 1987, p. 1). The two subtests of the AFOQT Form O chosen were the verbal analogies subtest and the math knowledge subtest. According to the publishers, these two subtests were correlated, $r = .55$.

The AFOQT verbal analogies subtest taps the verbal factor (Skinner & Ree, 1987). It measures "ability to reason and recognize relationships between words"

(Skinner & Ree, 1987, p.24). The subtest contains 25 questions. The reported internal consistency/reliability using coefficient alpha = .80. Discrimination values (item-total correlation; r_{bis}) for this subtest ranged from .43 to .78. See Skinner & Ree (1987) for a reproduction of the Verbal Analogies subtest.

The AFOQT math knowledge subtest taps the quantitative factor (Skinner & Ree, 1987). It measures "ability to use learned formulas, mathematical terms, and relationships" (Skinner & Ree, 1987, p.24). The subtest consists of 25 questions. The reported internal consistency/reliability using coefficient alpha = .88. Discrimination values (item-total correlation, r_{bis}) ranged from .43 to .84. See Skinner & Ree (1987) for a reproduction of the Math Knowledge subtest.

The individualism-collectivism measure was adapted from the Wagner (1995) Individualism-Collectivism Measure. This measure assesses five specific aspects of individualism-collectivism (Wagner, 1995, p. 161): (a) five items assess one's "personal independence and self-reliance;" (b) the next five items measure the "importance accorded to competitive success;" (c) the next three items assess the "value attached to working alone;" (d) the next four items measure the "espousal of norms about the subordination of personal needs to group interests;" and (e) the final three items assess the "beliefs about the effects of personal pursuits on group productivity." In sum, the complete individualism-collectivism measure consists of twenty items with a Likert-response format ranging from 1 (completely disagree) to 5 (completely agree). See Table 1 for the individualism-collectivism scale intercorrelations and reliabilities. Refer to Appendix C for the individualism-collectivism scale.

An individual's awareness of and acceptance or belief in the reported difference in cognitive ability test scores between African Americans and Euro-Americans was assessed with six items. Responses to the items were indicated on a Likert-format ranging from 1 (completely disagree) to 5 (completely agree). The six test items were: (1) I am aware that African Americans score lower on intelligence tests than Caucasians; (2) I am aware that research has found Caucasians to score 15 points higher than African Americans on intelligence tests; (3) I have read reports that African Americans do not do as well as Caucasians on intelligence tests; (4) Caucasians are smarter than African Americans; (5) Caucasians do better on intelligence tests than African Americans; and (6) African Americans possess less intellectual ability than Caucasians. See Appendix D for a reproduction of the Awareness/Belief Measure.

The self-efficacy measure consisted of 5 items assessing the subject's belief about his or her capability to perform well on the given test. Responses to four of the questions were indicated on a Likert-format, with a range from 1 (completely disagree) to 5 (completely agree). These items were: (1) I am confident that I will do well on the verbal analogies subtest; (2) I will earn one of the top scores on the verbal analogies subtest; (3) I believe that I will have no problems on the verbal analogies subtest; and (4) Compared to other subjects, I will perform well on the verbal analogies subtest. The final self-efficacy item also has a Likert-format response scale ranging from 1 = 20% to 5 = 100%, in which subjects responded to "What percentage of the 25 verbal analogy problems do you think you will answer correctly?". See Appendices H and K for reproductions of the self-efficacy measures.

A demographics questionnaire requested information about the subject, such as race, gender, self-reported GPA and self-reported past performance on similar tests such as the SAT or ACT. See Appendix 2 for the reproduction of the Demographic questionnaire. These items were used to describe the sample and the self-reported ACT or SAT test scores were utilized to evaluate Hypothesis 4.

Procedure.

Before the administration of either cognitive ability subtest, all subjects were given a demographics questionnaire and measures to assess their individual-collective orientation. Subjects' awareness of and belief in the disparity between African Americans and Euro-Americans on cognitive ability tests were assessed but counterbalanced. Half of the subjects received the beliefs measure following completion of the individual-collective orientation measure; the other half of the sample completed the beliefs scale following completion of the math knowledge test. Prior to completing the cognitive ability subtests, subjects were given general directions about the subtests and one example (See Appendix E). Next, a brief description of the verbal analogies subtest (Appendix F) along with five example items were provided (See Appendix G), then subjects were asked to respond to self-efficacy items corresponding to the verbal analogies subtest. Once the verbal analogies subtest was completed, subjects were given a brief description of the math knowledge subtest (See Appendix I) in addition to five example items (See Appendix J). Then, subjects were asked to respond to the self-efficacy items about the math knowledge subtest. Once subjects responded to the self-efficacy items, the math knowledge subtest was administered. Subjects were then debriefed.

Table 1^a

Scale Reliabilities and Factor Intercorrelations of Individualism-Collectivism Measure

Factors	1	2	3	4	5
Collectivism 1	.72 ^b				
Collectivism 2	.50**	.79 ^b			
Collectivism 3	.30**	.09	.83 ^b		
Collectivism 4	.03	.15**	.05	.80 ^b	
Collectivism 5	.19**	.19**	-.05	.29**	.76 ^b

^a Reprinted from Wagner, 1995.

^b Statistic is a coefficient alpha reliability estimate.

** $p < .01$

Chapter 5

DATA ANALYSES

Hypothesis 1: Differences in self-efficacy on cognitive ability tests will exist between African Americans and Euro-Americans, with that of Euro-Americans being higher. *This hypothesis was tested with a t-test to determine if there was a significant mean difference between African Americans and Euro-Americans in the level of self-efficacy for both math and verbal tests .*

Hypothesis 2: The relationship between race and self-efficacy is moderated by one's individual-collective orientation. *Self-efficacy for both math and verbal tests was regressed on race, individualism-collectivism and the product of race and individualism-collectivism. A significant product term in this regression contributed support for Hypothesis 2. The individualism-collectivism construct was multidimensional and the analyses were repeated for each dimension. A plot of this interaction would indicate whether the form of the interaction supported the hypothesis (See Figure 1).*

Hypothesis 3a: African Americans who are collectively oriented and are aware of the difference in performance scores on cognitive ability tests between African Americans and Euro-Americans will possess a lower sense of self-efficacy than those

African Americans who are collectively oriented and are not aware of the differences in performance scores. On the other hand, African Americans who are individually-oriented and are aware of the difference in performance scores between African Americans and Euro-Americans will not possess a significantly different level of self-efficacy than those African Americans who are individually-oriented and are unaware of the difference in performance scores between African Americans and Euro-Americans. *Moderated regression was used to test this hypothesis. Self-efficacy for both math and verbal tests was regressed on race, individualism-collectivism, beliefs about group, and the three two-way interactions and the three-way interaction. The individualism-collectivism construct was multidimensional and the analyses were repeated for each dimension. A statistically significant three-way interaction was taken as evidence of support for Hypothesis 3a. The interaction was plotted to determine if the form of the interaction supported the hypothesis (See Figure 2a).*

Hypothesis 3b: Euro-Americans who are collectively-oriented and are aware of the difference in performance scores on cognitive ability tests between African Americans and Euro-Americans will possess a higher sense of self-efficacy than those Euro-Americans who are collectively-oriented and unaware of the difference in performance scores. On the other hand, Euro-Americans who are individually-oriented and are unaware of the difference in performance scores between African Americans and Euro-Americans will not possess a significantly different level of self-efficacy than those Euro-Americans who are individually-oriented and are aware of the difference in performance scores. *Moderated regression also was used to test hypothesis 3B. Self-efficacy for both math and verbal tests was regressed on race, individualism-collectivism, beliefs about*

group, and the three two-way interactions and the three-way interactions. The individualism-collectivism construct was multidimensional and the analyses were repeated for each dimension. A statistically significant three-way interaction was taken as evidence of support for Hypothesis 3b. Again, the interaction was plotted to determine if the form of the interaction was as hypothesized (See Figure 2b).

Hypothesis 4: A positive relationship exists between performance on cognitive ability tests and self-efficacy when previous performance on cognitive ability tests is held constant. *This hypothesis was analyzed by computing the correlation between performance on cognitive ability tests and self-efficacy for both math and verbal tests when prior performance on cognitive ability tests was held constant. Support for Hypothesis 4 would be the statistical significance of this partial correlation.*

Hypothesis 5: The interaction between race and level of self-efficacy will influence performance on the cognitive ability test. The mean difference in performance between African Americans and Euro-Americans will be smaller at higher levels of self-efficacy than the mean difference between the two subgroups observed at lower levels of self-efficacy. *Self-efficacy for both math and verbal tests was regressed on race, individualism-collectivism and the product of race and individualism-collectivism. A significant product term in this regression would constitute support of Hypothesis 5. The individualism-collectivism construct was multidimensional and the analyses were repeated for each dimension. A plot of this interaction indicated whether the form of the interaction supported the hypothesis (See Figure 3).*

Chapter 6

RESULTS

Descriptive statistics (i.e., means and standard deviations), reliabilities and variable intercorrelations for the entire sample are shown in Table 2. Descriptive statistics for each subgroup are found in Table 3 and variable intercorrelations are presented in Table 4.

