THE RELATIONSHIP BETWEEN THE STRUCTURAL

DIMENSIONS OF SELF-EFFICACY SCALES

AND SEX ROLE ORIENTATION

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Tile of Study: THE RELATIONSHIP BETWEEN THE STRUCTURAL
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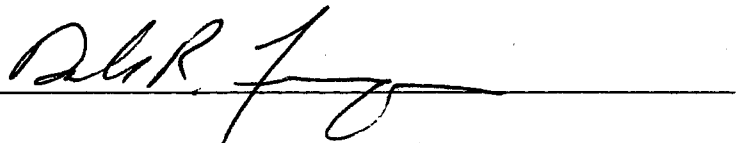Pages in Study: 173   Candidate for the Degree of
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Major Field: Applied Behavioral Studies

Scope and Method of Study: The major purpose of the study
    was to investigate the relationship between the
    structural dimensions of self-efficacy measures and sex
    role orientation. Participants (N = 651) in the study
    were undergraduate students enrolled in an introductory
    psychology course at a large midwestern university.
    Participants voluntarily completed the Multidimensional
    Self-Efficacy Scales (MSES), the Self-Efficacy Scale
    (SES), Bem Sex Role Inventory, Personal Attributes
    Questionnaire, and Demographic Information
    Questionnaire. Principal axis factor analysis with
    oblique rotation was first utilized to examine the
    structural dimensions of the MSES and the SES.
    Canonical correlation analyses and multiple regression
    analyses were, then, performed to explicate the
    relationships between the two constructs.

Findings and Conclusions: A nine-factor oblique solution for
    the MSES and a two-factor oblique solution for the
    SES were determined to best reflect the structural
    dimensions of the self-efficacy measures. Subsequent
    canonical correlation analyses indicated that there
    were statistically significant relationships between
    the self-efficacy measures and sex role measures
    (R_c=.72 with the MSES, R_c=.71 with the SES). The
    obtained regression equations further indicated that
    MSES factors representing masculine attributes, such as
    the self-assertive efficacy factor, were the most
    significant predictors of masculinity, whereas MSES
    factors representing feminine attributes, such as
    the meet others' expectation efficacy factor, were the
    most significant predictors of femininity.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

x

CHAPTER I

INTRODUCTION

Overview

Psychology's central problem is to predict human

behavior. The role of human behavior in the human

experience has become increasingly complex. The

determinants of human behavior thus become the major

interests of theorists. Bandura (1977a, 1977b)

recapitulated four major perspectives that theorize

differently the determinants of behavior. For example,

existentialists explain human behavior based on

unidirectional personal determinism. That is, internal

person variables are viewed as the determinants of behavior.

Behaviorists, on the other hand, explain human behavior

based on unidirectional environmental determinism. That is,

the environment is viewed as providing the determinants of

behavior. These two unidirectional models were the

fundamental perspectives in psychology (Bandura, 1977b)

during the early 20th century.

Later in the century, both unidirectional views were

incorporated into a bidirectional interactionism (Bandura,

1977b). Bidirectional interaction explains behavior as the

function of both the person and the environment. The major

1

difference that distinguishes this perspective from the
unidirectional perspectives is the acknowledgement of the
interaction between the person and the environment. This
perspective, however, retains unidirectional elements in
that it views behavior as the outcome of the interaction
between the person and the environment, but the
counterimpact of behavior on the person and the environment
is not reflected (Bandura, 1977b).

In the early 1950s, all three different perspectives
were incorporated into a triadic reciprocal determinism. In
this perspective, all three elements (person, environment,
and behavior) interact with each other in a reciprocal
motion, thus affecting each other. Bandura (1977a) expanded
social learning theory based on this triadic model.
Theoretically, every element (person, environment, or
behavior) is an important determinant of the remaining two
elements in the triadic model. However, the personal
elements represented by the "self-system" play the central
role in this triadic model in social learning theory.

The self-system refers to "cognitive structures that
provide reference mechanisms and to a set of subfunctions
for the perception, evaluation, and regulation of behavior"
(Bandura, 1978, p.348). This self-system is the construct
that actively mediates the reciprocal interactions among the
person, the environment, and the behavior. In other words,
an individual acts upon the environment, then cognitively

evaluates the processes and the results of the interaction between self and the environment. If necessary, some modifications are made based on self-produced influences, which in turn affect subsequent behavior. Once behavior is exhibited, then, the person assesses the behavior, which in turn affects the environment. Therefore, according to social learning theory, a large portion of behavior can be explained by the self-system.

One of the major cognitive structures emphasized in the self-system is the self-regulatory system (Bandura, 1977a, 1977b, 1982). Throughout the interactional process, the self-system activates cognitive structures that evaluate each component of the process and produce self-generated influences over the process. However, the self-regulatory system is not an automatic system; therefore, it has to be activated to regulate behavior. Self-efficacy is another significant cognitive structure in the self-system. Self-efficacy is defined as "people's beliefs about their capabilities to produce designated levels of performance that exercises influence over events that affect their lives" (Bandura, 1994, p. 71).

In recent years self-efficacy has received substantial attention from researchers. Self-efficacy is defined as a conviction that one can get things done to produce desired outcomes. It has repeatedly been shown that self-efficacy mediates behavior through the self-regulatory system (e.g.,

Bandura, 1977a, 1982; Lopez & Lent, 1992). One of the major issues addressed by Bandura (1982, 1986) in self-efficacy research concerns the measurement of the construct. He emphasizes the importance of accurate measurement of self-efficacy so that the predictive power of self-efficacy on performance can be examined. In order to achieve this, he proposes the following three major dimensions of the self-efficacy construct need to be measured: magnitude, strength, and generality.

One major instrument used to measure self-efficacy was developed by Bandura (1989) himself; the Multidimensional Self-Efficacy Scales (MSES). He proposed several more specific dimensions of self-efficacy in developing the MSES. The nine dimensional structure of the MSES was partially supported by a recent validation study conducted by Williams, Coombs, and Fuqua (1996), in which nine primary factors retained were somewhat similar to the nine dimensions proposed by Bandura (1989). However, the nine factors in that study were substantially correlated, which raises questions regarding the validity of the proposed dimensions of the MSES.

More recently, the existence of general self-efficacy has been also proposed by Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, and Rogers (1982). They developed a two-dimensional general self-efficacy scale with general and social dimensions. Although the authors provided evidence

of validity, further validation studies seem to be needed.

Numerous studies have examined the relationships between self-efficacy and other psychological constructs. For example, self-esteem has been examined in relation to self-efficacy by several researchers (e.g., Sherer, Maddus, Mercandante, Prentice-Dunn, Jacobs, & Rogers, 1982; Woodruff & Cashman, 1993). Other examples include depression (e.g., Ehrenberg, Cox, & Koopman, 1991; Kanfer & Zeiss, 1983) and test anxiety (e.g., Shelton & Mallinckrodt, 1991).

Gender has traditionally been used as a demographic variable in many studies. Behavioral differences in some areas were explained by way of biological gender difference. However, the magnitude of gender effects on behavior is not great (Deaux, 1984). Therefore, the limitation of gender as a demographic variable prompted researchers to examine sex as a psychological variable. When gender was viewed as a psychological variable, gender served as a continuous variable, not as a discrete variable. Consequently, two independent personality traits emerged from sex as a psychological variable, femininity and masculinity.

In the early 1970s several researchers developed scales that measure masculinity and femininity (Deaux, 1984). The most widely used instrument was the Bem Sex Role Inventory (BSRI, Bem, 1974). The theoretical background of the BSRI development was based on the gender schema theory. Gender schema is a cognitive structure that processes and organizes

the world in terms of gender. Thus, a person is sex-typed if the world is interpreted based on one's gender. A person is non sex-typed if one does not see the world through one's gender. In America a sex-typed woman is one who is cooperative, yielding, and dependent because these traits are viewed as social standards of sex role for a female (Bem, 1981b). In contrast, a sex-typed male is one who is competitive, aggressive, and independent in America because these are expected traits for a male by American society (Bem, 1981b).

Spence (1975) also developed the Personal Attributes Questionnaire (PAQ) to measure sex role orientation. This scale was developed based on the gender identity theory. In gender identity theory gender-related attributes are viewed as multifaceted, thus Spence (1975) asserts that the PAQ measures narrow traits such as instrumentality and expressiveness, instead of femininity and masculinity.

There have been debates over what each instrument actually measures. The results of the debates are inconclusive. However, in many empirical studies, similar patterns in correlations were found for both Bem's and Spence's instruments. Overall, there are strong correlations between the two measures, thus indicating that they may measure the same constructs.

Sex role orientation is another construct that is believed to be related to self-efficacy. However, only a

few studies reported in the literature examined the relationship of sex role orientation and self-efficacy. The few studies that have been reported specifically looked at the relationship between domain specific self-efficacy and sex role orientation. For example, two studies (Matsui & Onglatco, 1991; Matsui, 1994)) examined the relationship between sex role orientation and task specific self-efficacy in occupations. In light of the very limited evidence regarding these relationships further research regarding them seems warranted.

<div align="center">Statement of the Problem</div>

A considerable amount of empirical evidence of the effects of self-efficacy on learning has been provided. Numerous measures of self-efficacy have been reported in the literature. However, one instrument measuring specific self-efficacy that deserves attention is the MSES. Yet, not enough knowledge of the psychometric properties of the MSES are currently available. Also no studies to date have been conducted to validate Bandura's multidimensional self-efficacy scales using a college population (prior studies have relied on high school samples). Thus, there is a need for further validation of the same scale using different populations. There is some conflicting evidence to suggest that the number of dimensions Bandura (1989) proposed for self-efficacy do not actually exist in the instrument (e.g., Williams et al., 1996; Sherer, Maddus, Mercandante,

Prentice-Dunn, Jacobs, & Rogers, 1982). Given the central role of self-efficacy in social learning theory, its dimensionality is a central issue. In addition, how the specific self-efficacy relates to general self-efficacy is an important issue that has not yet been adequately addressed.

By and large the relationship of self-efficacy to sex role orientation has not been satisfactorily addressed. This is rather surprising given the large number of variables that have been shown to relate sex role orientation and to self-efficacy when they are studied individually. Therefore, this study has been designed to contribute to the continuing examination of the structure of self-efficacy and equally importantly to relate self-efficacy structure to measures of sex role orientation.

<div align="center">Research Questions</div>

The research study being reported addresses four related research questions. These questions are listed as follows:

1. What are the structural dimensions of the Multidimensional Self-Efficacy Scales with a college population?

2. What are the structural dimensions of the generalized Self-Efficacy Scales with a college population?

3. How does a multidimensional self-efficacy scale relate to a generalized self-efficacy scale?

4. What are the relationships between the dimensions of
    self-efficacy and dimensions of sex role orientation?

Significance

It has been noted that American society reflects a male
dominated culture where the societal structure and
atmosphere implicitly imposes desirable male traits for both
genders. Self-efficacy is a central theoretical construct
in social learning theory that has received increasing
emphasis in the research literature. The importance of
self-efficacy as psychological construct alone would merit
significant scientific attention. The nature of self-
efficacy, including its goal-oriented and achievement-
oriented nature, appears to have features that may be more
relevant to masculine characteristics. The underaddressed
and potentially important relationship of self-efficacy to
gender role characteristics further emphasizes the social
and scientific significance of this inquiry.

Limitations

Two major limitations are anticipated in the design of
the study. The reliability and validity of the measures of
self-efficacy and sex role orientation are major limiting
factors. The study sample, college students, was selected
to extend previous results with high school samples.
However, the nature of the sample employed imposes
limitations on the study as well.

Definitions of Terms

For purposes of this study, the following definitions of terms were used;

Self-System

Bandura defined the self-system as "cognitive structures that provide reference mechanisms and to a set of subfunctions for the perception, evaluation, and regulation of behavior" (Bandura, 1978, p.348). This definition has been adopted for this study.

Self-Regulation

Self-regulation refers to a cognitive structure in which the major functions include self-regulation through internal standards and self-evaluative reactions to one's own behavior. Self-regulation operates through three subfunctions, self-observation, judgmental process, and self-reactive influence to produce self-produced influence over behavior.

Self-Efficacy

Self-efficacy refers to a belief that one can activate the self-regulatory system to bring desired behavioral outcomes. Self-efficacy has an operating function within self-system, thus the construct deals with people's perception of their own generative capabilities.

Sex role orientation

Sex role orientation refers to self-perceptions of the degree of masculinity and femininity in a person.

Masculinity refers to the extent to which an individual possesses those characteristics traditionally associated with men. These characteristics include independence, competitiveness, aggressiveness, and self-sufficiency. Femininity refers to the extent to which an individual possesses those characteristics traditionally associated with women. These characteristics include, dependence, acquiescence, compassion, and tenderness.

CHAPTER II

REVIEW OF LITERATURE

The current study was designed to examine the structural dimensions of two self-efficacy measures: Multidimensional Self-Efficacy Scales (MSES, Bandura, 1989) and Self-Efficacy Scale (SES, Sherer, Maddus, Mercandante, Prentice-Dunn, Jacobs, & Rogers, 1982). A related second purpose was to examine the relationship between the dimensions of each self-efficacy measure and sex role orientation measures. The first section is a review of social learning theory and important constructs in social learning theory. Those constructs include observational learning, self-system, self-regulation, and self-efficacy. The measurement of self-efficacy is reviewed as a separate section due to its centrality for this study. The second section is a review of the sex role orientation literature, which includes Bem's (1974) model, Spence's (1975) model, and the relation between the two different models. In the third section, variables related to self-efficacy and variables related to sex role orientation are presented. Finally, in the fourth section, the specific relationship between self-efficacy and sex role orientation is discussed.