Prior to conducting tests of the study hypotheses, the individualism-collectivism measure was analyzed to determine the factor structure. Five factors--(1) "personal independence and self-reliance;" (2) "importance accorded to competitive success;" (3) "value attached to working alone;" (4) "espousal of norms about the subordination of personal needs to group interests;" and, (5) "beliefs about the effects of personal pursuits on group productivity"--were identified through principal factors analysis with varimax rotation of five factors. Five factors were rotated based on a consideration of factor loadings and eigenvalues. These factors were consistent with previous analyses of the same instrument (Wagner, 1995). Since five factors seem to be replicated in various studies of this instrument including the data collected in this study, all subsequent analyses were repeated for each of the five factors. The relatively low

Table 2 - Means, Standard Deviations and Scale Intercorrelations for Entire Sample

	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Race	1.48	.50														
Gender	1.63	.48	-.04													
Self-Report																
Cog Ability	21.79	3.50	.35*	-.03												
Obtained																
Cog Ability	21.55	3.39	.44*	-.07	.94*											
Beliefs	13.96	4.05	-.05	-.16*	.08	.11	(.73)									
Coll1	15.29	4.10	-.06	-.06	-.08	-.11	.07	(.70)								
Coll2	17.20	3.76	-.09	.14*	-.14*	-.15*	.06	.33*	(.70)							
Coll3	9.52	2.54	-.02	-.08	-.06	-.03	.06	.10	.15*	(.74)						
Coll4	16.51	2.53	-.06	.00	.05	.07	-.03	-.08	-.03	.18*	(.79)					
Coll5	11.84	2.39	-.06	-.10	.03	.07	-.07	.15*	.05	.15*	.24*	(.75)				
Vrb Sif-Eff	16.49	4.01	-.22*	-.12*	.19*	.19*	.16*	-.05	-.10	.06	.09	.12*	(.90)			
Mth Sif-Eff	14.93	5.28	-.14*	-.27*	.10	.16*	-.04	-.02	-.10	.09	.10	.07	.25*	(.96)		
Verb Perf	12.37	3.73	.15*	-.06	.59*	.63*	.14*	-.01	-.09	-.03	-.02	-.05	.14*	.10	(.70)	
Mth Perf	12.24	5.00	.22*	-.16*	.49*	.61*	.07	.02	-.11	.03	.01	-.08	.07	.36*	.36*	(.79)

Note: Race was coded as African American = 1 and Euro-American = 2. Gender was coded as Males = 1 and Females = 2. Coll1 stands for Collectivism factor 1 and the other factors are displayed in a similar fashion. Numbers in parentheses are coefficient alphas. * $p < .05$

Table 3 - Means and Standard Deviations for African Americans and Euro-Americans

Measures	African-American		Euro-American		t-test
	Means	Std Dev.	Means	Std Dev.	
Self-Report Cognitive Ability	20.49	3.53	22.96	3.05	-4.895*
Obtained Cognitive Ability Score	19.72	3.24	22.75	2.93	-6.164*
Stereotype Beliefs	14.14	3.83	13.77	4.29	.664
Collectivism 1	15.48	4.04	15.02	4.13	.828
Collectivism 2	17.50	3.81	16.87	3.71	1.252
Collectivism 3	9.56	2.57	9.48	2.53	.235
Collectivism 4	16.64	2.83	16.33	2.16	.887
Collectivism 5	11.96	2.50	11.69	2.26	.862
Verbal Self-Efficacy	17.32	4.09	15.59	3.73	3.249*
Math Self-Efficacy	15.62	5.73	14.18	4.67	2.023*
Verbal Performance	10.77	3.74	11.84	3.17	-2.265*
Math Performance	11.19	5.28	13.36	4.43	-3.275*

* $p < .05$

Table 4 - Scale Intercorrelations by Race

	1	2	3	4	5	6	7	8	9	10	11	12	13
Gender	-	.03	-.05	-.24*	-.07	.04	-.09	.08	-.13	-.03	-.33*	-.00	-.19*
Self-Report Cog. Ability	-.07	-	.97	.02	-.05	-.10	.01	-.01	.08	.40*	.27*	.55*	.59*
Obtained Cog. Ability	-.07	.86*	-	.10	-.07	-.13	-.01	.04	.12	.41*	.24*	.52*	.59*
Beliefs	-.08	.18	.17	-	.05	.14	.00	-.03	-.02	.19*	-.02	.19*	.10
Coll1	-.07	-.00	.01	.09	-	.42*	.27*	-.16	.23*	-.17*	-.17*	-.11	-.05
Coll2	.22*	-.09	-.06	-.02	.24*	-	.25*	-.04	.07	-.10	-.10	-.15	-.06
Coll3	-.07	-.11	-.02	.11	-.05	.07	-	.18*	.13	-.00	-.01	-.07	.00
Coll4	-.05	.13	.12	-.03	-.05	-.03	.18*	-	.18*	.03	.15	-.16	.04
Coll5	-.08	.03	.03	-.13	.05	.03	.18*	.26*	-	.08	.04	.01	-.01
Verb Self-efficacy	-.23*	.17	.16	.13	.02	-.13	.12	.11	.14	-	.11	.36*	.151
Mth Self-efficacy	-.25*	.08	.27*	-.07	.09	-.12	.15	.07	.07	.31*	-	.19*	.43
Verb Perf	-.10	.62*	.71*	.11	.14	-.03	.00	.10	-.05	.17*	.09	-	.41*
Math Perf	-.14	.34*	.59*	.06	.10	-.12	.07	.02	-.11	.05	.39	.29	-

Note: African Americans are below the diagonal and bold. Euro-Americans are above the diagonal. Gender was coded as Males = 1 and Females = 2. Coll1 stands for Collectivism factor 1 and the other factors are displayed in a similar fashion.

* $p < .05$

intercorrelations of the five factors and the reliabilities of measures of the five factors are presented in Table 2.

First, in order to assess order effects due to the stereotype beliefs measure, a hierarchical regression was computed. The stereotype beliefs scale was counterbalanced with some of the subjects completing the measure before the self-efficacy measures and some completing it afterwards. The dummy-coded variable, form, was entered into the equation after race. There was no main effect for order (form; $\Delta R^2 = .001$, $p > .05$). The race x form interaction was entered into the equation and also did not account for a significant portion of the variance ($\Delta R^2 = .007$, $p > .05$). Thus, the order in which the stereotype beliefs scale was presented did not affect levels of self-efficacy for cognitive ability tests.

Hypothesis 1 was not supported by a t-test analysis of subgroup mean differences in level of self-efficacy for cognitive ability tests. African Americans and White Americans did differ in level of self-efficacy; however, the difference was in the opposite direction of that predicted. African Americans reported having a higher sense of self-efficacy for verbal analogies than their White American counterparts ($t = 3.25$, $p < .05$). Similarly, African Americans reported a higher sense of self-efficacy for math knowledge items than White American subjects ($t = 2.04$, $p < .05$).

Hierarchical regression analyses were used to analyze the moderated relationship between race and self-efficacy as related to the individualism-collectivism factors (see Hypothesis 2). Race accounted for a significant portion of the variance in math knowledge test self-efficacy. This main effect reflects the earlier finding that African

Americans possess a higher level of self efficacy for the math knowledge test than their White American counterparts ($R^2 = .019$, $p < .05$). Although the demographic variable race did account for a significant portion of the variance in math knowledge test self-efficacy, there was no main effect for individualism-collectivism once entered into the equation after race ($\Delta R1^2 = .00057$, $p > .05$; $\Delta R2^2 = .01189$, $p > .05$; $\Delta R3^2 = .00715$, $p > .05$; $\Delta R4^2 = .00919$, $p > .05$; $\Delta R5^2 = .00350$, $p > .05$, for the five factors respectively). More specifically concerning the hypothesized relationship, the interaction between the five individualism-collectivism factors and race did not account for a significant portion of the variance in math self-efficacy ($\Delta R1^2 = .01479$, $p > .05$; $\Delta R2^2 = .00033$, $p > .05$; $\Delta R3^2 = .00722$, $p > .05$; $\Delta R4^2 = .00190$, $p > .05$; $\Delta R5^2 = .07277$, $p > .05$, respectively). The results of these analyses are presented in Table 5.

Similar to the results found for math knowledge test self-efficacy, there was a main effect for race ($R^2 = .04702$, $p < .05$) in verbal analogies test self-efficacy indicating that African Americans possess a higher sense of self-efficacy for the verbal analogies test than White American students. As before, the five individualism-collectivism factors did not account for a significant portion of the variance in self-efficacy for the verbal analogies test ($\Delta R1^2 = .00424$, $p > .05$; $\Delta R2^2 = .01318$, $p > .05$; $\Delta R3^2 = .00386$, $p > .05$; $\Delta R4^2 = .00614$, $p > .05$; $\Delta R5^2 = .01231$, $p > .05$, respectively). Contrary to the predicted relationship (Hypothesis 2), nonsignificant findings for the interactions were observed when self-efficacy for verbal analogies was regressed on race, the five factors of individualism-collectivism, and the five interactions between race and individualism-

Table 5 - Regression Analyses: Math Knowledge Test Self-Efficacy

	At Entry				ΔR^2	ΔF	p	Final Model			
	B	SE (B)	t	p				B	SE (B)	t	p
<u>Step 1</u> Race	-1.439	.711	-2.023	.044	.019	4.093	.044	3.353	2.748	1.220	.224
<u>Step 2</u> Collectivism 1	-.031	.088	-.354	.724	.001	.125	.724	.440	.274	1.603	.110
<u>Step 3</u> Race x Collectivism 1	-.315	.174	-1.810	.072	.015	3.277	.072	-.315	.174	-1.810	.072
<u>Step 1</u> Race	-1.439	.711	-2.023	.044	.019	4.093	.044	-2.414	3.338	-.723	.470
<u>Step 2</u> Collectivism 2	-.154	.095	-1.624	.106	.012	2.636	.106	-.229	.295	-.776	.438
<u>Step 3</u> Race x Collectivism 2	.051	.190	.269	.788	.000	.072	.788	.051	.190	.269	.788
<u>Step 1</u> Race	-1.439	.711	-2.023	.044	.019	4.093	.044	1.934	2.750	.703	.483
<u>Step 2</u> Collectivism 3	.175	.140	1.256	.210	.007	1.578	.210	.695	.434	1.601	.111
<u>Step 3</u> Race x Collectivism 3	-.353	.279	-1.264	.208	.007	1.597	.208	-.353	.279	-1.264	.208

Table 5 cont.

	At Entry				ΔR^2	ΔF	p	Final Model			
	B	SE (B)	t	p				B	SE (B)	t	p
<u>Step 1</u> Race	-1.439	.711	-2.023	.044	.019	4.093	.044	-4.523	4.909	-.921	.358
<u>Step 2</u> Collectivism 4	.201	.141	1.425	.155	.009	2.032	.155	-.058	.424	-.136	.892
<u>Step 3</u> Race x Collectivism 4	.191	.295	.648	.518	.002	.419	.518	.191	.295	.648	.518
<u>Step 1</u> Race	-1.439	.711	-2.023	.044	.019	4.093	.044	-1.439	.711	-2.023	.044
<u>Step 2</u> Collectivism 5	.131	.150	.877	.382	.003	.769	.382	.131	.150	.877	.382
<u>Step 3</u> Race x Collectivism 5	-.082	.303	-.270	.788	.000	.073	.788	-.082	.303	-.270	.788

Note: Collectivism 1-5 refer to the five factors of collectivism. Collectivism 1 is one's "personal independence and self-reliance." Collectivism 2 is "importance accorded to success." Collectivism 3 is the "value attached to working alone." Collectivism 4 is the "espousal of norms about the subordination of personal needs to group interests." Collectivism 5 is the "beliefs about the effects of personal pursuits on group productivity."

Table 6 - Regression Analyses: Verbal Analogies Test Self-Efficacy

	At Entry				ΔR^2	ΔF	p	Final Model			
	B	SE (B)	t	p				B	SE (B)	t	p
<u>Step 1</u> Race	-1.735	.534	-3.249	.001	.047	10.559	.001	.940	2.062	.456	.649
<u>Step 2</u> Collectivism 1	-.064	.065	-.976	.330	.004	.952	.330	.200	.206	.975	.331
<u>Step 3</u> Race x Collectivism 1	-.177	.131	-1.356	.177	.008	1.839	.177	-.177	.131	-1.356	.177
<u>Step 1</u> Race	-1.735	.534	-3.249	.001	.047	10.559	.001	-2.361	2.527	-.934	.351
<u>Step 2</u> Collectivism 2	-.123	.071	-1.728	.085	.013	2.987	.085	-.170	.221	-.771	.442
<u>Step 3</u> Race x Collectivism 2	.032	.144	.225	.882	.000	.051	.882	.032	.144	.225	.882
<u>Step 1</u> Race	-1.735	.534	-3.249	.001	.047	10.559	.001	.103	2.093	.049	.961
<u>Step 2</u> Collectivism 3	.098	.106	.931	.353	.004	.866	.353	.379	.327	1.158	.248
<u>Step 3</u> Race x Collectivism 3	-.192	.212	-.907	.366	.004	.822	.366	-.192	.212	-.907	.366

Table 6 cont.

	At Entry				ΔR^2	ΔF	p	Final Model			
	B	SE (B)	t	p				B	SE (B)	t	p
<u>Step 1</u> Race	-1.735	.534	-3.249	.001	.047	10.559	.001	.053	3.768	.014	.989
<u>Step 2</u> Collectivism 4	.126	.107	1.176	.241	.006	1.382	.241	.269	.322	.834	.405
<u>Step 3</u> Race x Collectivism 4	-.106	.226	-.470	.639	.001	.221	.639	-.106	.226	-.470	.639
<u>Step 1</u> Race	-1.735	.534	-3.249	.001	.047	10.559	.001	-.578	2.711	-.213	.831
<u>Step 2</u> Collectivism 5	.186	.111	1.669	.096	.012	2.787	.096	.320	.341	.937	.350
<u>Step 3</u> Race x Collectivism 5	-.094	.225	-.415	.678	.001	.173	.678	-.094	.225	-.415	.678

Note: Collectivism 1-5 refer to the five factors of collectivism. Collectivism 1 is one's "personal independence and self-reliance."

Collectivism 2 is "importance accorded to success." Collectivism 3 is the "value attached to working alone." Collectivism 4 is the "espousal of norms about the subordination of personal needs to group interests." Collectivism 5 is the "beliefs about the effects of personal pursuits on group productivity."

collectivism. None of the five interactions involving race and individualism-collectivism accounted for a significant portion of variance in verbal analogies self-efficacy ($\Delta R1^2 = .00816$, $p > .05$; $\Delta R2^2 = .00022$, $p > .05$; $\Delta R3^2 = .00366$, $p > .05$; $\Delta R4^2 = .00098$, $p > .05$; $\Delta R5^2 = .00077$, $p > .05$, respectively). The results of these regression analyses are displayed in Table 6.

The predicted relationship concerning beliefs about African Americans and their cognitive ability and its differential impact on self-efficacy depending on group membership and individualistic-collective orientation was not observed (Hypothesis 3). Self-efficacy was regressed on race, individualism-collectivism, beliefs about group, the three two-way interactions, and the three-way interaction. The three main effects were entered in the first block, followed by the three two-way interactions, and finally the three-way interaction was entered in block 3. The first block did not account for a significant ($p < .05$) portion of the variance in self-efficacy for math knowledge tests; however, some of the findings were marginally significant ($R1^2 = .02254$, $p = .1889$; $R2^2 = .03357$, $p = .0672$; $R3^2 = .02992$, $p = .0952$; $R4^2 = .03335$, $p = .0686$; $R5^2 = .02575$, $p = .1407$). Betas for the variables in block 1 indicate that there was a main effect for race, but not for beliefs about group or individual-collective orientation and this pattern was consistent across factors (see Table 7). Block two contained the three two-way interactions which also did not account for a significant portion of variance in self-efficacy for math knowledge tests ($\Delta R1^2 = .01937$, $p > .05$; $\Delta R2^2 = .00491$, $p > .05$; $\Delta R3^2 = .01126$, $p > .05$; $\Delta R4^2 = .01057$, $p > .05$; $\Delta R5^2 = .00430$, $p > .05$). The focal

Table 7 - Regression Analyses: Math Knowledge Test Self-Efficacy

	At Entry				ΔF	P	Final Model			
	B	SE (B)	t	p			B	SE (B)	t	p
Step 1 Race	-1.53	.73	-2.10	.037	.023	.189	-2.878	9.670	-.295	.768
Collectivism 1	-.02	.09	-.19	.850			-.169	1.028	-.164	.870
Group Beliefs	-.06	.09	-.70	.482			-.977	1.122	-.871	.385
Step 2 Race x Collectivism 1	-.347	.179	-1.944	.053	.016	.248	-.016	.630	-.026	.980
Race x Group Beliefs	.121	.182	.644	.507			-.472	.666	.709	.480
Coll 1 X Group Beliefs	.011	.021	.520	.604			.048	.070	.679	.498
Step 3 Race x Coll 1 x Beliefs	-.023	.043	-.549	.584	.001	.584	-.023	.043	-.549	.584
Step 1 Race	-1.597	.723	-2.210	.028	.034	.067	-10.864	12.092	-.898	.370
Collectivism 2	-.150	.096	-1.556	.121			-1.080	1.103	-.979	.329
Group Beliefs	-.056	.089	-.631	.529			-1.323	1.367	-.968	.334
Step 2 Race x Collectivism 2	.043	.194	.221	.826	.005	.789	.438	.699	.626	.532
Race x Group Beliefs	.129	.183	.705	.482			.612	.842	.728	.468
Coll 2 X Group Beliefs	.019	.024	.804	.422			.062	.077	.811	.418

Table 7 cont.