Social Learning Theory

Overview

Throughout history, theorists have tried to explain what determines human behavior. Whether the determinants of human behavior are internal person variables or environmental variables depends on the perspective theorists adopt. Four different perspectives are discussed.

The first perspective is unidirectional environmental determinism which postulates environment as the major determinant of human behavior (E->B) (Bandura, 1978). Behaviorists, who support this position, discredit the influence of personal factors on behavior (McAdams, 1990). Some behaviorists acknowledge a mediational role for the organism between the environmental stimulus and these behavioral responses (E->O->B) to a certain degree. In other words, the environment may stimulate a response from the organism (O), which may modify the organism's behavior. However, Bandura (1978) argues even this moderate view obviates human reactions to the environment, and the environment continues to be viewed as the major determinant of the behavior.

The second perspective is unidirectional personal determinism which specifies internal person variables as the major determinants of behavior (P->B). Within unidirectional personal determinism, the central theme is a subjective environment created by the individual, implying

that the individual's environment results from the person variables. Thus, existentialists support this type of model (McAdams, 1990). The problem with this view is that it does not acknowledge environmental influences on the individual's perceptions, thereby neglecting the impact of the environment on the individual (Bandura, 1978).

The third viewpoint is bidirectional interactionism, which consolidates the two unidirectional approaches. Bidirectional interactionism views behavior as the outcome of the interaction between the person and the environment $[B=f(P,E)]$. This view of interaction is bidirectional because it presumes that both person and environment influence behavior. In essence however, this view still retains unidirectional elements in that it fails to consider the counterinfluence of behavior on person and environment (Bandura, 1978).

The last perspective is triadic reciprocal determinism. This position consolidates both unidirectional and bidirectional determinism (Bandura, 1978). Yet this view surpasses a simple addition of the unidirectional and bidirectional approaches since behavior is not viewed as an end product. In this approach behavior is viewed as an equal element in continuous reciprocal interaction among person, environment, and behavior variables. The following Figure 1 illustrates these relationships (Bandura, 1982, p.4)
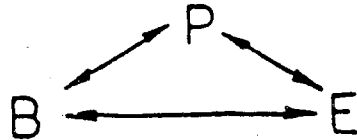
Behavior and environment interact with each other, which influences person variables; behavior and person variables interact with each other, which influences environment; person variables and environment interact with each other, which influences behavior. Consequently, in this triadic model, behavior can be a stimulus, a response, or an environmental reinforcement because of the circular reciprocal interaction. In the triadic interactional process, the predominance of each component as a determinant varies across the individual and the situation.

Bandura (1977b) speculated,

Though the potential environment is identical for all animals, *the actual environment depends upon their behavior*. Is the animal controlling the environment or is the environment controlling the animal? What we have here is a two-way regulatory system in which the organism appears either as an object or an agent of control, depending upon which side of the reciprocal process one chooses to examine (p.196).

How a person acts upon the environment, therefore, becomes the central theme in social learning theory. Within this

triadic theoretical framework, it is hypothesized that people learn through experiencing the actual environment and/or by observing the consequences which are the results of actions. Direct experiences, however, can be expensive and risky (1977b, Bandura). An alternative to direct experiential learning is learning through observation.

Observational learning

Through observing a model people can learn without the risk of serious consequences that may occur with direct experience. A model is defined as "anything that conveys information to an observer" (Hergenhahn, 1988. p.348). A model can be direct or abstract, such as a person, television, a newspaper, or an instruction (Herganhahn, 1988). In social learning theory learning through modeling plays an important role. For example, sex role learning is mainly achieved through observing performance and its consequences on others (Bandura, 1986; Mischel, 1970). Children observe the behavior of both males and females and selectively learn sex-appropriate behavior. However, mere presentation of a model does not induce learning. According to Bandura (1986), observational learning occurs by way of four component processes. Those component processes include 'attentional processes', 'retentional processes', 'behavior reproductive processes', and 'motivational processes' (Bandura, 1986, p.51). Each component process is discussed as follows.

Attentional processes. This is the first step in observational learning. People learn only when people pay attention to a model, but the observer's attention is selective. Some factors that influence selectivity include characteristics of the observer, characteristics of the observed, functional value of modeled behavior, and attractiveness of the observed (Bandura, 1977).

Retentional processes. Retentional processes reserve information obtained by attentional processes. What has been learned by observation can be stored in two symbolic ways: visually and verbally. The verbal symbolic retention is more important in Bandura's theory because, according to Bandura (1977b), verbal symbols store more information more easily. This human capacity for symbolic retention is what allows people to learn from observations (Bandura, 1977b). He believes that once the observational learning is cognitively stored, people can retrieve it, practice it, or reinforce it.

Behavioral reproductive processes. Not all that has been learned can be transformed immediately into performance. "A period of cognitive rehearsal" (Hergenhahn, 1988) is required so that the learner can match performance to the model's performance. These processes are what Bandura calls behavior reproduction processes. During this cognitive rehearsal process, a person observes a potential behavior and compares it to the modeled behavior that is

symbolically stored in the cognitive reservoir. If there is any discrepancy between the potential behavior and the modeled behavior, the person may modify the intended behavior.

Motivational processes. Observational learning is not transformed into actual behavior until there is an incentive for doing so (Bandura, 1986). A person has to be motivated to produce behavior. In motivational processes, several factors influence the person's behavior. One is the expected environmental consequences of the behavior, which are cognitively and symbolically stored in the person's memory. Another factor is the person's anticipated self-reactions to the anticipated behavior. These anticipated reactions are regulated by internalized standards. Environmental consequences reflect the influence of the environment, whereas the anticipated self-reactions reflect the influence of person variables on behavior. Thus, one pattern of the triadic interactions, more specifically the combined effects of environment and person on behavior, is clearly reflected in the motivational process.

Theoretically speaking, each element in the triadic model is important in social learning (Bandura, 1986). Nevertheless, a considerable amount of emphasis seems to be placed on person factors within the reciprocal interaction because Bandura (1986) believes that most behavior is the result of a person's self-produced influences. The self-

system is the structural system that enables a person to generate self-produced influence on behavior.

Self-System

In the triadic reciprocal deterministic model, a person is neither completely independent of the environment, nor completely dependent on the environment. Which influence is dominant depends on the specificity of circumstances and the individual. The actual influence of the individual in influencing and being influenced by the environment or even one's own behavior is a result of the internal "self-system" discussed by Bandura (1986).

The self-system, representing person elements in the model, refers to "cognitive structures that provide reference mechanisms and to a set of subfunctions for the perception, evaluation, and regulation of behavior" (Bandura, 1978, p.348). The two component cognitive structures in the self-system that have received most attention are self-regulation and self-efficacy. Self-regulation primarily deals with self-regulation of behavior through internal standards and self-evaluative reactions to a person's own behavior. Self-efficacy deals with people's perception of their own generative capabilities.

Self-Regulation

Bandura (1978) believes that the self-regulatory function of the self-system is that which enables self-directive behavior of a person. It should be noted that

self-regulation is different from willpower or intention
because behavior can be reinforced extrinsically as well as
intrinsically. Bandura (1982) places more emphasis on
intrinsic reinforcement. Intrinsic reinforcement, one of
the factors that contributes to operating self-regulatory
function of self-system, employs three subfunctions
(Bandura, 1982). These functions are summarized as follows.

Self-observation. A person has to observe behavior to
control their actions. The person pays discriminating
attention to different things depending on the "value
orientation and the functional significance of given
activities" (Bandura, 1982, p.6). Different things could be
selectively attended to including environment, situations,
one's own behavior, or others' behavior. This self-
observation is the first step in regulating one's behavior.

Judgmental process. Self-observation alone does not
trigger self-reactions that would bring behavioral change.
Judgmental processes are the mechanisms that are required to
initiate self-reactions that result in behavioral change.
There are four subprocesses in the process of judgement to
regulate one's actions. Those are personal standards,
referential performance, evaluation of activities, and
performance attribution.

The first component, personal standards, is developed
to evaluate actions. When developing one's standards,
sources such as modeling and/or teaching contribute to the

criterion establishment. Stated differently, a person develops one's evaluation system by observing and learning from others. Once the evaluation system is well established, a person uses that criteria to evaluate behavior. This personal standard, however, does not permit a person to see one's relative accomplishment in terms of performance; one needs to refer to external criteria.

The second component is referential performance. Depending on the activities or tasks, a person usually chooses reference groups with whom the person shares common characteristics. For example, a student may appraise one's academic performance against classmates, or an employee may evaluate work performance against co-workers' performance.

The third component is evaluation of activities. A person makes an effort to do a good job when the potential activities are perceived as meaningful. Thus, a person is likely to engage in action that is considered to be meaningful.

The last judgmental component is performance attribution. How a person attributes performances, whether to self or to environment, also influences one's judgmental processes. Satisfaction and self-worth are attained when a person attributes satisfactory performance to effort or ability. If a person sees external factors such as luck contributing to success, performance may not be evaluated as satisfactory. If failure is attributed to a lack of effort

or low ability, performance may be evaluated as
unsatisfactory.

Self-reactive influence. Once a person has developed
judgmental standards and judgmental skills, one might be
able to produce self-generated influence over behavior.
This could be attained by self-produced incentives or by
foreseeing consequences of action. Self-produced incentives
influence behavior primarily through motivation because a
self-motivated person will exert effort to accomplish goals.
However, if foreseen consequences are considered to be
negative, then a person is not likely to take action
(Bandura, 1982). In social learning theory, this self-
reactive influence plays the major role in generating self-
produced influence, which interdependently interacts with
both behavior and environment.

In addition to the intrinsic reinforcement, according
to Bandura (1982), extrinsic reinforcement also contributes
to the operation of a self-regulatory system. Some selected
examples include personal benefits, social rewards, modeling
supports, and negative sanctions. These are summarized as
follows.

Personal benefits. The benefits a person achieves by
operating the self-regulatory system can be extrinsic and/or
intrinsic. A person may regulate behavior to achieve a goal
using self-incentives without external incentives. That
enhances the person's competence, which is an intrinsic

benefit. There also can be additional extrinsic benefits that a person can achieve from self-regulatory behavior, such as passing a course by completing required assignments in the course (Bandura, 1986).

Social reward. A society also promotes high standards by encouragement, reward, and social recognition although receiving social award does not necessarily reflect adherence to high standards. For instance, an adolescent female might regulate her behavior to be feminine, which may be encouraged or rewarded by her parents or teachers. However, feminine behavior does not indicate that the adolescent female regulated her behavior based on high standards. She may have replaced her personal standards with socially desirable standards.

Modeling supports. Modeling is an important external support for maintaining a sense of personal standards by observing others regulating their behavior. One example of behavior that can be learned through modeling is sex-typing (Mischel, 1970). According to Mischel (1970), a person develops sex role orientation mainly through observing others' behavior. Thus, a person can also acquire certain behavior by observing models without direct or external reinforcement (Bandura, 1977b).

Negative sanctions. Social sanctions as well as personal sanctions help maintain a person's internal standard. People try to avoid aversive social consequences

or self-criticism by adhering to high standards. For example, a man may not have a strong desire to exhibit assertive and competitive behavior which are considered desirable male traits. However, he may regulate his behavior to conform to the social standards for males, so that he can avoid criticism from society and/or personal criticism.

One interesting aspect of the self-regulatory system is that it is not an automatic system, and has to be activated to operate. However, Bandura (1982) contends that people can selectively engage or disengage the system when they have reasons for doing so, which leads to meaningful social implications. People may disengage the system when facing situations that challenge "religious principles, righteous ideologies, and nationalistic imperatives" (Bandura, 1982, p.18). People may also disengage their regulatory system by rationalizing objectionable behavior to avoid self-criticism. Or people may make a selective comparison by choosing a different reference group with which to compare substandard behavior, thereby making their behavior appear to be more acceptable. People may ignore the system in many situations to avoid negative self-evaluation that would be generated if the self-regulatory system is engaged.

<u>Self-Efficacy</u>

<u>Theory</u>

According to Bandura (1986), knowledge, skill, or self-

regulatory capabilities are important elements in performance. However, he maintains, they do not necessarily bring optimal performance. A central construct in social learning theory that connects knowledge to optimal performance is perceived self-efficacy (Bandura, 1986). Perceived self-efficacy refers to "people's judgements of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). This perceived self-efficacy is one facet of the self-system that directs human behavior by influencing psychological functioning in terms of choice of actions, amount of effort invested in performance, duration of performance, thought patterns, and emotional reactions (Bandura, 1982).

The significant relationship between self-efficacy and performance has been repeatedly supported by numerous empirical studies in many behavioral domains. For example, significant results were found in which the relation of self-efficacy to motor-performance was examined (Weinberg, Gould, & Jackson, 1979). Under differently manipulated self-efficacy conditions performance was measured by requiring 60 college students to extend and maintain one leg in a horizontal position as long as possible. The authors' hypothesis that students with high self-efficacy would maintain the position longer than their counterparts was supported. Many empirical studies in other task specific

areas have also provided evidence of a strong relationship
between self-efficacy and respective performance tasks.
Some examples include math self-efficacy (e.g., Hackett &
Betz, 1989; Lopez & Lent, 1992), career self-efficacy (e.g.,
Matsui, 1994), and academic self-efficacy (e.g., Schoen &
Winocew, 1988).