	At Entry				ΔR^2	ΔF	p	Final Model			
	B	SE(B)	t	p				B	SE(B)	t	p
<u>Step 3</u> Race x Coll 2 x Beliefs	-.028	.048	-.588	.557	.002	.346	.557	-.028	.048	-.588	.557
<u>Step 1</u> Race											
Collectivism 3	1.501	.722	-2.078	.039	.030	2.149	.095	1.610	10.587	.152	.879
Group Beliefs	.179	.140	1.275	.204				1.235	1.888	.654	.514
	-.070	.089	-.788	.432				.066	1.238	.053	.958
<u>Step 2</u> Race x Collectivism 3	-.407	.288	-1.410	.160	.011	.806	.492	-.482	1.087	-.444	.658
Race x Group Beliefs	.104	.180	.576	.566				.053	.724	.074	.941
Coll 3 X Group Beliefs	-.023	.036	-.655	.513				-.032	.126	-.254	.800
<u>Step 3</u> Race x Coll 3 x Beliefs	.005	.074	.072	.943	.000	.005	.943	.005	.074	.072	.943
<u>Step 1</u> Race											
Collectivism 4	-1.457	.722	-2.018	.045	.033	2.403	.069	-10.311	19.618	-.526	.600
Group Beliefs	.219	.142	1.540	.125				-1.205	1.937	-.622	.535
	-.060	.089	-.674	.501				-1.493	2.090	-.714	.476

Table 7 cont.

	AI Entry				ΔR^2	ΔF	p	Final Model			
	B	SE(B)	t	p				B	SE(B)	t	p
<u>Step 2</u>					.011	.759	.518				
Race x Collectivism 4	.193	.298	.648	.518				.453	1.206	.376	.708
Race x Group Beliefs	.107	.180	.595	.553				.391	1.291	.303	.762
Coll 4 X Group Beliefs	.052	.040	1.309	.192				.079	.128	.617	.538
<u>Step 3</u>											
Race x Coll 4 x Beliefs	-.018	.080	-.222	.824	.000	.049	.824	-.018	.080	-.222	.824
<u>Step 1</u>											
Race	-1.482	.725	-2.044	.0422	.026	1.841	.141	-7.380	14.146	-.522	.603
Collectivism 5	.129	.152	.851	.3956				-.977	1.84	-.531	.596
Group Beliefs	-.059	.090	-.653	.515				-1.027	1.380	-.744	.4576
<u>Step 2</u>											
Race x Collectivism 5	-.020	.311	-.065	.948	.004	.304	.822	.427	1.184	.361	.782
Race x Group Beliefs	.062	.182	.339	.735				.412	.913	.452	.652
Coll 5 X Group Beliefs	.032	.038	.841	.402				.075	.117	.644	.520
<u>Step 3</u>											
Race x Coll 5 x Beliefs	-.030	.077	-.392	.700	.001	.154	.700	-.030	.077	-.392	.696

relationship--the three-way interaction--did not account for a significant portion of the variance in self-efficacy suggesting the lack of the relationship referred to in Hypothesis 3 ($\Delta R1^2 = .00141$, $p > .05$; $\Delta R2^2 = .00162$, $p > .05$; $\Delta R3^2 = .00002$, $p > .05$; $\Delta R4^2 = .00023$, $p > .05$; $\Delta R5^2 = .00073$, $p > .05$). The results of these regression analyses are presented in Table 7.

As was done for self-efficacy for math knowledge tests, self-efficacy for the verbal analogies test was regressed on the three main effects in step 1, the three two-way interactions in step two, and the three-way interaction in step 3. Contrary to what was found for the self-efficacy for math knowledge tests, block 1--main effects of race, individualism-collectivism, and beliefs about group performance--did account for a significant portion of the variance in self-efficacy for verbal analogies ($R1^2 = .08275$, $p < .05$; $R2^2 = .08959$, $p < .05$; $R3^2 = .07792$, $p < .05$; $R4^2 = .08383$, $p < .05$; $R5^2 = .09081$, $p < .05$). The amount of variance accounted for by the individual variables was similar across the five factors. For the variables in block 1, there were main effects for race and beliefs about group performance consistently as shown by the betas in Table 8.

Individual-collective orientation did marginally ($p < .10$) impact reported level of self-efficacy for the verbal analogies test for two of the factors: block 12 (working alone) and block 15 (impact personal pursuits have on group productivity) as shown by the betas in Table 8. Next, the block containing the two-way interactions was entered. As with the math knowledge test self-efficacy, the two-way interactions did not account for a significant portion of the variance in self-efficacy for verbal analogies test ($\Delta R1^2 = .01900$, $p > .05$; $\Delta R2^2 = .00572$, $p > .05$; $\Delta R3^2 = .00651$, $p > .05$; $\Delta R4^2 = .00218$, $p >$

.05; $\Delta R5^2 = .00197$, $p > .05$). Similar nonsignificant findings for the three-way interaction were found for self-efficacy for verbal analogies as for self-efficacy for math knowledge items ($\Delta R1^2 = .00106$, $p > .05$; $\Delta R2^2 = .00116$, $p > .05$; $\Delta R3^2 = .00003$, $p > .05$; $\Delta R4^2 = .00828$, $p > .05$; $\Delta R5^2 = .00476$, $p > .05$, respectively). The results of these regressions for Hypothesis 3 are reported in Table 8.

The predicted relationship between self-efficacy and performance was evaluated while controlling for prior performance on a cognitive ability test. Subjects' self-reported standardized test scores (ACT and/or SAT) and, for most of the subjects ($n = 161$), ACT and/or SAT scores were obtained from the university the subjects were attending. Self-report scores of prior performance on cognitive ability tests and obtained scores on the tests were significantly correlated with each other ($r = .936$, $p < .05$). The intercorrelations of self-report cognitive ability test scores, obtained cognitive ability test scores, self-efficacy for each cognitive ability test, verbal analogies test performance, and math knowledge test performance are shown in Table 2. A partial correlation between self-efficacy and test performance, controlling for self-reported prior cognitive ability test performance, was computed in order to test Hypothesis 4. As predicted, a significant relationship between self-efficacy for verbal analogies and performance on the verbal analogies test was observed when controlling for self-report prior performance ($r_{\text{self-efficacy/test performance.self-report prior test performance}} = .1217$, $p < .05$). However, the relationship between self-efficacy for verbal analogies and performance on the verbal analogies test,

Table 7 - Regression Analyses: Verbal Analogies Test Self-Efficacy

	At Entry				ΔF	p	Final Model			
	B	SE(B)	t	p			B	SE(B)	t	p
<u>Step 1</u>										
Race	-1.819	.539	-3.377	.001	.083	.001	-3.156	7.252	-.435	.664
Collectivism 1	-.087	.066	-1.310	.192			-.512	.766	-.668	.505
Group Beliefs	.160	.067	2.380	.018			-.683	.831	-.822	.412
<u>Step 2</u>										
Race x Collectivism 1	-.184	.132	-1.393	.165	.019	.233	.036	.469	.076	.940
Race x Group Beliefs	.063	.136	.462	.645			.295	.494	.597	.551
Coll 1 X Group Beliefs	.025	.016	1.606	.110			.049	.052	.945	.346
<u>Step 3</u>										
Race x Coll 1 x Beliefs	-.015	.032	-.489	.625	.001	.239	-.015	.032	-.489	.625
<u>Step 1</u>										
Race	-1.835	.537	-3.420	.001	.090	.000	1.756	9.314	.188	.851
Collectivism 2	-.130	.072	-1.813	.071			-.013	.829	-.015	.988
Group Beliefs	.159	.067	2.379	.018			.195	1.025	.190	.850
<u>Step 2</u>										
Race x Collectivism 2	-.007	.145	-.045	.964	.006	.430	-.270	.536	-.504	.615
Race x Group Beliefs	.068	.137	.499	.618			-.252	.642	-.392	.695
Coll 2 X Group Beliefs	.020	.018	1.085	.279			-.008	.058	-.138	.891

Table 8 cont.