One area of research that accompanied the establishment
of the relationship between self-efficacy and performance
deals with the origins of self-efficacy. Several studies
have been conducted to examine four different sources of
self-efficacy that were proposed by Bandura (1977a, 1977b,
1982): performance accomplishments, vicarious experience,
verbal persuasion, and emotional arousal. Of the four
sources, more research has been focused on performance
accomplishments and vicarious experience than verbal
persuasion and emotional arousal. Each source is briefly
explained and accompanied by empirical studies in which the
relationships between each source and performance were
explored.

Performance accomplishments. Self-efficacy can be
attained through actual performance. A series of successes,
in general, is believed to increase levels of self-efficacy.
A series of failures, on the other hand, is believed to
decrease the levels. When one achieves a series of
successes or failures, those experiences (past performance)
become the major determinant of self-efficacy. Then, the

perceived self-efficacy in turn acts as a better predictor of future performance than the past performance.

In a causal study in which the relationship between self-efficacy and performance was examined, Bandura, Reese, & Adams (1982) categorized the levels of self-efficacy at three different levels; low, medium, and high. The subjects in each efficacy condition were then asked to perform several tasks in increasing order of difficulty. The results showed that success at an earlier task increased subjects' self-efficacy level significantly, and the performance of consecutive task was positively affected. The trend was the same across the group and across subjects in each group. In another more recent study performance accomplishment was examined as a source of math self-efficacy (Lopez & Lent, 1992). Lopez and Lent (1992) used the Sources of Math Efficacy Scale (Lent, Lopez, & Bieschke, 1991) to measure four different sources of self-efficacy. The Math Self-Efficacy Scale, which was developed locally, was used to measure math self-efficacy in this study. The participants in this study were 50 junior high students who were enrolled in an advanced algebra course. The authors reported that a statistically significant relationship existed between performance accomplishment and increase in self-efficacy. Other studies on the relationship between performance accomplishments and self-efficacy have also examined the hypothesized relationship between the two and

supported the hypothesis (e.g., Lent, Lopez, & Bieschke, 1991; Matsui, Matsui, & Ohnishi, 1990).

Vicarious experience. Self-efficacy also can be acquired through modeling because modeling also has an impact on appraisal of the self-efficacy level through comparison (Bandura, 1982). When the model is quite similar to the observer, and the model's ability level is somewhat higher, then the modeling has a considerable impact on the observer's self-appraisal of self-efficacy. In that case, the model's success has a positive effect, whereas the model's failure has negative effects on the observer's self-appraisal of efficacy.

In an early study of snake phobia, Bandura, Adams, and Beyer (1977) reported a significant effect of modeling on self-efficacy in both similar threat and dissimilar threat conditions. In this study subjects were required to observe therapist handling a snake. Lopez and Lent (1992) also examined vicarious experience as a source of self-efficacy. Their study results, however, did not support the hypothesized relationship between modeling and self-efficacy.

Verbal persuasion. Verbal persuasion can have significant effects on the listener depending on the "perceived credibility and expertness" (Bandura, 1986, p. 406) of the persuader. Lopez and Lent (1992) supported Bandura's contention by reporting a statistically

significant correlation between level of verbal persuasion and self-efficacy.

Emotional arousal. It is also suggested that emotional arousal can increase or decrease self-efficacy (Bandura, 1982). According to him, changes in self-efficacy can be manifested through cognitive assessment of the source of emotional arousal, the level of the arousal, the situations under which the arousal is generated, and one's collective experiences with emotional arousal. If emotional arousal has had a positive effect on behavior, then the arousal will raise a person's self-efficacy appraisal and vice versa. In general, arousal is shown to be beneficial if the level of the arousal is optimal; too high or too low emotional arousal is usually detrimental to the performance (Bandura, 1982). The optimal level of arousal, however, may vary across individuals (Bandura, 1982). Lopez and Lent (1992) reported a non significant correlation between emotional arousal and self-efficacy.

Bandura (1982) noted that the four sources of self-efficacy have different effects on self-efficacy across different individuals. However, in general, performance accomplishments have been shown to be the most powerful source of self-efficacy, followed by vicarious experience which is the most common source of self-efficacy (Bandura et al. 1977). Lopez and Lent (1992) also tested the theory of self-efficacy sources in terms of strength by employing a

hierarchical multiple regression. The R^2 change obtained (.24) was statistically significant when performance accomplishment was entered following the other three sources of efficacy, thus indicating the significant contribution of performance accomplishment on the increase of self-efficacy.

Measurement of Self-Efficacy.

Bandura (1982, 1986) contends that the level of an individual's perceived self-efficacy varies across situations and activities. In order to have predictive and explanatory power, self-efficacy pertaining only to the task or performance of interest in a study has to be measured. According to him, accurate and detailed assessment of self-efficacy includes measurement of three dimensions of the construct: magnitude, strength, and generalizability.

The first dimension, magnitude, refers to the performance level on a task. If a person has a strong self-efficacy, that person is likely to complete a difficult task and vice versa. Thus, magnitude dimension reflects a person's self-efficacy when facing increasingly difficult task levels. The second dimension, strength, focuses on duration of performing a task. If self-efficacy is not strong, then the person's self-efficacy will not endure troublesome experience, thus further weakening the strength of efficacy. The last dimension, generalizability, concerns the application of a certain type of specific self-efficacy across different circumstances.

The three dimensions appear to convey the essential nature of self-efficacy as postulated by Bandura (1977a, 1977b, 1982). Accurate appraisal of all three dimensions of self-efficacy in a study, however, seems to be a difficult task considering seeming redundancy among the dimensions, especially between magnitude and strength. The problem with redundancy was partly manifested in the research review of self-efficacy instruments reported by Vispoel and Chen (1990). The authors noted that most published self-efficacy scales measured only one dimension of self-efficacy, strength. Presently it is not clear whether the problem stems from a possible redundancy among the dimensions or from difficulty in measuring magnitude and generalizability dimensions.

According to Vispoel and Chen (1990), 363 scales measuring self-efficacy were reported in the literature, as of 1990. The authors categorized the reported scales into ten different content domains. The content domains included psychological/clinical, social/romantic/sexual interactions, psychomotor skills, school-related, health-related, infant care/parenting, career choice, military skills, job-related, and generalized self-efficacy. The authors further subcategorized each domain, such as reading efficacy, writing efficacy, math efficacy under the school-related domain.

One instrument of particular interest measuring self-

efficacy is the Multidimensional Self-Efficacy Scale (MSES) developed by Bandura (1989). The subjects employed in the scale development were high school students. A structured interview was used to collect the data. The Multidimensional Self-Efficacy Scales (MSES) is a 59-item self-efficacy scale with nine dimensions. The dimensions include self-efficacy in enlisting social resources, self-efficacy for academic achievement, self-efficacy for self-regulated learning, self-efficacy for leisure time skills and extracurricular activities, self-regulatory efficacy, self-efficacy to meet others' expectation, social self-efficacy, self-assertive efficacy, and self-efficacy for enlisting parental and community support. Each subscale consists of four to eleven items on a 7-point Likert scale. However, no psychometric properties of the instrument were reported by the author. Bandura (personal communication, Oct.18,1995), indicated that there were only two studies that reported empirical evidence of the validity of the MSES.

One study was a path analytic study conducted by Zimmerman, Bandura, and Martinez-Pons (1992). Two subscales of the MSES were used in the study. The study explored the causal relationships among self-efficacy for self-regulated learning and academic achievement, and other school-related factors of high school students. The results indicated that the two self-efficacy subscales have both direct and

indirect impact on personal goal achievements measured by final grades, thus providing some evidence of the validity of the two subscales.

The other is a validation study of the MSES reported by Williams, Coombs, and Fuqua (1996). In this factor analytic study, nine first-order factors of the MSES were retained using a principal axis factor analysis with an oblique rotation, from which three second-order factors emerged. Based on the nine first-order factors, the authors concluded that their results partially supported the nine planned dimensions of the MSES. However, the three higher-order factors and substantial correlations among the subscales demonstrated that there was considerable degree of redundancy among the nine dimensions of the MSES. Thus, the structure of the MSES is still open to question, and the precise nature of that structure by itself has important theoretical implications.

One interesting trend in self-efficacy research is related to generalized self-efficacy. There are a handful of researchers who developed instruments to measure generalized self-efficacy. One measure is the Self-Efficacy Scale (SES) developed by Sherer, Maddus, Mercandante, Prentice-Dunn, Jacobs, and Rogers (1982). Based on Bandura's (1977a) speculation that self-efficacy may be transferable to different behavior domains depending on the level of the mastery experience, the authors hypothesized

the existence of a general self-efficacy construct. These
researchers theorized that "an individual's past experiences
with success and failure in a variety of situations should
result in a general set of expectations that the individual
carries into new situations. These generalized expectancies
should influence the individual's expectations of mastery in
the new situations" (p.664). Sherer et al. (1982) also
theorized that general self-efficacy is a relatively stable
personality trait, but fluctuates over an extended period of
time depending on successes and failures.

Sherer et al. (1982) originally produced 36 items on a
14-point Likert-type scale. These items reflect three
aspects of self-efficacy, initiation, effort expended, and
persistence as was theorized by Bandura (1977b) in a variety
of situations. A few examples of the items are 'I give up
on things before completing them.' and 'I feel insecure
about my ability to do things.' (Sherer et al. 1982, p.666).
Based on the responses manifested by two different samples
of college students, they produced a two-factor solution
utilizing the two separate samples. The two dimensions were
named 'general self-efficacy' and 'social self-efficacy'.
Accordingly, the number of items was reduced to 23 items.
The general self-efficacy explained about 27 % of the total
variance, whereas the social self-efficacy explained about
9% of the total variance. To further validate the general
self-efficacy construct, Sherer et al. (1982) also examined

the correlations between the subscale of the general self-efficacy measure and other personality measures, such as Internal-External, Personal Control, Social Desirability, Ego Strength, Interpersonal Competency, and Self-esteem. The coefficients ranged from -.51 to +.45, indicating low to moderate correlations among the measures of personality and the general self-efficacy scales.

The other instrument designed to measure generalized self-efficacy was developed by Tipton and Worthington (1984). The authors produced a 100-item scale. The items on the scale reflect a person's level of self-efficacy in specific situations across different content domains.

The major difference between the two different scales of general self-efficacy lies in the characteristics of items. The items on the scale of Sherer et al. (1982) are made of broad statements that supposedly reflect global self-efficacy. A score on this general self-efficacy scale presumably reflects a composite self-efficacy attained through successes and failures that are attributed to internal factors, but not to external factors (Shelton, 1990). On the other hand, the items on the scale of Tipton and Worthington (1984) are more situation specific and include a wide range of life experiences as items.

This movement of trying to establish a general self-efficacy construct evoked speculations concerning the relationship between the general and specific self-efficacy

constructs. In her paper regarding the development of general self-efficacy, Shelton (1990) postulated an explanatory link between general self-efficacy and specific self-efficacy. According to her, general self-efficacy may be viewed as a "trait" (p. 992) and this trait influences a person's self-efficacy in a specific situation. Thus, she further speculates, general self-efficacy explains why different people in the same situation facing the same task show different levels of self-efficacy.

The major problem associated with evaluating the construct validity of the MSES is related to the absence of information concerning the scale development. That the study results of Williams et al. (1996) does not completely support the structural dimensions of the MSES as was proposed by Bandura (1989), further complicates the matter. In addition, evidence of validity concerning the SES has not been clearly provided. The low percentage of variance accounted for by each factor with the SES casts doubts on the construct validity of generalized self-efficacy. Also, how specific self-efficacy relates to generalized self-efficacy needs further clarification. Clearly, the nature of self-efficacy is evolving as empirical studies accumulate.

<div align="center">Sex Role Orientation</div>

<u>Overview</u>

Traditionally sex has been used as a discrete

demographic variable in many empirical studies. Some try to distinguish sex from gender by defining sex as a "biological dimension of being male or female" and gender as a "social dimension of being male or female"(Santrock & Yussen, 1992, p.551). However, those two terms are frequently used interchangeably. In general, gender as a demographic variable was not useful to explain behavior between males and females except when different characteristics of tasks were examined across gender (Deaux, 1984). When a task was perceived to be feminine, there was no difference in actual performance between males and females. When a task was perceived as masculine, however, males performed better than females.

In the 1950s and 1960s there was a trend toward summarizing psychological characteristics of males and females as groups. The characterizations were bipolar in nature. For example, they were summarized as instrumentality versus expressiveness, outer space versus inner space, the sense of agency versus the sense of communion (Spence & Helmreich, 1978). The trend led to instrument development by several researchers. The publication of the widely used Bem Sex Role Inventory (BSRI) is credited for its extensive use of gender as a psychological variable. Consequently, gender as a psychological variable expressed as femininity and masculinity provided another methodological approach to

gender-related studies.

One indispensable assumption underlies feminine-masculine sex role orientation theory (Spence & Sawin, 1985). The assumption is that the femininity and masculinity are bipolar opposites on a continuum, and one's sex role orientation can be placed at some point on the continuum. Thus, individuals differ with regard to the strength of their sex role orientation. Depending on the location of one's sex role orientation, one can be categorized as sex-typed (gender schematic), cross-typed, or non-sex typed (gender aschematic or androgenous) (Spence, 1991). Sex-typed individuals are those who identify with their gender, either feminine or masculine (Spence & Sawin, 1985). Cross-typed individuals are those who identify with the opposite gender. Non-sex-typed individuals are those who possess both high masculine traits and high feminine traits.

Bem (1974) hypothesized that an androgenous person is more flexible, more able, and mentally healthier than a sex-typed person. The intriguing concept of an androgenous person attracted much attention from researchers. The ardent support for the concept was reflected through "androgenous therapy, androgenous curricula for school children, and androgenous criteria for professional positions" (Deaux, 1984, p.109).

However, some researchers noted problems related to the

androgyny model (e.g., Spence & Helmreich, 1978; Taylor &

Hall, 1982). The major criticism of the concept of

androgyny is that the construct is too broad to be measured

by the BSRI which is fundamentally a measure of a narrower

construct of instrumentality and expressiveness (Spence &

Helmreich, 1978). Thus, androgyny does not have a strong

predictive power of gender-related behavior. Taylor and

Hall (1982) support this criticism by reporting a summary of

study results in sex role orientation. They indicated that

both masculinity and femininity were as good or better

predictors of desirable personality traits, such as self-

esteem than androgyny.

Bem's Model and the BSRI

Bem's (1974) concept of sex role orientation is based

on the gender schema theory. According to her, gender

schema is a "cognitive structure"(p.355) that processes and

organizes input in terms of gender (1981a). Gender schema

is more concerned with the process than with the content

(Bem, 1981a). Society provides the content to the gender

schematic process. Bem (1981a) contends that every society

has its own standards of sex role behaviors. In the case of

the U.S., she believes that the modern American culture has

standardized desirable personality traits for each gender.

The society expects members of each gender to act

accordingly and consistently (Bem, 1981b). The sex role

behaviors are, therefore, culture specific. Regardless of

their absolute value, the culture defined sex role behaviors acquire the status of ideal models. Using one's own gender schema as internal criteria, one processes the society-imposed gender roles selectively and assimilates the selected roles according to one's gender schema. Consequently, people who use a gender schema to understand the world are different from those who do not. The former tends to conform to the culture prescribed gender roles and values, whereas the latter does not. The difference between the two types is whether or not one uses gender schema to understand the world (Bem, 1981a).

From this conceptualization, Bem (1974) developed the BSRI to test her hypothesis that one could be masculine, feminine, or both. Initially, the BSRI generated only three types of sex role orientations: feminine, masculine, and androgenous. A sex-typed person (either feminine or masculine) was characterized as one who tends to conform to social standards. More specifically, a sex-typed woman is one who is cooperative, dependent, and yielding, whereas a sex-typed man is one who acts as a leader, who is aggressive and assertive (Bem, 1974). An androgenous person was characterized as both very masculine and very feminine without employing a gender schema and that circumstances dictate which trait (feminine or masculine) is exhibited (Bem, 1977).

The original BSRI (Bem, 1977) contains two subscales.

The feminine subscale consists of 20 items that reflect feminine characteristics. The masculine subscale consists of 20 items that reflect masculine characteristics. In addition, 20 filler items were inserted in the scale. Each item is expressed on a seven-point Likert scale. Each person receives two different subscale scores, and the mean difference scores of a person on both subscales are evaluated to categorize a person into different sex role orientation. If a person's masculinity mean score is higher than the femininity mean score, then that person is considered to have a masculine sex role orientation, and vice versa. If the scores on both subscales are about the same or equal, that person is considered to have an androgenous sex role orientation. That scoring scheme, however, ensued a theoretical dilemma.

Based on the operational definition those who scored low on both masculinity and femininity scales were also categorized as androgenous (Bem, 1974). The conceptual definition of an androgenous person, however, is one who can be highly masculine and highly feminine depending on the situation. This discrepancy led to a revision of the scoring scheme, resulting in the creation of a new sex role orientation category. The new type was labeled as 'undifferentiated' (Bem, 1977).

Since the appearance of the BSRI in the literature, different types of validity evidence of the scale have been

examined by several researchers. The most widely cited
validation study is the factor analytic study of Pedhazur
and Tetenbaum (1979). The results of their study which
produced a four-factor solution did not support the two-
factor approach of the BSRI. In addition to the two
factors that loaded femininity items and masculinity items,
there were two factors that loaded items that were unrelated
to the first two factors. Those items included adjectives
such as "masculine", "feminine", "childlike", "gullible",
etc. Following Pedhazur and Tetenbaum's (1979) suggestions,
Bem revised her original form and developed a short form of
the 30-item BSRI after she eliminated the above items.

Another construct validation study was reported by
Waters and Popovich (1986) in which a principal component
analysis with a varimax rotation was conducted. The four-
factor solution retained by the authors did not support the
two-dimensional hypothesis. More validity studies were
conducted on both the original and the revised BSRI (e.g.,
Gaa, Liberman, & Edwards, 1979; Martin & Ramanaiah, 1988).
To date, there is no consensus concerning the factor
structure of the BSRI.

Spence's Model and the PAQ

Spence's (Spence, Helmreich, & Stapp, 1975) model is
based on the gender identity theory that proposes gender-
related attributes are multifaceted and complex with
different facets being independent of each other, whereas

sex role orientation is unifaceted (Spence, 1991).
According to her, there are two types of sex role
orientation; internalized sex role orientation and society-
influenced sex role orientation. What needs to be reflected
in the measurement of sex role orientation, according to
Spence and Helmreich (1978), is one's internalized sex role
orientation (sex role taking), not socially imposed sex role
orientation (sex role playing). A person is role taking if
sex role orientation is consistent with self-concept. On
the other hand, a person is role playing if sex role
orientation is inconsistent with an internalized sex role
(1978). However, sex role orientation is situation
specific. It is not generalizable to different situations
in which different types of role behaviors are expected.
Thus, Spence believes that sex role orientation needs to be
defined and assessed more narrowly than the femininity-
masculinity personality traits which are a more global
construct. Based on this conceptualization, the Personality
Attributes Questionnaire (PAQ) was developed (Spence et al.,
1975).

The items on the PAQ were derived from the Sex Role
Stereotype Questionnaire (Rosenkrantz, Vogel, Bee,
Broverman, & Broverman, 1968). The long form of the PAQ
consists of 55 items which contains 23 Masculine items, 18
Feminine items, and 13 Masculine-Feminine items. Masculine
items (M scale) reflect socially desirable characteristics

perceived by both genders, but are shown in males to a greater degree. The items on the M scale reveal instrumental traits, such as being competitive, independent, or self-confident. Similarly, Feminine items (F scale) reflect socially desirable characteristics perceived by both genders, but are exhibited in females to a greater degree. The items on the F scale reveal expressive and "communal" (p.33) traits, such as kind, gentle, devotion to others (Spence & Helmreich, 1978). Masculine-Feminine items (M-F scale) contain both male-valued and female-valued characteristics. These items reflect either instrumental or expressive traits. A short form of the PAQ was also developed by selecting eight items of each subscale, resulting in a 24-item scale. The correlation coefficients between the original and the short form were over .90 indicating that the two are fairly equivalent forms of the measure (Spence & Helmreich, 1979).

Some factor analytic studies produced a two-factor solution (e.g., Cota & Fekken, 1988; Helmreich, Spence, & Wilhelm, 1981). Based on the results of those studies Spence asserts that the items on the PAQ are more homogenous than the items on the BSRI. On the other hand, other studies reported a multifactor solution (e.g., Antill & Cunningham, 1982; Gaa, Liberman, & Edwards, 1979). The conflicting results, thus call for further empirical evidence.

Relations between Bem's Model and Spence's Model

Since the appearance of the BSRI and the PAQ, the concept of androgyny has drawn more attention than femininity and masculinity. However, Bem (1981b) takes the position that consistency in behavior like sex-typed personality, not inconsistency in behavior like androgenous personality is the aspect of human behavior that needs to be examined. Sex-stereotyped people, according to her, tailor their behaviors by referring back to the cultural norm. Their behaviors are consistent depending on their sex role orientation, and that consistency in behavior may reflect a significant factor that distinguishes different individuals. Bem (1981c) asserts, therefore, that the BSRI is a measure for identifying sex-typed individuals described as feminine or masculine. It is interesting to note at this point that Bem's (1974) original intention for the BSRI scale development was to test whether or not an androgenous personality exists.

Spence (1991) contends that the PAQ does not measure global constructs such as sex role orientation or gender schematization due to the fact the conceptual background of the instrument is not based on those broad constructs. Spence's (1991) position is that sex role orientation is just one small dimension of multifaceted sex-related attributes (Spence, 1991; Spence, 1993; Spence & Helmreich, 1978). Thus, a global construct such as femininity and

masculinity or sex role orientation is not useful in
predicting gender-related behaviors. What needs to be
measured, she maintains, is narrower personality traits such
as expressiveness or instrumentality.

This led Spence and Helmreich (1978) to the powerfully
manifested skepticism concerning the construct validity of
the BSRI. She and her colleague showed skepticism regarding
the BSRI as a measure of a broad construct like gender role
identity or gender schematic processing. Spence and
Helmreich (1978) cite moderate to high correlations between
the M scales on the two measures, which range from .72 to
.84 and the .52 to .71 for the F scales as of 1984.
Lubinski, Tellegen, & Butcher (1983) also reported high
correlations between the two measures: .75 between the two F
scales and .72 between the M scales. Overall, the patterns
of the correlations are consistent (M lower than F) across
studies except when using short versions of BSRI (Spence,
1991). Thus Spence concludes that the BSRI rather measures
narrower personality trait such as instrumentality or
expressivity. To this criticism, Bem replies (1981c) that
the BSRI triggers different traits for different
individuals. For example, responses of sex-typed
individuals to the BSRI items reflect one's masculinity or
femininity, whereas it may trigger instrumentality or
expressiveness for non sex-typed ones. There are some who
support Bem's position. For instance, Frable (1989) asserts

the PAQ measures only instrumentality & expressiveness, whereas the BSRI is good for studies trying to link gender personality and ideology. Some (e.g., Blanchard-Fields, Suhrer-Roussel, & Hertzog, 1994) including Spence contend that both measure the same construct.

Bem (1981a, 1981b, 1981c) asserts that the BSRI measures masculinity, femininity, instrumentality, and/or expressiveness depending on whether a person is sex-typed or not. Spence (1975, 1991) maintains that the PAQ measures instrumentality or expressiveness. Regarding what construct each instrument measures, empirical studies repeatedly reported relatively high correlations between the two measures. Therefore, both instruments appear to measure the same construct. What construct they measure remains to be further examined.

Correlates of Self-Efficacy

Self-efficacy and Self-esteem

Self-esteem is one of the constructs that have been studied in its relation to self-efficacy. Sherer et al. (1982), reported the results of their validation study of the Self-Efficacy Scale (SES), in which self-esteem was also examined. The self-esteem measure used in this study was Rosenberg's Self-Esteem Scale. Subjects in the study were 376 students enrolled in an introductory psychology course. The authors reported a weak relationship between general self-efficacy subscale and self-esteem. They also reported

a weaker relationship between social self-efficacy and self-esteem than the relationship between general self-efficacy and self-esteem.

In their replication study, Woodruff and Cashman (1993) supported the relationship between self-efficacy and self-esteem found by Sherer et al. (1982). Woodruff et al. (1993) used the same instrument that Sherer et al. (1982) used to measure self-efficacy and Rosenberg's instrument to measure self-esteem. Subjects in their study were 220 males and 180 females enrolled in an introductory management course. The magnitude of the correlation coefficients between the two constructs reported in this study were close to the magnitude reported by Sherer et al. (1982).

The authors of both studies suggested that self-efficacy is not strongly related to self-esteem. More specifically, Sherer et al. (1982) contends that self-efficacy is a different construct from self-esteem judging from the sizes of correlation coefficients. Thus, they assert that the construct validity of the general self-efficacy scale has been established. However, their assertions may warrant a counter-assertion. The coefficients reported in both studies were -.51 between self-esteem and general self-efficacy, -.28 between self-esteem and social self-efficacy in the study of Sherer et al. (1982). Similarly, a correlation coefficient of -.54 between self-esteem and general self-efficacy, -.29 between

social self-efficacy and self-esteem reported in the study of Woodruff et al. (1993). Therefore, it seems that the magnitudes of the correlation coefficients are too big to provide evidence of divergent construct validity.

Self-efficacy and Depression

Some researchers try to explain depression in relation to the cognitive capability of a person. Ehrenberg, Cox, and Koopman (1991) examined the relationship between self-efficacy and depression. The participants in this study were 172 male and 194 female high school students. Both general and specific self-efficacy were measured by three different efficacy scales. The Self-Efficacy Scale (Sherer et al., 1982) was used to measure general self-efficacy and social self-efficacy. The Physical Self-Efficacy Inventory was used to measure physical self-efficacy. Academic self-efficacy was measured by the Measure of Academic Self-Efficacy. Then, the composite score of self-efficacy was obtained by summing the scores on each instrument. Participants' depression levels were assessed by the Beck Depression Inventory.

Ehrenberg et al. (1991) reported that there were significant negative correlations between different scores of self-efficacy and depression scores with the exception of the score between social self-efficacy and depression. Academic self-efficacy was most strongly related to depression, followed by general self-efficacy, and physical

self-efficacy. The total self-efficacy was strongly related to depression because the total is a composite score.

The results of the study indicate that overall, severe depression is related to low level of self-efficacy, and vice versa. The results further indicate that academic self-efficacy is more closely related to depression than social self-efficacy for the high school student population.

Correlates of Sex Role Orientation

Self-esteem has been the most commonly studied construct in relation to sex role orientation. In one of Bem's (1977) validation studies, she examined the relationship between sex role orientation measured by the BSRI and self-esteem measured by The Texas Social Behavior Inventory (TSBI). The TSBI is a measure of a person's interpersonal skill confidence, thus viewed as a social self-esteem measure. Using the responses of 375 male college students and 290 female college students enrolled in an introductory psychology course, Bem (1977) divided each gender group into four categories using the median split: high feminine-high masculine (androgenous), high feminine-low masculine (feminine), low feminine-high masculine (masculine), and low feminine-low masculine (undifferentiated). Among the eight groups, females who belong to the androgenous group exhibited the highest level of self-esteem followed by males in the masculine group, males in the androgenous group, and the females in the

masculine group. The undifferentiated groups of males and females exhibited the lowest self-esteem.