	At Entry				ΔF	P	Final Model			
	B	SE (B)	t	P			B	SE (B)	t	P
<u>Step 3</u> Race x Coll 2 x Beliefs	.019	.037	.511	.610	.261	.610	.019	.037	.511	.6101
<u>Step 1</u> Race										
Collectivism 3	-1.772	.539	-3.287	.001	.078	.001	-1.801	8.113	-.222	.825
Group Beliefs	.083	.106	.790	.431			-.189	1.417	-.134	.894
	.153	.067	2.262	.025			.224	.932	-.240	.810
<u>Step 2</u> Race x Collectivism 3										
Race x Group Beliefs	-.120	.216	-.555	.580	.484	.694	-.061	.827	-.073	.942
Coll 3 X Group Beliefs	.046	.136	.336	.737			.086	.552	.155	.877
	.025	.027	.918	.360			.032	.094	.336	.737
<u>Step 3</u> Race x Coll 3 x Beliefs										
	-.004	.056	-.075	.941	.006	.941	-.004	.056	-.075	.941
<u>Step 1</u> Race										
Collectivism 4	-1.736	.538	-3.225	.002	.084	.000	-20.964	16.037	-1.307	.193
Group Beliefs	.150	.107	1.401	.163			-1.460	1.547	-.944	.347
	.160	.067	2.383	.018			-1.804	1.666	-1.082	.2803

Table 8 cont.

	At Entry				ΔR^2	ΔF	p	Final Model			
	B	SE (B)	t	p				B	SE (B)	t	p
<u>Step 2</u>					.002	.163	.922				
Race x Collectivism 4	-.125	.228	-.550	.583				1.169	.977	1.197	.233
Race x Group Beliefs	.018	.137	.132	.895				1.420	1.038	1.368	.173
Coll 4 X Group Beliefs	-.012	.032	-.377	.707				.119	.101	1.175	.241
<u>Step 3</u>					.008	1.857	.175				
Race x Coll 4 x Beliefs	-.087	.064	-1.363	.175				-.087	.064	-1.363	.175
<u>Step 1</u>					.091	6.892	.000				
Race	-1.715	.536	-3.197	.002				10.075	10.405	.968	.334
Collectivism 5	.211	.112	1.888	.060				1.664	1.354	1.230	.220
Group Beliefs	.164	.067	2.443	.015				1.11	1.015	1.095	.275
<u>Step 2</u>					.002	.148	.931				
Race x Collectivism 5	-.147	.229	-.642	.521				-1.016	.871	-1.167	.245
Race x Group Beliefs	.007	.136	.050	.960				-.673	.671	-1.003	.317
Coll 5 X Group Beliefs	.002	.028	.054	.957				-.083	.086	-.960	.338
<u>Step 3</u>					.005	1.070	.302				
Race x Coll 5 x Beliefs	.058	.057	1.034	.302				.058	.057	1.304	.302

when controlling for obtained ACT scores, was not observed ($r_{\text{self-efficacy/test performance.prior test performance}} = .0918, p > .05$). Furthermore, a significant relationship was found between self-efficacy for math knowledge items and performance on the math knowledge items when controlling for self-report prior cognitive test performance ($r_{\text{self-efficacy/test performance.self-report prior test performance}} = .2665, p < .05$). Likewise, a similar relationship between self-efficacy for math knowledge tests and performance on the test when controlling for obtained past performance scores was significant ($r_{\text{self-efficacy/test performance.prior test performance}} = .25, p < .05$).

Hierarchical regression analyses were used to assess Hypothesis 5. Test performance was regressed on race, self-efficacy, and the product of race and self-efficacy. For math knowledge test performance, there was a main effect for race ($R^2 = .04751, p < .05$). Similarly, the amount of variance accounted for by self-efficacy for math knowledge tests was significant after race was entered into the equation ($\Delta R^2 = .15456, p < .05$). However, the focal relationship concerning the amount of variance in math knowledge test performance accounted for by the race x self-efficacy for math knowledge test interaction was not significant ($\Delta R^2 = .00078, p > .05$). The results of these regression analyses are also presented in Table 9.

There was a main effect for race on verbal analogies test performance ($R^2 = .02333, p < .05$), suggesting that Euro-Americans outperformed their African American counterparts. Likewise, self-efficacy for verbal analogies accounted for a significant portion of the variance in verbal analogies test performance after race was entered into the equation ($\Delta R^2 = .05983, p < .05$). Although there were main effects for race and self-

efficacy for the verbal analogies test, the prediction that differences in test performance scores between subgroups will be smaller at higher levels of self-efficacy for verbal analogies than the mean difference between the two subgroups at lower levels of self-efficacy for verbal analogies (Hypothesis 5) was unsupported by the data. The hierarchical regression analysis indicated that the race x self-efficacy interaction was not related to performance on the verbal analogies test after race and the test self-efficacy were entered into the regression ($\Delta R^2 = .00634$, $p > .05$). The results of these regression analyses are presented in Table 10.

Table 9 - Regression Analysis: Math Knowledge Test Performance

	At Entry				ΔR^2	ΔF	p	Final Model			
	B	SE (B)	t	p				B	SE (B)	t	p
<u>Step 1</u> Race	2.174	.664	3.275	.001	.048	10.723	.001	1.924	1.877	1.025	.306
<u>Step 2</u> Self-Efficacy	.375	.058	6.438	.000	.155	41.452	.000	.300	.176	1.700	.091
<u>Step 3</u> Race x Self-Efficacy	.055	.120	.456	.649	.001	.208	.649	.055	.120	.456	.649

Table 10 - Regression Analysis: Verbal Analogies Test Performance

	At Entry				ΔR^2	ΔF	p	Final Model			
	B	SE (B)	t	p				B	SE (B)	t	p
<u>Step 1</u>											
Race	1.025	.473	2.167	.031	.021	4.697	.031	-1.100	1.993	-.552	.582
<u>Step 2</u>											
Self-Efficacy	.216	.059	3.677	.000	.058	13.523	.000	-.003	.180	-.018	.986
<u>Step 3</u>											
Race x Self-Efficacy	.153	.119	1.291	.198	.007	1.667	.198	.153	.119	1.291	.198

Chapter 7

DISCUSSION

This study was conducted in an attempt to assess the possible contributions of self-efficacy--beliefs about one's capability--in accounting for differences between African Americans and Euro-Americans in cognitive ability test performance. For reasons, some suggested, most of the expected findings were not observed as discussed below. Potential explanations are offered for the observed findings.

The findings of the study suggest that African Americans possess a higher sense of self-efficacy for cognitive ability tests than Euro-Americans. Orientation toward the self or others did not influence one's belief in his or her ability to perform well on the cognitive ability tests. Likewise, stereotypical beliefs about African Americans' level of intelligence did not impact the self-efficacy of group members. As expected, however, one's belief in his or her ability was related to performance even when prior performance was taken into consideration. Finally, some of the difference in cognitive ability test performance between groups was not accounted for by the interaction of racial group membership and increasing level of self-efficacy.

Contrary to the expected relationship between self-efficacy for cognitive ability tests and subgroup status, African Americans reported a higher sense of self-efficacy for cognitive ability tests than their Euro-American counterparts. Potential explanations for this finding may include differences in general or overall perception of oneself--self-esteem--and its relationship to beliefs of capability in specific skill areas, and different reference groups African Americans and Euro-Americans use to assess their self-competence.

Research has shown that African Americans have a more positive self-perception than Euro-Americans. More specifically, contrary to predictions/expectations, African Americans possess a more positive assessment or evaluation of themselves in comparison to Euro-Americans (Turner & Turner, 1982; Tashakkori & Thompson, 1991). While self-esteem can be considered a general attitude or evaluation about the self based on many specific beliefs, self-efficacy has been defined as general or task-specific. General self-efficacy refers to a global confidence one has to successfully execute tasks; whereas, task-specific self-efficacy concerns beliefs about one's capability in performing a specific task (Bandura, 1977; Gist & Mitchell, 1992; and Stanley & Murphy, 1997). Research has found a strong relationship between general self-efficacy and self-esteem (Woodruff & Cashman, 1993; Schwarzer, 1993; and Saracoglu, Minden, & Wilchesky, 1989: as cited in Stanley & Murphy, 1997). Gist and Mitchell (1992) predicted that self-efficacy would be lower for individuals with low self-esteem compared to those with high self-esteem.