Similar results regarding the relationship between sex role orientation measured by the PAQ and self-esteem measured by The TSBI were reported by Spence et al. (1975). The subjects in the study of Spence et al. (1975) were 248 males and 282 females of whose sample characteristics were very close to the subjects in Bem's study. In her study the female androgenous group showed highest mean self-esteem, followed by the male androgenous group, female masculine group, and male masculine group. The undifferentiated groups of both gender were also the lowest groups.

The patterns of the relationship emerged from the two studies of Bem (1977) and Spence et al. (1975). Androgenous individuals seem to posses high self-esteem in both gender groups. Individuals who posses high masculinity also seem to have high self-esteem, followed by individuals who posses high femininity. The undifferentiated who have low masculine and low feminine traits possess low self-esteem regardless of gender. In general, other study results also support the general patterns (e.g., Antill & Cunningham, 1979; Gauthier & Kjervik, 1982; Lau, 1989; Long, 1986).

Self-Efficacy and Sex Role Orientation

Very little research has been reported relating self-efficacy to sex role orientation. In one study the relation of career self-efficacy and sex role orientation was

examined (Matsui & Onglatco, 1991). The subjects in the study were 412 full-time female clerical employees in Japan. The Japanese version of BSRI was used to measure sex role orientation. The authors defined masculine trait as instrumentality and feminine traits as expressiveness. The task-specific self-efficacy in six content domains was measured by a locally developed measure of self-efficacy. The six domains were realistic, investigative, artistic, social, enterprising, and conventional. Given 30 work tasks representing different domains, subjects were asked to rate their competency in completing each task successfully on a five-point scale. Using a median split subjects were divided into four groups based on their scores on the BSRI: androgenous, instrumental, expressive, and undifferentiated. Among the four groups the androgenous group showed the highest mean of self-efficacy, followed by instrumental, expressive, and undifferentiated. Matsui and Onglatco (1991) also examined the contributions of instrumentality and expressiveness to predicting self-efficacy in six different environment domains; realistic, investigative, artistic, social, enterprising, and conventional environments. To achieve the goal, they hierarchically regressed self-efficacy on instrumentality, then on both instrumentality and expressiveness, and observed R^2 increment. Similarly, self-efficacy was regressed first on expressiveness, and on both expressiveness and

instrumentality. Based on the R^2 increment values, Matsui and Onglatco (1991) reported that instrumentality showed the most significant increment in predicting self-efficacy in the enterprising domain (.39). Expressiveness, on the other hand, showed the most significant amount of R^2 increase in the social domain (.21).

Matsui (1994) also conducted a similar study using Japanese university students. The subjects in the 1994 study were 176 males and 210 females who were enrolled in an introductory psychology course in Japan. The mean ages for both gender groups were slightly over 18. A locally developed questionnaire was used to measure career self-efficacy, in male-dominated occupations or female-dominated occupations. Instrumentality and expressiveness were measured by a Japanese version of the BSRI. The author reported that males showed approximately the same magnitude of self-efficacy for both male- and female-oriented occupations. Female students, however, showed lower self-efficacy for male-dominated occupations, but higher self-efficacy for female-dominated occupations. Instrumentality was significantly related to self-efficacy for females in male-dominated occupations, whereas expressiveness was significantly related to self-efficacy for females in female-dominated occupations. High instrumentality and high expressiveness were related to males in both male-dominated and female-dominated occupations. One of the interesting

findings reported was that the gender was not a significant predictor of career self-efficacy. In both of Matsui's (1991, 1994) studies, it was reported that instrumentality is more significantly related to career self-efficacy than expressiveness. The results indicate that a stronger relationship may exist between self-efficacy and masculinity than that of self-efficacy and femininity.

Summary

The importance of self-efficacy as a psychological construct has been well established through numerous empirical studies in which the relationship of self-efficacy to behavior or to other constructs has been examined. As was theorized by Bandura (1977a, 1977b, 1982), self-efficacy appears to be the central construct that affects human behavior.

The dimensions of self-efficacy construct, however, have not been clearly delineated. The multidimensions of self-efficacy as proposed by Bandura (1989) have not been supported. The issues regarding the specificity and generality of self-efficacy also have been addressed without definite conclusions.

Despite wide application of the self-efficacy construct in psychology, the relationship between self-efficacy and sex role orientation has not been thoroughly investigated. More specifically, the relationships between the dimensions of self-efficacy and the dimensions of sex role orientation

has been omitted in the literature.

CHAPTER III

METHOD

The topics presented in this chapter include a description of the participants, the instruments and their psychometric properties, an outline of the procedures, and the data analyses employed in this study.

Participants

The participants were 651 undergraduate students enrolled in an introductory psychology course at a large midwestern university. They were recruited during the fall of 1995 and during the spring of 1996. Participants were recruited from introductory psychology courses in which they received extra credit upon completion of their participation in the study. Students who elected not to participate in this study had other means to obtain the extra credit.

The participants were predominantly white, single, and freshman. The average age of the participants was approximately 20 (Table 1). Approximately half of the participants were females, and the other half were males. Relevant demographic information for the participants is presented in Table 2.

Table 1

Means and Standard Deviations for Age

Sample	N	Mean	Standard Deviation
Females	330	19.79	3.43
Males	321	20.34	3.75
Total	651	20.06	3.60

Table 2

Frequencies and Percentages for Gender, Ethnicity, Grade, and Marital Status

Group	N	%
Gender		
Female	330	50.7
Male	321	49.3
Ethnicity		
African-American	22	3.4
Native American	30	4.6
Caucasian	517	79.5
Hispanic	12	1.8
Asian	62	9.5
Other	8	1.2

Grade

Freshman	320	49.2
Sophomore	186	28.6
Junior	66	10.1
Senior	71	10.9
Other	8	1.2

Marital Status

Single	564	86.6
Married	37	5.7
Divorced	10	1.5
Partnered	40	6.1

Instruments

The instruments used in data collection included a demographic questionnaire, the Multidimensional Self-Efficacy Scales, the Self-Efficacy Scale, the Bem Sex Role Inventory, and the Personal Attributes Questionnaire.

Demographic Information Questionnaire

Age, gender, classification, ethnicity, self-ratings of academic achievement, self-ratings of masculinity, self-ratings of femininity, and expected grade were included in the questionnaire (see Appendix M).

Multidimensional Self-Efficacy Scales (MSES)

The MSES is a self-report measure of perceived self-efficacy developed by Bandura (1989). There are a total of

57 items on a 7-point Likert-type scale. The 7-point scales are expressed as 1=not well at all, 3=not too well, 5=pretty well, and 7=very well. Respondents are instructed to choose the option that best reflects their opinions about each statement. There are nine subscales included in the MSES. The subscales include Self-Efficacy in Enlisting Social Resources (5 items), Self-Efficacy for Academic Achievement (9 items), Self-Efficacy for Self-Regulated Learning (11 items), Self-Efficacy for Leisure Time Skills and Extracurricular Activities (8 items), Self-Regulatory Efficacy (9 items), Self-Efficacy to Meet Others' Expectations (4 items), Social Self-Efficacy (4 items), Self-Assertive Efficacy (4 items), and Self-Efficacy for Enlisting Parental and Community Support (4 items) (See Appendix B).

The psychometric properties of the MSES have not been well established. The only study that has reported the psychometric properties of the entire scale as well as of each subscale is that of Williams, Coombs, and Fuqua (1996), in which college bound high school students were the participants. The following subsection for validity and reliability of the MSES is based on the results reported by those authors.

Reliability of the MSES.

Williams et al. (1996) reported Cronbach's alpha coefficient of .92 for the overall scale. The alpha

coefficients for each of the nine subscales reported by the same authors are as follows: Self-Efficacy in Enlisting Social Resources (.60), Self-Efficacy for Academic Achievement (.74), Self-Efficacy for Self-Regulated Learning (.87), Self-Efficacy for Leisure Time Skills and Extracurricular Activities (.74), Self-Regulatory Efficacy (.80), Self-Efficacy to Meet Others' Expectations (.74), Social Self-Efficacy (.83), Self-Assertive Efficacy (.84), and Self-Efficacy for Enlisting Parental and Community Support (.71). The overall internal consistency reliability is relatively high, but some subscales, especially those with a small number of items, have low reliability. For instance, the Self-Efficacy in Enlisting Social Resources subscale has four items and the reliability coefficient reported by Williams et al. (1996) is .60.

Validity of the MSES.

Williams et al. (1996) took a factor analytic approach to examine construct validity of the MSES. The factor structure of the instrument was examined by principal axis factor analysis with promax (oblique) rotation, from which the authors retained a nine-factor solution with 92% of the variance accounted for by the nine primary factors. The size of the correlations of these nine factors with their respective subscales range from .68 to .97, indicating that the subscales have high degree of construct validity. However, the authors further examined a second-order factor

structure of the MSES due to substantial correlations among the factors and among the subscales. A three higher-order factor solution was retained utilizing principal axis with promax rotation. The three factors accounted for 62% in the total variance and were named social, academic, and task management.

Self-Efficacy Scale (SES)

The Self-Efficacy Scale is a self-report measure of general self-efficacy developed by Sherer et al. (1982). The original version of the scale consisted of 36 items. Based on the initial two-factor solution on the original scale, a revised scale of 23 items was developed. Consequently, the revised form consists of two subscales; general self-efficacy and social self-efficacy. There are 17 items on the general self-efficacy subscale and 6 items on the social self-efficacy subscale. Respondents are expected to rate their agreement with each item on a 5-point Likert-type scale ranging from 1=strongly disagree to 5=strong agree. Higher scores indicate higher level of self-efficacy. Several validation studies (e.g., Sherer & Adams, 1983; Tipton, & Worthington, 1984; Woodruff & Cashman, 1993) followed the publication of the scale.

Reliability of the SES.

Internal consistency reliability was reported by Sherer et al. (1982) in their initial self-efficacy scale development study. In this study subjects were 376

undergraduate students enrolled in an introductory psychology class. The Cronbach's alphas reported were .86 for general self-efficacy subscale, and .71 for the social self-efficacy subscale, respectively. An overall alpha coefficient was not reported. In their replication study of Sherer et al. (1982), Woodruff and Cashman (1993) also reported Cronbach's alpha coefficients for each subscale. A coefficient of .84 was obtained for the general self-efficacy subscale, and .69 for the social self-efficacy scale. The subjects in this study were 220 males and 180 females enrolled in an introductory management class.

Based on the above two studies, the general self-efficacy subscale appears to have higher internal consistency reliability than the social self-efficacy subscale. However, the extent of the relations of each item to the total scale is not known. Also, other types of evidence of reliability (e.g., test-retest) have not been reported, thus limiting the interpretability of general self-efficacy in terms of stability.

Validity of the SES.

The authors attempted to establish a divergent validity evidence by correlating SES subscale scores to selected personality measures. The correlation coefficients reported by Sherer et al. (1982) between several measures and self-efficacy subscales are as follows: Rotter's I-E scale measures attributional style with low scores indicating

higher internality. The correlation coefficient between I-E

score and general self-efficacy subscale score was -.29, and

-.17 with social self-efficacy subscale. The correlation

coefficients between the Marlowe-Crowne Social Desirability

Scale and the general self-efficacy subscale was .43, and

.28 with the social subscale. The Ego Strength scale is a

measure of the degree of persistency, adjustment, and social

skill. The coefficient between this measure and general

subscale was .29, and .06 with social. The Interpersonal

Competency scale is a measure of personal effectiveness,

ability to deal with others, and global positive mental

health. The correlation between this measure and the

general subscale was .45, and .43 with the social subscale.

The correlation coefficients between Rosenberg's Self-esteem

scale and the general subscale was -.51, and -.28 with the

social subscale, respectively. On this self-esteem scale

low scores indicate high self-esteem. Based on the

magnitude and the direction of the correlation coefficients

between the selected measures and the self-efficacy

subscales, Sherer et al. (1982) concluded that the evidence

of construct validity is present in the SES.

Woodruff and Cashman (1993) in their replication study

of Sherer et al. (1982) also reported correlation

coefficients between similar measures that were used in the

study of Sherer at al. (1982) and the SES. The patterns of

the correlation coefficients reported were very similar to

the patterns reported by Sherer at al. (1982).

In another validation study, Sherer and Adams (1983) reported correlation coefficients between three different measures and the SES. The measures included were the MMPI with ten subscales, the Rathus Assertiveness Schedule, and the Bem Sex Role Inventory. Overall, the correlation coefficients reported were low and insignificant with a few exceptions. Of particular interest is the correlation coefficients between Bem's masculinity subscale and the SES subscales. The correlation coefficient between the masculinity subscale scores and the general self-efficacy subscale scores was .54 (p<.05), and the coefficient between the masculinity subscale scores and the social subscale scores was .38 (p<.05). With the femininity subscale, however, the correlation coefficients were -.19 (p<.05) with the general subscale and .06 (NS) with the social subscale.