More recently, Stanley and Murphy (1997) attempted to determine: (1) the relationship between self-esteem and general self-efficacy, (2) whether self-esteem and general self-efficacy were distinct constructs, and (3) the relationship between general self-efficacy and task-specific self-efficacy. Findings suggest that self-esteem and general

self-efficacy are highly correlated which suggests that the two constructs are not distinct. Additionally, general self-efficacy was found to be related to task-specific self-efficacy. Thus, if African Americans do possess a more positive self-esteem than Euro-Americans and self-esteem is related to a general sense of competency which in turn is related to one's belief in his or her ability to perform well on a given task, then the finding that African Americans have a higher sense of self-efficacy for cognitive ability tests than Euro-Americans is not surprising.

The finding in this study contributes to current research regarding issues surrounding construals of self-esteem. Heiss and Owens (1972; see also Martinez & Dukes, 1987) proposed two types of self-esteem--public vs private domain--and investigated racial group differences in self-esteem depending on the domain. Heiss and Owens classified sense of self-worth or importance and intimate interactions or relationships with others in the private domain. They found that African Americans and Euro-Americans did not differ in regards to self-evaluations on private domain concerns. On the other hand, Heiss and Owens (1972) found that self-evaluations of African Americans were more negative than those of Euro-Americans for traits referenced by public (majority) standards such as those relevant to work-related competence and success, in addition to their ability, achievement, or intelligence (public domain). Consequently, research by Heiss and Owens (1972) would suggest that African Americans and Euro-Americans would differ in regards to self-efficacy for cognitive ability tests and that African Americans would report a lower sense of self-efficacy as found by Pajares and Kranzler (1995). However, as indicated, this finding was not observed in this study suggesting that perhaps the line between these two domains is not

as distinct as predicted for African Americans or simply the public domain for African Americans does not refer to the majority or public standards.

As previously suggested, African Americans and Euro-Americans may refer to different groups for comparison when attempting to construct one's evaluation of the self. White and Parham (1990) suggest that African Americans and Euro-Americans use different reference groups or standards for some of their self-evaluations. In particular, how an African American feels about himself/herself and what he/she is capable of doing is affected by individuals in their immediate surroundings (i.e., family, friends and others in African American community), not by the evaluations made by those of the majority or Euro-Americans, in particular (Rosenberg & Simmons, 1972; Rosenberg, 1979; Krause, 1983: as cited in Stanley & Murphy, 1997). If this is true, you would also expect African Americans in this study to have a high self-esteem because among their own group, they may be more superior (i.e., not as many African Americans go to college) than they are relative to the general population.

Thus, the observation that African Americans reflect a more positive belief in their capability than Euro-Americans may result from a more positive self-esteem in general and that African Americans are not affected by assumptions held by "nonsignificant" others and/or do not compare themselves to standards held by the majority.

This study also investigated differences in individual-collective orientation between African Americans and Euro-Americans and how these differences may impact the relationship between self-efficacy for cognitive ability tests and subgroup status. Once again, contrary to expectations, individual-collective orientation did not influence

the relationship between race and self-efficacy. As already discussed, subgroup status did influence level of self-efficacy for cognitive ability tests, but individual-collective orientation did not impact perceptions of capability. African Americans and Euro-Americans did not differ significantly in their orientation toward the self or others supporting some past research (Oyserman, et al, 1995).

According to Tajfel (1981: as cited in Arroyo & Zigler, 1995), a person's relationship with his or her social group is affected by how the group is evaluated. Arroyo and Zigler (1995) found that African Americans who believed that African Americans were viewed negatively lowered their identification with the social group. This maybe a factor of an attempt to protect self from group-based stereotypes (Oyserman, et al, 1995, stereotype vulnerability; Steele & Aronson, 1995, stereotype threat). More specifically, in the construction of one's identity, African Americans are engaged in both the process of building a positive sense of self and disavowing negative stereotypes concerning the group of which they are members. This attempt to discredit negative group perceptions may be manifested in low group identification.

Next, the focal relationship regarding the impact of beliefs about African Americans and their cognitive ability and its differential impact on self-efficacy depending on group membership and individual-collective orientation was addressed. This relationship may not have been observed for a number of reasons. First, there may be a difference between collectivism and group identification or ethnic pride. In particular, as research has suggested, one's collective or individual-orientation changes depending on the target individual. Thus, in order to ascertain the impact that beliefs have on self-efficacy for African Americans in relation to identification with the group, a

measure of ethnic pride or affiliation (Whittler, Calatone, & Young, 1994) may have been more explanatory. For example, those with low ethnic pride or affiliation with the group may not see stereotypes relating to the self and may not engage in protective behaviors; on the other hand, those with a high sense of ethnic identity may be more reactive to the statements, thereby protecting one's identity. Also, the greater one's racial self-esteem or ethnic pride, the more reactive African Americans may have been in their responses to belief statements. This finding may have resulted because as Arroyo and Zigler (1995) found, for African Americans, the greater the group identification, the lower the belief in group-based stereotypes held by the individual; thus fostering a reaction.

In regards to stereotype threat (Steele & Aronson, 1995) African Americans may not have responded to being aware of the stereotypes or believing them because agreement may have indicated confirmation of the stereotype beliefs. More specifically, African Americans who were aware of the cognitive ability assessment of the measure, such as in this study, were "the most avoidant of conforming to stereotype images of African Americans" (Steele & Aronson, 1995, p. 804). Also, with regard to stereotype vulnerability (Oyserman, et al, 1995), by denying awareness and belief of the stereotypes African Americans were protecting their sense of identity. African Americans could have been protecting their positive views of self and responding accordingly to questions about stereotypes (Oyserman, et al, 1995, stereotype vulnerability; Steele & Aronson, 1995, stereotype threat).

Finally, Euro-Americans did exhibit a relationship between beliefs about the "cognitive inferiority" of African Americans and verbal self-efficacy and verbal performance but this relationship was not evident for African Americans. For African

Americans, the stereotypes about "lack of intellectual ability" were not related to perceptions of ability. Arroyo and Zigler (1995) found that for African Americans, stereotypical beliefs were not related to perceptions of self-efficacy. This finding may have been observed because in order for the stereotypes to impact African Americans' perceptions of capability, they first had to be aware of the stereotypes, accept them and then believe that they pertain to them (Rosenberg, 1979). For the observed relationship for Euro-Americans, whether a person believes the stereotype to be true or not and whether he or she is a member of the targeted group or not, the biased information is still accessible and influential when making judgments or decisions about one's actions (Devine, 1989); thus the beliefs about the "cognitive inferiority" of African Americans may be related to Euro-Americans level of self-efficacy and subsequent performance on the verbal analogies test.

The predicted relationship between self-efficacy and performance was found further supporting current research findings (Locke, et al, 1984; Wood & Bandura, 1989; Zimmerman, et al (1992) and Pajares & Kranzler, 1995). Going a step further, controlling for prior performance, the relationship was still present. The more one believes in his or her ability to do something, the better he or she will perform even when taking prior performance on a similar task into consideration. However, self-report prior performance was related to perceptions of ability for Euro-Americans, but not for African Americans in some instances. This once again may be the lack of African Americans comparing themselves to Euro-Americans or the standards set by the public (Rosenberg & Simmons, 1972; Rosenberg, 1979; Krause, 1983).

In addition, although self-efficacy and performance were positively related, African Americans possessed a higher sense of self-efficacy; whereas, their Euro-American counterparts outperformed them. This finding may be reflecting research suggesting that overconfidence may be detrimental to performance or the overarching positive self-attributions and perceptions of African Americans. In particular, Zakay & Glicksohn (1992) found that overconfident individuals (e.g., those possessing an unrealistically high sense of self-efficacy for ability level) were more likely to make mistakes on multiple-choice tests, specifically. Confidence was positively related to performance, but overconfidence was found to be detrimental (Zakay & Glicksohn, 1992).

Finally, the lack of the predicted relationship between racial groups and increasing self-efficacy for cognitive ability tests may be explained by the overarching positive perceptions of oneself by African Americans across situations.

Conclusions

The central question addressed by this study was: "Does self-efficacy account for differences between African Americans and Euro-Americans in cognitive ability test performance?" Self-efficacy did not explain cognitive ability test performance differences between these two groups. African Americans reported a higher sense of self-efficacy which may be related to reports suggesting that African Americans possess a more positive perception of the self than Euro-Americans. This perception of self may be resilient to stereotypes held by the majority and perhaps the denial of stereotypes leads to overcorrection/overcompensation fostering a higher sense of self-efficacy, and subsequent overconfidence in ability. Furthermore, this overconfidence may have actually

contributed to the poorer performance by African Americans on the cognitive ability test. When examining the relationship between self-efficacy and performance on a complex decision task, Cervone and Wood (1995) found a negative relationship between one's belief in his or her ability to perform on the task and actual performance. Those who believed that they were highly competent "tended to overestimate their capabilities which resulted in marked discrepancies between expectations and attainment" (Wood, George-Falvy, Debowski, unpublished manuscript, p. 2)

Although a majority of the research previously presented existed before undertaking this study, this study does contribute to research. First, conflicting research exists concerning the "public" self-esteem of African Americans (i.e., African Americans have a higher sense of self-esteem than Euro-Americans and vice versa; see Peterson & Ramirez, 1971; Rosenberg & Simmons, 1972; Harris & Stokes, 1978; Porter & Washington, 1979; Osborne & LeGette, 1982; Wade, Thompson, Tashakkori, & Valente, 1989; Tashakkori, Thompson, Wade, & Valente, 1990; White & Parham, 1990). The line of research that suggested African Americans would display a lower sense of confidence in one's ability in regards to public standards (e.g., cognitive ability; Heiss & Owens, 1972; Martinez & Dukes, 1987) was used to generate the hypotheses tested in this study. However, the findings of this study appear to be more consistent with the research suggesting that African Americans may not employ the same references and standards when determining one's perception of oneself (see White & Parham, 1990). Thus, African Americans would not necessarily report lower perceptions of ability.

Also, conflicting research exists concerning whether self-esteem and self-efficacy are two distinct constructs. Once again, this study was based the line of research

suggesting that the two constructs were different (i.e., Hunt and Hunt (1977) reported that African Americans have a higher level of self-regard than Euro-Americans, but a lower sense of self-efficacy), however a relationship between the two does exist (Lorr & Wunderlich, 1986). For example, research conducted by Hughes and Demo (1989) suggests that self-efficacy is lower for African Americans, not self-esteem and that neither self-efficacy nor academic success are related to self-esteem for African Americans, as it is for Euro-Americans, perhaps due to different reference groups. Also, Lorr & Wunderlich (1986) suggest that self-efficacy is a subcomponent of self-esteem. In light of the findings of this study, for African Americans, one's perception of oneself and one's perception of his or her ability to perform a given task may not be as distinct as expected when conducting this investigation.

Limitations

In an attempt to recruit a sufficient number of African American participants, African Americans from other universities and minority programs were asked to participate in the study. A significant portion of the African American sample were participating in programs that had recognized or identified the students based on their academic performance and potential. Such recognition may have influenced their belief in their ability to perform well on the cognitive ability tests. As a result, African American student responses to the self-efficacy measure may have been affected.

While recruiting from other universities increased the sample size, this also resulted in an inability to obtain objective scores of prior cognitive ability test performance for these participants. Although the correlation between the obtained test scores and self-report scores for the remainder of the sample was high, the participants

could have falsely reported prior performance scores due to lack of accurate recall or bias. This is not likely, however, since the relationships between variables for obtained cognitive ability test score were the same for the same relations reported for the total sample and self-reported cognitive ability test score with only one exception.

Additionally, with the need for African American participants, the focused recruitment may have primed African Americans in regards a race factor. This heightened racial sensitivity may have influenced responses and performance.

In relation to the study design, the overt presentation of stereotype beliefs may have elicited reactive responses or demand characteristics from both African Americans in an attempt to protect self-identity or self-esteem and for Euro-Americans possibly in an attempt to avoid appearing racist in an acknowledgment of awareness of and belief in stereotypes. Further, for a race-based study, the race of the experimenter/researcher was consistent across sessions (i.e., African American researcher present for all sessions), potentially impacting student responses to stereotype statements whether by African Americans or Euro-Americans.

Also, collectivism was not assessed in regards to the specific target group, i.e., racial group membership. Research has shown that individual-collective orientation differs in relation to target person. Consequently, a more appropriate measure would have assessed orientation toward the individual's racial group (i.e., social identity; Tajfel, 1978) or, more specifically, the assessment of racial pride (Porter & Washington, 1979), collective self-esteem (Ethier & Deaux, 1990) or ethnic affiliation (Whittler, et al, 1994) may have been more appropriate for the hypothesized relationships for African Americans.

Future Research

Self-efficacy is influenced by past performance, modeling, and persuasion (Bandura, 1977; Gist & Mitchell, 1992). If African Americans have a higher level of self-efficacy than Euro-Americans and this was not related to past performance, such as found in this study for verbal self-efficacy, how does past performance relate to self-efficacy for African Americans? Additionally, the standards set by the majority or stereotypes held (verbal persuasion) may not impact level of self-efficacy for African Americans. Consequently, future research might explore the determinants of African Americans' task-specific self-efficacy. Perhaps, more importantly, do African Americans possess task-specific self-efficacies or do they perceive their ability to perform tasks in general as related to self-esteem? For example, there was a strong positive relationship between verbal and math self-efficacy for African Americans, but not for Euro-Americans.

In spite of the prevailing notion that African Americans are more collective; future research should investigate what is meant by this notion of collectivism and in regards to what targeted population. In what situations are African Americans more collective, and is this relationship moderated by the situation such that if negative stereotypes surround the situation then African Americans will not identify with the group? Also, what is the relationship between collectivism and ethnic pride, and is ethnic pride what African Americans possess more of in comparison to their Euro-American counterparts?

In addition, if African Americans do not make a distinction between the public and private domains as suggested, then the theories concerning the construals of self-

esteem may not be applicable to African Americans when stereotype threat or vulnerability becomes relevant. For example, although research hypothesizes that African Americans will possess a lower sense of self-esteem in regards to public domains, this does not take into account their attempt to disavow negative stereotypes which may manifest themselves in an "overcorrection" or more positive sense of self in the "public" domain for protective purposes.

Along those lines, does "overcorrection" in the development of self-esteem lead to a sense of "overconfidence" in ability? Thus, the relationship between overconfidence and self-esteem, self-efficacy in particular, should be investigated in African American groups.

In sum, belief in one's ability to perform well on cognitive ability tests did not explain the difference between African American and White American test performance. Future research should attempt to determine if these are true differences in ability or a function of test-taking motivating.

APPENDICES

APPENDIX A

Power Analysis

Effect sizes:

(Locke, et al (1984); Wood & Bandura (1989); Zimmerman, et al (1992);
& Pajares & Kranzler (1995))

self-efficacy and performance-- $r = .39-.64$, $p < .05$

(Oyserman, et al (1995)

collectivism-- $F(1, 102) = 3.69$, ($\underline{M}AA = 2.99$ vs. $\underline{M}EA = 2.78$), $p < .05$

individualism-- $F(1,102) = 1.46$, ($\underline{M}AA = 3.79$ vs. $\underline{M}EA = 3.66$), $p > .10$

(Pajares & Kranzler, 1995)

self-efficacy and race-- $r = .21$ (AA score lower), $p < .001$

self-efficacy and race--mean difference: $\underline{M}AA = 74.9$ vs. $\underline{M}EA = 83.2$, diff =

8.3, SD = 16.3, $t = -4.09$, $p < .0001$

(Arroyo & Zigler, 1995):

For African Americans:

stereotypical beliefs and self-efficacy-- $r = -.08$

stereotypical beliefs and identity-- $r = -.27$, $p < .05$

self-efficacy and identity-- $r = .24$, $p < .05$

For Euro-Americans (Arroyo & Zigler, 1995):

stereotypical beliefs and identity-- $r = -.12$

stereotypical beliefs and self-efficacy-- $r = -.12$

(Note: AA = African Americans and EA = Euro-Americans)

For hypothesis 1: Mean difference between African Americans and Euro-Americans will be analyzed and the expected effect size is moderate therefore requiring 64 African Americans and 64 Euro-Americans since the desired alpha level is .05 and the desired power = .80.

For hypotheses 2 & 5: The number of independent variables in the moderated regression are 3 and with an anticipated moderate effect size therefore requiring 76 African Americans and 76 Euro-Americans since the desired alpha level is .05 and the desired power = .80.

For hypotheses 3a & 3b: The number of independent variables in the moderated regression are 7 and with an anticipated moderate effect size therefore requiring 102 African Americans and 102 Euro-Americans since the desired alpha level is .05 and the desired power = .80.

For hypothesis 4: The anticipated effect size is a medium to large correlation therefore requiring between 28 and 85 subjects per group since the desired alpha level is .05 and the desired power = .80.