More evidence of construct validity based on the factor analytic study was reported by Sherer et al. (1982) and Woodruff and Cashman (1993). Sherer et al. (1982) selected a two-factor (general and social) solution. The authors suggested that there was tentative evidence that the general factor could be divided into two factors. In this study, the total variance accounted for by the general factor was 27%, and the social factor, 9%. Woodruff and Cashman (1993) replicated the study of Sherer et al. (1982) and suggested a five-factor solution. The general factor in the study of

Sherer et al. (1982) was further broken down into three factors, and the social factor was broken down into two factors. The authors concluded that the five-factor solution supports Bandura's three dimensions of self-efficacy (i.e., strength, magnitude, and generality). Accordingly, the authors named five factors general efficacy magnitude, general efficacy strength, general efficacy competence, social efficacy competence, and social efficacy strength.

Overall, the results of the three studies show that self-efficacy is not strongly related to personality measures. Thus, it appears that the SES does not measure the common personality traits that were previously mentioned. However, the structural dimensions of the SES are inconclusive and remains to be further validated.

In order to establish criterion validity evidence, Sherer et al. (1982) adopted a concurrent validation approach by examining the relationship between past success experience and self-efficacy. The authors selected three areas that were believed to be important life areas to measure past success experience. The areas included were vocation, education, and military experience. One hundred fifty inpatients from a veterans medical center completed the questionnaire that measured past success experience in the three areas and the self-efficacy measure that Sherer et al. (1982) developed. Criteria for vocational success were

measured by employment status (i.e., employed or unemployed), the number of jobs quit, and the number of times fired. The criterion for educational success was measured by highest educational level completed. The highest military rank was the criterion for military success. The sizes of the correlation coefficients between the above criteria and the two subscales of self-efficacy reported by the authors range from .10 to .30. The authors concluded that the SES has some evidence of criterion validity.

Woodruff and Cashman (1993) adopted a different approach from Sherer et al. (1982); they used a predictive validation approach by examining the relationship between goal setting and self-efficacy. The criterion for the goal setting was expected grades of 220 males and 180 females in an introductory management course. They reported that the mean difference in self-efficacy between those whose goal was a grade of A and those whose goal was a grade of B was significantly different at .01 alpha level. The authors suggested that the results provided more evidence of criterion validity of the SES.

It is interesting to note that the two different studies utilized different criterion validation approaches. Sherer et al. (1982) employed a concurrent validation approach, which means that the focus was on the effect of past performance on self-efficacy. On the other hand,

Woodruff and Cashman (1993) adopted a predictive validation approach, which means the focus was on the effect of self-efficacy on future performance.

The concurrent validity coefficients reported by Sherer et al. (1982) are low which indicates that the SES does not have high discriminating power among individuals on the specified criterion. The low coefficients may reflect inappropriate criterion selected in the study, or low reliability of the SES. Also, the group selected for the study was a subpopulation that was too unique to be generalized.

Bem Sex Role Inventory (BSRI)

The BSRI is a self-report measure of sex role orientation developed by Bem (1974). The original form consists of 60 items of which 20 are fillers. Each item is expressed on a 7-point Likert-type scale with 1=never or almost never true and 7=always or almost always true. Respondents are instructed to indicate how well each item describes himself or herself. Due to criticisms, on psychometric grounds, of the original form, a short form which consists of 30 items was developed by the same author. However, psychometric properties of the original form have been better documented than the short form. Further, the items on the short form come directly from the original form. Thus, further review of the psychometric properties of the BSRI is centered on the original form.

Reliability of the BSRI.

Bem (1974, 1978) reported Cronbach's alpha obtained from two samples to indicate the internal consistency of the original form. There were 279 females and 444 males in the first sample, and 340 females and 476 males in the second sample. Both samples consisted of undergraduate students in an introductory psychology course at Stanford University. Coefficient alphas observed were .80 for the femininity subscale scores and .86 for masculinity subscale scores from one sample. Coefficient alphas observed from the other sample were .86 for masculinity and .82 for femininity subscale. Those observed coefficient alphas indicated high consistency among the items.

Bem (1974) also reported a test-retest reliability with 4-week interval obtained from 28 females and 28 males from a Stanford sample. The reliability coefficient was also computed separately for females and males. On the original scale the reliability coefficients were .82 for females on femininity, .94 for females on masculinity, .89 for males on femininity, and .76 for males on masculinity, respectively. On the short form the reliability coefficients were .85 for females on femininity, .91 for females on masculinity, .91 for males on femininity, and .76 for males on masculinity, respectively.

Validity of the BSRI.

Bem (1974) reported correlation coefficients between

two common sex role measures and the BSRI to show that the BSRI taps a different construct. With the California Psychological Inventory the correlation coefficients ranged from -.42 to .50. With Guildford-Zimmerman Temperament Survey the coefficients ranged from -.04 to .15.

Bem (1981a) also reported whether or not groups differ on several personality measures. She formed four groups using a median split; androgenous, feminine, masculine, and undifferentiated. An Anova was performed to see how groups differ on self-esteem measured by the Texas Social Behavior Inventory. The results showed that the androgyny group and the masculine group showed significantly higher self-esteem than the feminine group and the undifferentiated group.

A number of exploratory factor analytic studies have been conducted, but without yielding consistent results. For example, some studies selected a four-factor solution (e.g., Pedhazur & Tetenbaum, 1979), but some suggested a five-factor solution (e.g., Gaa et al., 1979) on the original form. A confirmatory factor analytic study was conducted by Martin and Ramanaiah (1988) on both forms of the BSRI. They used both a two-factor model and a four-factor model to examine a better fit to the data. Based on the incremental fit indices for both models, the authors suggested that the degree of fit is about the same for both models and that the two-factor model is a better fit for the short form of the BSRI.

Another issue related to the validity of the BSRI is the relationship between masculinity and femininity measured by the inventory. Bem (1981) concluded that masculinity and femininity measured by the BSRI are independent of each other due to the way items were pooled. In addition, she cited the correlation coefficients between femininity and masculinity within each gender group to add more evidence of the independence of each construct. The coefficients reported ranged from -.14 to .11 on the original form, and from .10 to .33 on the short form.

Personal Attributes Questionnaire (PAQ)

The PAQ is a self-report measure of sex role orientation developed by Spence et al. (1975). The original form consists of 55 items on a 5-point Likert-type scale. The original form was later shortened to a more conceptually pure form that consists of 24 items. There are three subscales on the PAQ. The M scale reflects instrumental personality traits that are more desirable for males than females. The F scale reflects expressive personality traits that are more desirable for females than males. The M-F scale reflects both instrumental and expressive traits. Each subscale consists of eight items. Later, however, the short form was extended to 40 items as a result of adding eight more items that reflect socially undesirable traits to both the M scale and the F scale.

Reliability of the PAQ.

Spence (1986) reported Cronbach's alpha obtained from college samples to indicate the internal consistency of the short form. The coefficients obtained were .85, .82, and .78 for the M, the F, and the M-F scales, respectively.

Validity of the PAQ.

Gaa, Teresa, and Edwards (1979) reported the results of factor analysis on the short form of the PAQ. They employed a principal component factor analysis with orthogonal rotation. The subjects in this study were 184 undergraduate students. The results showed that there were four dimensions on the PAQ with 40% of the total variance accounted for by the four factors. They named the factors as empathy, emotional, aggressive, and self-confident.

Procedures

The order of administration of the four instruments (MSES, SES, BSRI, and PAQ) along with a demographic questionnaire and a consent form was controlled by randomly assigning one of the 24 possible orders at random to each participants or a small group of participants. The actual procedure used to achieve random assignment of the order of the variables was to flip a coin. The instruments were administered to a group of participants at various scheduled times. Prior to administration, standardized instructions (Appendix J) were read to each group of participants.

Statistical Analyses

Statistical analyses of the data included three
components that correspond to the four research questions
listed in Chapter I. The preliminary analyses consisted of
reliability analyses of the four instruments and factor
analysis of the MSES and SES in addition to descriptive
statistics. Principal axis factor analysis was utilized and
oblique and orthogonal rotations were compared. Resulting
factors were conceptually interpreted and named. The second
level of analysis involved canonical correlation and
regression analysis relating MSES factor scores and SES
factor scores to sex role orientation measures. Zero-order
correlations were also obtained to compare the self-efficacy
factor scores with masculinity to the same correlations with
femininity. The final data analysis phase involved
regressing the factor scores from the MSES and the SES on
the global measure of sex role to examine their
relationships. As procedural analyses, discriminant
function analysis and multiple regression were performed to
explicate sex differences. In addition, the MSES factor
scores and the SES factor scores were also regressed on the
MSES scale scores and on the SES scale scores.

CHAPTER IV

RESULTS

The results presented in this chapter are the preliminary analyses of the instruments, the analyses for the research questions, and the procedural analyses.

Preliminary Analyses of Instruments

Reliability analyses

Prior to the major analyses, internal consistency reliability analyses were conducted to estimate the extent of the consistency of participants' responses to the MSES, the SES, the BSRI, and the PAQ (see appendix A). The Cronbach alpha coefficients for the nine subscales of the MSES ranged from .63 to .87. The overall reliability coefficient for the 57 items was .92. Williams et al. (1996) reported that the coefficients ranged from .60 to .87, with an overall coefficient of .92, observed from a precollege sample of 500.

The coefficient alphas for the general and social self-efficacy subscales of the SES were .83 and .69, respectively. The overall alpha was .86. The coefficient alphas reported by Sherer et al. (1982) were .86 for general self-efficacy subscale, .71 for social self-efficacy subscale; Woodruff and Cashman (1993) reported .84 for general, .69 for social. Both studies employed college

samples.

Coefficient alphas for the femininity subscale and masculinity subscale of the BSRI were .86 and .88, respectively. Bem (1974) reported a coefficient alpha of .86 for the masculinity subscale and .80 for the femininity subscale based on the Stanford University sample. Coefficient alphas for the femininity and masculinity subscales of the PAQ were .78 and .77, respectively. The coefficient alphas reported by Spence (1986) were .85 for the masculinity and .82 for the femininity subscale based on a college sample. The coefficient alphas for each subscale for each instrument are presented in Appendix A.

Descriptive Statistics

The means and standard deviations of the MSES, SES, BSRI, and PAQ for both genders and for the total sample are shown in Appendix B. For the MSES and the SES, the higher the score the higher self-efficacy the participants report. For the BSRI and the PAQ, the higher the score the more masculinity and/or femininity the participants reported. The means for BSRIM and BSRIF for both gender groups observed from the sample of this study ranged from 4.64 to 5.37. The standard deviations ranged from .55 to .70. Bem (1974) reported that the means for both gender groups based on the Stanford University sample of 723 ranged from 4.44 to 5.01. The standard deviations reported by Bem (1974) ranged from .52 to .69.

All the means and standard deviations are reported utilizing the same metrics as the original scales. Both the original scales of the MSES and the BSRI utilize a 7-point Likert-type scale, whereas both the SES and the PAQ utilize a 5-point Likert-type scale. However, the scoring scheme for the PAQ required recoding of the original scales of 1 - 5 to 0 - 4.

Intercorrelations of the Instruments

The subscale structures of the MSES, SES, BSRI, and PAQ were examined by observing the correlation coefficients between each of the measures. The coefficients of the nine subscales of the MSES ranged from .03 to .56 and are presented in Appendix A. Thirty-three of the 36 coefficients were statistically significant at .01 alpha level. The observed coefficients indicated that the nine subscales of the MSES are not orthogonal, and they share variance up to 31%. The coefficient of the two subscales of the SES was substantial (r=.63, p<.01), indicating that about 40% of the total variance was shared by the general and the social subscale.

As was expected, the correlations between masculinity and femininity subscales of the BSRI and the PAQ were not statistically significant. This finding substantiated the suggestion of several researchers (e.g., Antill & Cunningham, 1982; Bem, 1981b; Helmreich, Spence, & Wilhelm, 1981) that masculinity and femininity are two distinctive

constructs.

Analyses for the Research Questions

Factor analyses were performed to achieve two goals; one was to respond to research question 1 and research question 2, and the other was to reduce the number of variables for subsequent data analyses. Prior to conducting factor analyses, the adequacy of running a factor analysis on each measure was assessed in two ways. First, the correlation matrix of each instrument was visually inspected to check the size of the correlation coefficients. Coefficients in both matrices were from low to medium. The visual inspection suggested that conducting factor analysis was proper. Then, the entire correlation matrices of the MSES and the SES were tested by Bartlett's test. The Chi-square values obtained were 17705.31 for the MSES and 3541.76 for the SES. Both Chi-square values were significant with alpha set at .01, indicating that the entire correlation matrix for each measure was statistically significant in the population. The visual inspection of the correlation matrix and the results of the Bartlett tests showed that the intercorrelations among the items of both measures were significant in the population. Thus, applying factor analysis on the MSES and the SES was considered appropriate. Both factor analyses were performed utilizing SPSS.

Factor Analysis on the MSES

A factor analysis was performed to respond to research question 1,

"What are the structural dimensions of the Multidimensional Self-Efficacy Scales with a college population?". Initially, 14 factors with eigenvalues greater than 1.0 were extracted by performing principal axis factor analysis on the correlations of the 57 items. Those 14 factors accounted for approximately 64% of the total variance. The 14 factors initially extracted are summarized in Table 3. A visual inspection of the scree plot suggested that eight to ten factors may represent the factor structure of the self-efficacy multidimensional scales more accurately (see Appendix H). Each number of the factor solution, from eight to ten, was first rotated orthogonally. Varimax rotation was utilized for the orthogonal solution. Following orthogonal rotation, each factor solution was also obliquely rotated, from most oblique (delta=0) to least oblique (delta=-5), utilizing oblimin rotation. All solutions were evaluated for each factor solution. Kaiser's eigenvalue greater than 1, Cattell's scree test, the amount of total variance accounted for, the number of items loading on each factor, and theoretical considerations were used to compare the various solutions. A nine-factor model, similar to the theoretical structure proposed by Bandura, was considered to be the best. Oblimin rotation with delta set

Table 3

Variance Associated with the Initial Factors (N=651)

Measure	Factor	Eigenvalue	% of Variance	Cum %
MSES	1	11.4	19.9	19.9
	2	3.9	6.9	26.8
	3	3.4	6.0	32.8
	4	2.7	4.8	37.6
	5	2.4	4.2	41.9
	6	2.0	3.5	45.4
	7	1.7	3.0	48.4
	8	1.6	2.9	51.2
	9	1.5	2.7	53.9
	10	1.4	2.6	56.5
	11	1.2	2.1	58.6
	12	1.1	2.0	60.6
	13	1.1	1.9	62.5
	14	1.1	1.9	64.4

at -5 produced the most interpretable factors (see Appendix F). The nine factors were named Self-Regulated Learning Efficacy Factor (SLEF), Self-Regulatory Efficacy Factor(SREF), Hard Sciences Achievement Efficacy Factor(HSEF), Leisure Time Skills Efficacy Factor(LSEF),

Self-Assertive Efficacy Factor(SAEF), Soft Sciences

Achievement Efficacy Factor(SSEF), Enlisting Parental and

Community Support Efficacy Factor(ESEF), Meet Others'

Expectation Efficacy Factor (MEEF), and Extracurricular

Activities Efficacy Factor(EAEF). The summary of the

rotated nine factors is reported in Table 4.

Table 4

Variance Associated with the MSES Rotated Factors (N=651)

Measure	Factor	Eigenvalue	% of Variance	Cum %
MSES	SLEF	10.8	19.0	19.0
	SREF	3.4	6.0	25.0
	HSEF	3.0	5.2	30.2
	LSEF	2.4	.2	34.4
	SAEF	1.9	3.4	37.8
	SSEF	1.6	2.8	40.6
	ESEF	1.2	2.1	42.7
	MEEF	1.1	2.0	44.7
	EAEF	1.0	1.7	46.4

Factor Analysis on the SES

A factor analysis was performed to respond to research question 2,

"What are the structural dimensions of the generalized Self-Efficacy Scales with a college population?".

Initially, 5 factors with eigenvalues greater than 1.0 were extracted by performing principal axis factor analysis on the correlations of the 23 items. Those 5 factors accounted for approximately 50% of the total variance. The 5 factors initially extracted are summarized in Table 5. A visual inspection of the scree plot suggested that two to five factors may represent the factor structure of the self-efficacy scales more accurately (see Appendix I). Each number of the factor solution, from two to five, was first

Table 5

Variance Associated with the SES Initial 5 Factors (N=651)

Measure	Factor	Eigenvalue	% of Variance	Cum %
SES	1	5.9	25.7	25.7
	2	1.9	8.1	33.8
	3	1.4	6.2	40.0
	4	1.2	5.2	45.2
	5	1.0	4.4	49.6

rotated orthogonally. Varimax rotation was utilized for the orthogonal solution. Following orthogonal rotation, each factor solution was also obliquely rotated, from most oblique (delta=0) to least oblique (delta=-5), utilizing oblimin rotation. All solutions were evaluated for each factor solution. Kaiser's eigenvalue greater than 1, Cattell's scree test, the amount of total variance accounted for, the number of items loading on each factor, and the theoretical considerations were used to compare the various solutions. A two-factor model, almost identical to the theoretical structure proposed by Sherer et al. (1982), was considered to be the best. Oblimin rotation with delta set at 0 produced the most interpretable factors (see Appendix G). The two factors were named General Efficacy Factor (GEF), and Social Efficacy Factor (SEF). The summary of the two rotated factors are reported in Table 6.

Table 6

Variance Associated with the SES Rotated Factors (N=651)

Measure	Factor	Eigenvalue	% of Variance	Cum %
SES	GEF	5.2	22.7	22.7
	SEF	1.2	5.3	28.0

Correlations between the Two Sets of Factors

Correlation coefficients were observed between the MSES factor scores and the SES factor scores to provide response to research question 3,

"How does a multidimensional self-efficacy score relates to a generalized one?".

The results are summarized in Table 7. The coefficients were small to large, ranging from .02 to .54. Sixteen of the 18 coefficients were statistically significant with alpha set at .01. The SAEF factor of the MSES was more strongly related to the general efficacy factor of the SES than other factors. The MEEF was more strongly related to the social efficacy factor of the SES. In addition, multiple correlation coefficients were observed by regressing the nine MSES factor scores on the general efficacy factor score (R =.63) and on the social efficacy factor score (R =.67). The nine factor scores of the MSES and the two factor scores of the SES obtained from the final solutions were saved and used for subsequent analyses.

A series of analyses were conducted to provide response to research question 4,

"What are the relationships between the dimensions of self-efficacy and dimensions of sex role orientation?".

The analyses to be reported in response to this question include a canonical correlational analysis, a series of multiple regressions, and examination of zero-order

correlation coefficients.

Table 7

Correlations Between MSES Factor Scores and SES Factor Scores (N=651)

MSES	SES	
	GEF	SEF
SLEF	.36**	.08
SREF	.12**	-.02
HSEF	-.35**	-.13**
LSEF	.39**	.35**
SAEF	.43**	.45**
SSEF	.26**	.15**
ESEF	.27**	.28**
MEEF	.35**	.54**
EAEF	.14**	.37**
	R=.63	R=.67

** p < .01

Canonical Correlation Analyses

The results of a canonical correlation analysis of MSES factors and four sex role subscales are presented in Table 8. Two pairs of canonical covariates were found to be statistically significant with alpha set at .05. The canonical correlation for the first pair was .72, and the

Table 8

Standardized Coefficients and Structure Matrix of the Two Canonical Functions(MSES with Sex role Measures)

Variable	Function 1		Function 2	
	Weights	Loadings	Weights	Loadings
MSES				
SLEF	.03	−.19	−.05	−.25
SREF	−.01	−.07	−.26	−.38
HSEF	.14	.35	−.21	−.20
LSEF	−.56	−.79	.17	−.00
SAEF	−.54	−.78	.44	.13
SSEF	−.00	−.28	−.07	−.23
ESEF	.02	−.34	−.61	−.71
MEEF	−.16	−.50	−.32	−.52
EAEF	−.06	−.34	−.41	−.43

Redundancy Coefficient = .11 (F1)

.04 (F2)

SEX ROLE

BSRIM	-.73	-.94	.42	.25
BSRIF	-.05	-.11	-.89	-.95
PAQM	-.31	-.82	-.31	-.17
PAQF	-.25	-.23	-.15	-.76

Redundancy Coefficient = .21 (F1)

.10 (F2)

Can Corr Coe	.72	.50
Squared Can Corr	.52	.25
Canonical Root	1.07	.34

canonical correlation for the second pair was .50. As can be seen in Table 8, the first pair of canonical covariates mainly reflected masculine attributes, and the second canonical pair reflected mainly feminine attributes. The redundancy coefficient for the MSES factor scores reflected that about 15 % of the variance of the self-efficacy scores is related to the sex role measures. Similarly, approximately 31% of the variance of the sex role measures can be accounted for by this relationship.

The summary of a canonical correlation analysis of SES factors and the four sex role subscales is shown in Table 9. Two pairs of canonical covariates were found to be statistically significant with alpha set at .05. The

canonical correlation for the first pair was .71, and the canonical correlation for the second pair was .27. The first pair of canonical covariate mainly reflected masculine attributes, and the second canonical pair mainly reflected feminine attributes. The redundancy coefficient for the SES factor scores indicated that about 40% of the variance in the self-efficacy scores is related to the sex role measures. Similarly, approximately 73% of the variance in the sex role measures can be accounted for by self-efficacy measures.

Based on canonical correlational analyses, substantial overlap between sex role measures and self-efficacy measures are suggested. In order to further explicate the relationship of the self-efficacy factor scores to sex role, a series of multiple regression analyses were performed.

Table 9

Standardized Coefficients and Structure Matrix of the Two

Canonical Functions(SES with Sex Role Measures)

Variable	Function 1		Function 2	
	Weights	Loadings	Weights	Loadings
SES				
GEF	.77	.96	-.94	-.28
SEF	.34	.78	1.16	.63
		Redundancy Coefficient = .39 (F1)		
			.02 (F2)	
SEX ROLE				
BSRIM	.29	.79	.36	-.16
BSRIF	.05	.10	-.21	.61
PAQM	.73	.92	-.65	-.37
PAQF	.32	.31	1.05	.90
		Redundancy Coefficient = .39 (F1)		
			.34 (F2)	
Can Corr Coe	.71		.27	
Squared Can Corr	.51		.08	
Canonical Root	1.03		.08	

Multiple Regression

The relationships between the dimensions of self-efficacy and dimensions of sex role orientation were examined via multiple regressions. The MSES factor scores and the SES factor scores were regressed on the subscales of both the BSRI and the PAQ.

Multiple Regression of MSES Factor Scores on BSRI

The first regression equation was obtained by regressing the MSES nine factor scores on the BSRI masculinity scores with forced entry. The regression equation with all the variables entered was significant at .01 alpha level with approximately 47% of the variance in the BSRIM accounted for. As is shown in Table 10, the SLEF and the LSEF made major contributions to the BSRI masculinity. The two predictors accounted for about 45% of the variance in BSRI masculinity.

The second equation was obtained by regressing the MSES nine factor scores on the BSRI femininity scores. The equation with nine factors entered was significant at .01 level, and about 23% of the variance in BSRIF was accounted for by these factors. Two factors, the ESEF and the EAEF, accounted for about 17% of the variance in the BSRIF. The results are reported in Table 10.

Multiple Regression of MSES Factor Scores on PAQ

The results of the regression of the MSES factor scores on PAQ subscale scores are summarized in Table 11. The

pattern of the equations obtained from regressing the factor

scores on the PAQ subscales was very similar to the results

obtained from the regressions of factor scores on the BSRI

subscale scores. The equations observed from the regression

of MSES factor scores on the PAQM and on the PAQF were also

significant at .01 alpha level. LSEF and SAEF were the

contributing variables in predicting PAQM, whereas MEEF and

EAEF were the important variables in predicting PAQF.

Table 10

Multiple Regression of MSES 9 Factor Scores on BSRI (N=651)

Factors	R	Rsq	F(eqn)	RsqCh	F(Ch)	r
			Criterion:BSRIM			
SAEF	.55	.30	276.62**	.30	276.62**	.55**
LSEF	.67	.45	267.40**	.15	181.33**	.53**
HSEF	.68	.46	184.23**	.01	10.24**	-.25**
ESEF	.68	.47	140.86**	.01	6.26*	.14**
SREF	.68	.47	113.08**	.00	1.54	-.01
MEEF	.68	.47	94.54**	.00	1.44	.25**
SLEF	.69	.47	81.26**	.00	1.30	.08*
SSEF	.69	.47	71.03**	.00	.17	.18**
EAEF	.69	.47	63.04**	.00	.01	.19**
			Criterion:BSRIF			
ESEF	.37	.13	100.15**	.13	100.15**	.37**
EAEF	.42	.17	68.02**	.04	31.24**	.26**
SAEF	.44	.19	52.12**	.02	16.97**	.01
MEEF	.46	.21	43.20**	.02	13.42**	.27**
SREF	.47	.22	36.77**	.01	8.95**	.16**
HSEF	.48	.23	32.16**	.01	7.31**	.08*
SSEF	.48	.23	27.92**	.00	2.12	.15**
LSEF	.48	.23	24.51**	.00	.72	.06
SLEF	.48	.23	21.75**	.00	.01	.12**

* p<.05, ** p<.01

Table 11

<u>Multiple Regression of MSES 9 Factor Scores on PAQ (N=651)</u>

Factors	R	Rsq	F(eqn)	RsqCh	F(Ch)	r
			Criterion:PAQM			
LSEF	.50	.25	215.10**	.25	215.10**	.50**
SAEF	.59	.35	171.24**	.10	95.92**	.44**
HSEF	.60	.36	120.15**	.01	12.09**	-.24**
EAEF	.60	.36	92.16**	.01	5.62*	.09*
MEEF	.61	.37	74.95**	.00	4.24*	.27**
ESEF	.61	.37	62.94**	.00	2.22	.15**
SLEF	.61	.37	53.99**	.00	.55	.14**
SREF	.61	.37	47.24**	.00	.35	.06
SSEF	.61	.37	41.94**	.00	.09	.14**
			Criterion:PAQF			
MEEF	.31	.10	70.97**	.10	70.97**	.31**
EAEF	.38	.15	55.73**	.05	36.59**	.28**
ESEF	.42	.18	45.73**	.08	22.12**	.30**
SREF	.43	.18	36.00**	.01	5.79*	.13**
LSEF	.43	.19	29.46**	.00	2.87	.08*
SAEF	.43	.19	24.89**	.00	1.82	.11**
SSEF	.43	.19	21.43**	.00	.73	.10*
HSEF	.44	.19	18.76**	.00	.27	.01
SLEF	.44	.19	16.66**	.00	.09	.09*

* p<.05, **p<.01

Multiple Regression of the SES factors on BSRI

The results of the regression of the two SES factor scores on the BSRI subscale scores are shown in Table 12. The equation obtained from the regression of the SES factor scores on BSRIM was significant at .01 alpha level. The GEF accounted for about 30% of the variance in BSRIM. Similarly, the regression equation of the SES factor scores on the BSRIF subscale scores was significant with alpha set at .01 level. However, only about 3% of the total variance in BSRI femininity scores was accounted for by the SES.