Consequently, in order to perform all necessary analyses with power = .80 and an alpha level = .05, the necessary sample size would be at least 204.

APPENDIX B

Demographic Questionnaire

Circle your responses or fill in your response in the appropriate blank.

Race

1 = African American

2 = White

3 = Other

Gender

1 = Male

2 = Female

Age _____

Year in College

1 = First-year

3 = Third Year

2 = Second Year

4 = Fourth Year

SAT score (Highest score possible 1600) _____

ACT score (Highest score possible 36) _____

gpa _____

APPENDIX C

Individualism-Collectivism Measure

**Mark the number on your answer sheet that most corresponds
to how much you agree with the statement.**

1	2	3	4	5
Strongly Disagree		Neutral		Strongly Agree

1. Only a person who depends on him/herself gets ahead in life
2. To be superior a person must stand alone
3. If you want something done right, you have to do it yourself
4. What happens to me is my own doing
5. In the long run the only person you can count on is yourself
6. Winning is everything
7. I feel that winning is important in both work and games
8. Success is the most important thing in life
9. It bothers me when other people perform better than me

**Mark the number on your answer sheet that most corresponds
to how much you agree with the statement.**

1	2	3	4	5
Strongly		Neutral		Strongly
Disagree				Agree

10. Doing your best isn't good enough; it is important to win
11. I prefer to work with the group rather than working alone
12. Given the choice, I would prefer a job where I could alone rather than in a group.
13. Working with a group is better than working alone
14. People should be made aware that if they are going to be part of a group then they are sometimes going to have to do things they don't want to do
15. People who belong to a group should realize that they're not always going to get what they personally want
16. People in a group should realize that they sometimes are going to have to make sacrifices for the sake of the group as a whole
17. People in a group should be willing to make sacrifices for the sake of the group's well-being
18. A group is more productive when its members do what they want to do rather than doing what the group wants them to do
19. A group is most efficient when its members do what they think is best rather than doing what the group wants them to do
20. A group is more productive when its members follow their own interests and concerns

APPENDIX D

Awareness of and Belief in Difference Items

**Mark the number on your answer sheet that most corresponds
to how much you agree with the statement.**

**1
Strongly
Disagree**

2

**3
Neutral**

4

**5
Strongly
Agree**

1. I am aware that African Americans score lower on intelligence tests than Caucasians.
2. I am aware that research has found Caucasians to score 15 points higher than African Americans on intelligence tests.
3. I have read reports that African Americans do not do as well as Caucasians on intelligence tests.
4. Caucasians are smarter than African Americans.
5. Caucasians do better on intelligence tests than African Americans.
6. African Americans possess less intellectual ability than Caucasians.

APPENDIX E

General Directions

Use the pencil provided to indicate your answer to each question on the answer sheet provided and use the scratch paper provided for any figuring you need to do. You should fill in one answer and only one answer. If you mark more than one answer for any question, you will receive no credit for that question. If you change your mind about the answer to a question, completely erase your first answer and fill in the letter for the other answer.

Example item:

A square has:

- a) two sides
- b) three sides
- c) four sides
- d) five sides
- e) six sides

The correct answer is "c." A square has four sides. Therefore, the answer "c" should be filled in.

Work as rapidly and accurately as you can. Do not spend too much time on any one question. If you finish a part of the test before time is called, you may check over your work.

You will not be penalized for guessing. If you are unsure of the answer to a question, select the response that you think is best.

APPENDIX F

Verbal Analogies

Directions: This test measures your ability to reason and see relationships between words. You are to choose the answer that best completes the analogy developed at the beginning of each question.

This test consists of 25 questions. Fill in the appropriate letter on your answer sheet. If you complete all the questions before the allotted time has elapsed, you may go back over this test.

DO NOT GO ON TO THE NEXT PAGE UNTIL YOU ARE TOLD TO DO SO

APPENDIX G

Air Force Officer Qualifying Test (AFOOT) Form O: verbal analogies subtest

The verbal analogies subtest measures your ability to reason and see relationships between words. There are a total of 25 questions.

Example item 1:

A word is to letter as zip code is to

- a) number*
- b) sign*
- c) symbol*
- d) address*

The answer is "a." A word is to letter as zip code is to number. Therefore, the letter "a" should be filled in.

Example item 2:

Applicant is to employee as

- a) customer is to salesperson*
- b) distributor is to competitor*
- c) pledge is to member*
- d) secretary is to engineer*

The answer is "c." An applicant is to employee as pledge is member. Therefore, the letter "c" should be filled in.

Example item 3:

Condemn is to praise as

- a) evaluate is to judgment*
- b) peripheral is to critical*
- c) success is to advantage*
- d) discern is to represent*

The answer is "d." Condemn is to praise as discern is to represent. Therefore, the letter "d" should be filled in.

Example item 4:

Purpose is to direction as

- a) stamina is to endurance*
- b) transition is to illustrate*
- c) efficiency is to quality*
- d) repetition is to achievement*

The answer is "a." Purpose is to direction as stamina is to endurance. Therefore, the letter "a" should be filled in.

Example item 5:

Company is to merger as

- a) auditor is to finance*
- b) monopoly is to takeover*
- c) person is to partnership*
- d) leader is to group*

The answer is letter "c." Company is to merger as person is to partnership. Therefore, the letter "c" should be filled in.

APPENDIX H

Self-Efficacy Measure for AFOOT Verbal Analogies Subtest

**Mark the number on your answer sheet that most corresponds
to how much you agree with the statement.**

1	2	3	4	5
Strongly Disagree		Neutral		Strongly Agree

1. I am confident that I will do well on the verbal analogies subtest.
2. I will earn one of the top scores on the verbal analogies subtest.
3. I believe that I will have no problems on the verbal analogies subtest.
4. Compared to other subjects, I will perform well on the verbal analogies subtest.

1	2	3	4	5
20%	40%	60%	80%	100%

5. What percentage of the 25 verbal analogy problems do you think you will answer correctly?

APPENDIX I

Math Knowledge

Directions: This test measures your ability to use learned mathematical relationships. Each problem is followed by five possible answers. Decide which one of the five answers is most nearly correct, and mark your answer on the separate answer sheet. Use the scratch paper provided for any figuring you need to do.

This test consists of 25 questions. Fill in the appropriate letter on your answer sheet. If you complete all the questions before the allotted time has elapsed, you may go back over this test.

DO NOT GO ON TO THE NEXT PAGE UNTIL YOU ARE TOLD TO DO SO

APPENDIX J

Air Force Officer Qualifying Test (AFOQT) Form O: math knowledge subtest

The math knowledge subtest measures your ability to use learned mathematical relationships. There are a total of 25 questions.

Example item 1:

If $a = b + 4$ and $b = 3a + 6$, then

- a) $a = -9$
- b) $a = 7$
- c) $a = 13$
- d) $a = -5$

The correct answer is "d." If $a = b + 4$ and $b = 3a + 6$, then $a = -5$. Therefore, letter "d" should be filled in.

Example item 2:

If $3x - 2 = 7$, then $4x =$

- a) 12
- b) 5
- c) $\frac{20}{5}$
- d) 9

The correct answer is "a." If $3x - 2 = 7$, then $4x = 12$. Therefore, the letter "a" should be filled in.

Example Item 3:

$$(19-18-17-16) - (20-19-18-17) =$$

- a) -36
- b) 2
- c) -4
- d) 1

The correct answer is letter "b." $(19-18-17-16) - (20-19-18-17) = 2$. Therefore, the letter "b" should be filled in.

Example Item 4:

Which one of the following is equal to $\frac{1}{4}$ of 0.01 percent?

- a) 0.000025
- b) 0.00025
- c) 0.0025
- d) 0.025

The correct answer is "a." One fourth of 0.01 percent = 0.000025. Therefore, the letter "a" should be filled in.

Example Item 5:

Which of the following is a solution to $x + x^2 = 1$?

- a) -1
- b) 1
- c) $\frac{1}{2}$
- d) None of the above

The correct answer is "d." The solution to $x + x^2 = 1$ is "none of the above." Therefore the letter "d" should be filled in.

APPENDIX K

Self-Efficacy Measure for AFOOT Math Knowledge Subtest

**Mark the number on your answer sheet that most corresponds
to how much you agree with the statement.**

1	2	3	4	5
Strongly Disagree		Neutral		Strongly Agree

1. I am confident that I will do well on the math knowledge subtest.
2. I will earn one of the top scores on the math knowledge subtest.
3. I believe that I will have no problems on the math knowledge subtest.
4. Compared to other subjects, I will perform well on the math knowledge subtest.

1	2	3	4	5
20%	40%	60%	80%	100%

5. What percentage of the 25 math knowledge problems do you think you will answer correctly?

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