Multiple Regression of the SES Factor Scores on PAQ

The summary of the regression of the SES factor scores on PAQ subscale scores is presented in Table 13. The regression equation of the SES factor scores on the PAQM was statistically significant at .01 alpha level. The GEF explained approximately 43% of the variance in the PAQ masculinity, and the contribution of the SEF factor to the total variance accounted for in PAQ masculinity was negligible. The equation obtained from the regression of the SES factor scores on the PAQF was also statistically significant with alpha set at .01. The total amount of variance explained by the two factors was approximately 11%, for which the SEF factor accounted for about 11%.

Table 12

Multiple Regression of SES 2 Factor Scores on BSRI (N=651)

Factors	R	Rsq	F(eqn)	RsqCh	F(Ch)	r
			Criterion:BSRIM			
GEF	.55	.30	282.62**	.30	282.62**	.55**
SEF	.56	.32	150.46**	.01	13.05**	.41**
			Criterion:BSRIF			
SEF	.16	.03	17.58**	.03	17.58**	.16**
GEF	.18	.03	11.14**	.00	4.61*	.02

* p<.05, ** p<.01

Table 13

Multiple Regression of SES 2 Factor Scores on PAQ (N=651)

Factors	R	Rsq	F(eqn)	RsqCh	F(Ch)	r
			Criterion:PAQM			
GEF	.66	.43	489.30**	.43	489.30**	.66**
SEF	.66	.44	252.05**	.01	8.86**	.44**
			Criterion:PAQF			
SEF	.33	.11	78.46**	.11	78.46**	.33**
GEF	.33	.11	40.21**	.00	1.85	.14**

* p< .05, ** p<.01

<u>Zero-Order Correlations</u>

Table 14 was constructed to provide a comparison of the zero-order correlations of the self-efficacy factor scores with masculinity to the same correlations with femininity. Table 14 lists these pairs of correlations, first for the BSRI, and then for the PAQ. Also the results of t-tests between these pairs of correlations are provided in the table (Note [1]). The results, as can be seen in Table 14, revealed a tendency for self-efficacy to have significantly greater relationship with masculinity than femininity. Specific results can be seen from the Table.

Table 14

A comparison of Masculine and Feminine Correlations (N=651)

	BSRIM	BSRIF		PAQM	PAQF	
	r	r	t	r	r	t
SLEF	.08	.12	.71	.14	.09	.90
SREF	-.01	.16	3.01**	.06	.13	1.26
HSEF	-.25	.08	5.97**	-.24	.01	4.59**
LSEF	.53	.06	-9.73**	.50	.08	-8.69**
SAEF	.55	.01	-11.32**	.44	.11	-6.61**
SSEF	.18	.15	-.54	.14	.10	-.72
ESEF	.14	.37	4.40**	.15	.30	2.84**
MEEF	.25	.27	.38	.27	.31	.78
EAEF	.19	.26	1.30	.09	.28	2.62**
GEF	.55	.02	-11.12**	.66	.14	-12.60**
SEF	.41	.16	-4.89**	.44	.33	-2.36*

Note. A special formula for t-test for the significance of difference between correlation coefficients when samples are not independent was used (Klugh, 1970).

*p<.05 , **p<.01

Procedural analyses

Given the relationship between sex role and gender, questions arose during the conduct of this study regarding sex differences on variables included in prior analyses. Several analyses were performed to investigate potential sex differences with these results. The analyses included discriminant function analysis and multiple regression analyses.

Discriminant Function analysis

In order to examine sex differences in the relationships between the dimensions of self-efficacy and dimensions of sex role orientation, a two-group discriminant function analysis with the direct method was performed. The MSES nine factor scores and the SES two factor scores were treated as the independent variables. The classification variable was gender. The means and standard deviations of the 11 variables are shown in Table 15 along with the standardized canonical discriminant function coefficients, and the structure matrix.

One discriminant function was derived and was significant (Wilks' lambda=.67, p<.01). The loadings on the structure matrix indicated that LSEF, SAEF, MEEF, and EAEF seem to define the observed significant discriminant function. The overall hit ratio was approximately 77%, indicating that the observed discriminant function has relatively high predictive accuracy.

Table 15

Two-group Discriminant Analysis of 15 Variables

Variables	Weights	Loadings	Means & Standard Deviations	
			Males	Females
SLEF	.28	.20	-.13(.95)	.12(.91)
SREF	.38	.28	-.18(1.06)	.18(.75)
HSEF	.19	.20	-.14(.94)	.13(.96)
LSEF	-.59	-.32	.21(.87)	-.21(1.01)
SAEF	-.51	-.23	.14(.88)	-.14(.92)
SSEF	.10	.14	-.09(.89)	.09(.88)
ESEF	.27	.27	-.17(.91)	.17(.87)
MEEF	.40	.31	-.19(.86)	.19(.89)
EAEF	.59	.38	-.23(.85)	.22(.84)
GEF	-.29	-.15	.10(.91)	-.10(.94)
SEF	.20	.08	-.05(.90)	.05(.85)

Canonical Discriminant Function 1: Eigenvalue   =   .48

Canonical Corr =   .57

Wilks' Lambda   =   .67

Chi Square(11df)= 253.44

p   =.00001

Percent of cases correctly classified: Males   = 79 %
Females = 76 %
Overall = 77 %

Multiple Regression by Gender

In order to further explicate sex differences the MSES factor scores and the SES factor scores were regressed on the subscales of both the BSRI and the PAQ for each gender group.

Multiple Regressions of MSES 9 factor scores on BSRIM

As can be seen in Table 16, the multiple regression of the MSES factor scores of males on the BSRIM generated a significant equation to which SAEF and LSEF were the most significant contributors. A similar pattern emerged from the multiple regression of the MSES factors scores of females on BSRIM. The same factors, SAEF and LSEF, were the defining variables in the equation. Both SAEF and LSEF accounted for about 42% of the variance in BSRIM for both gender groups.

Multiple Regression of MSES 9 Factor Scores on BSRIF

Table 17 shows that the regression of the nine factor scores of males and females on the BSRIF were significant at .01 alpha level. For males, ESEF and EAEF were the most significant variables, whereas ESEF and SREF were the most significant variables for females. Approximately 15% of the total variance in BSRIF was explained for males and 21% for females.

Table 16

Multiple Regression of MSES 9 Factor Scores on BSRIM

Factors	R	Rsq	F(eqn)	RsqCh	F(Ch)	r
			Group: Males			
SAEF	.53	.28	125.01**	.28	125.01**	.53**
LSEF	.65	.42	116.24**	.14	77.50**	.49**
SSEF	.66	.43	79.65**	.01	4.15*	.26**
MEEF	.66	.43	60.40**	.00	1.94*	.43**
HSEF	.66	.43	48.49**	.00	.92	-.19**
SLEF	.66	.44	40.71**	.00	1.45	.14*
EAEF	.66	.44	34.82**	.00	.16	.27**
SREF	.66	.44	30.38**	.00	.03	.04
ESEF	.66	.44	26.92**	.00	.00	.27**
			Group: Females			
SAEF	.53	.28	129.70**	.28	129.70**	.53**
LSEF	.65	.42	120.74**	.14	80.39**	.51**
HSEF	.66	.44	83.80**	.01	6.13*	-.23**
EAEF	.67	.44	64.70**	.01	4.62*	.32**
ESEF	.67	.45	52.48**	.00	2.44	.15**
MEEF	.67	.45	44.61**	.01	3.35	.27**
SSEF	.67	.45	38.25**	.00	.51	.18**
SLEF	.67	.45	33.41**	.00	.19	.14*
SREF	.67	.45	29.64**	.00	.17	.06

* p<.05, ** p<.01

Table 17

Multiple Regression of MSES 9 Factor Scores on BSRIF

Factors	R	Rsq	F(eqn)	RsqCh	F(Ch)	r
Group: Males						
ESEF	.28	.08	26.52**	.08	26.52**	.28**
EAEF	.35	.12	21.84**	.04	15.91**	.27**
LSEF	.38	.14	17.51**	.02	7.91**	.27**
SSEF	.38	.14	13.32**	.00	.79	.08
HSEF	.38	.15	10.70**	.00	.34	-.02
SAEF	.38	.15	8.94**	.00	.23	.13*
MEEF	.38	.15	7.67**	.00	.23	.21**
SREF	.38	.15	6.70**	.00	.07	.00
SLEF	.38	.15	5.94**	.00	.04	.08
Group: Females						
ESEF	.38	.14	54.54**	.14	54.54**	.38**
SREF	.41	.17	33.08**	.03	10.10**	.24**
HSEF	.43	.18	23.98**	.01	4.97*	.06
SSEF	.44	.19	19.36**	.01	4.69*	.16**
SAEF	.45	.20	16.20**	.01	3.08	.05
SLEF	.45	.21	13.99**	.01	2.53	.05
EAEF	.46	.21	12.33**	.00	2.08	.04
MEEF	.46	.21	10.99**	.00	1.49	.19**
LSEF	.46	.21	9.77**	.00	.23	.11*

* p<.05, ** p<.01

Multiple Regression of MSES 9 Factor Scores on PAQM

The summary of the results is shown in Table 18. The patterns in the two significant equations from multiple regressions of the nine factors on the PAQM were essentially identical to the patterns in the regression of the factors on the BSRIM. The same variables, LSEF and SAEF, explained about 35% of the variance in PAQM for both gender groups.

Multiple Regression of MSES 9 Factor Scores on PAQF

The regression equation of MSES factor scores on PAQF for males was statistically significant. As can be seen in Table 19, approximately 14% of the total variance in sex role orientation was accounted for by the nine factors. The MEEF was the contributing factor to this equation. Likewise, the statistically significant regression equation for females revealed that about 14% of the total variance in sex role orientation can be explained by the nine factors. For females, the ESEF was the contributing factor to the significant equation.

Table 18

Multiple Regression of MSES 9 Factor Scores on PAQM

Factors	R	Rsq	F(eqn)	RsqCh	F(Ch)	r
			Group: Males			
LSEF	.48	.23	95.40**	.23	95.40**	.48**
SAEF	.57	.32	75.53**	.09	43.08**	.41**
SREF	.58	.33	52.78**	.01	5.26*	.14*
MEEF	.59	.34	41.51**	.01	5.48*	.42**
EAEF	.59	.35	33.62**	.00	1.70	.14*
ESEF	.59	.35	28.40**	.00	1.85	.31**
HSEF	.60	.35	24.53**	.00	1.19	−.18**
SSEF	.60	.35	21.42**	.00	.11	.19**
SLEF	.60	.35	18.98**	.00	.00	.18**
			Group: Females			
LSEF	.46	.21	86.01**	.21	86.01**	.46**
SAEF	.55	.30	71.54**	.09	45.43**	.42**
HSEF	.57	.32	51.80**	.02	8.87**	−.24**
MEEF	.58	.34	41.40**	.02	7.24**	.30**
ESEF	.59	.35	34.24**	.01	4.04*	.14**
SLEF	.59	.35	29.43**	.00	3.87*	.21**
SSEF	.59	.35	25.17**	.00	.11	.17**
EAEF	.60	.35	21.99**	.00	.15	.21**
SREF	.60	.35	19.50**	.00	.11	.12*

* p<.05, ** p<.01

Table 19

Multiple Regression of MSES 9 Factor Scores on PAQF

Factors	R	Rsq	F(eqn)	RsqCh	F(Ch)	r
			Group: Males			
MEEF	.28	.08	26.29**	.08	26.29**	.28**
EAEF	.34	.11	20.62**	.03	13.88**	.26**
LSEF	.35	.12	14.79**	.01	2.89**	.23**
SSEF	.36	.13	11.97**	.01	3.21	.02
ESEF	.37	.14	9.94**	.01	1.71	.20**
HSEF	.37	.14	8.55**	.00	1.52	-.08
SLEF	.38	.14	7.40**	.00	.56	.04
SREF	.38	.14	6.52**	.00	.43	.03
SAEF	.38	.14	5.80**	.00	.23	.20**
			Group: Females			
ESEF	.31	.10	34.42**	.10	34.42**	.31**
EAEF	.34	.12	21.91**	.02	8.61**	.16**
MEEF	.37	.13	16.70**	.01	5.65*	.24**
SREF	.37	.14	12.83**	.00	1.17	.12*
SLEF	.37	.14	10.43**	.00	.86	.05
SSEF	.37	.14	8.75**	.00	.44	.12*
HSEF	.38	.14	7.57**	.00	.57	-.01
SAEF	.38	.14	6.60**	.00	.01	.17**
LSEF	.38	.14	5.85**	.00	.01	.12*

* p<.05, ** p<.01

<u>Multiple Regression of SES factor scores on BSRIM</u>

As is shown in Table 20, the GEF was the most substantial variable in the equations for both gender groups. Approximately 29% was accounted for by the GEF for males, and 34% for females. The contribution of SEF to the equations was negligible for both groups.

Table 20

<u>Multiple Regression of SES 2 Factor Scores on BSRIM</u>

Factors	R	Rsq	F(eqn)	RsqCh	F(Ch)	r
			Group: Males			
GEF	.54	.29	131.96**	.29	131.96**	.54**
SEF	.56	.32	73.17**	.03	10.47**	.43**
			Group: Females			
GEF	.56	.31	147.44**	.31	147.44**	.56**
SEF	.59	.34	85.05**	.03	15.95**	.47**

** $p < .01$

Multiple Regression of SES factor scores on BSRIF

Although statistically significant, the amount of variance in BSRIF accounted for by SEF or GEF was not substantial for either gender. Only about 4% and 2% of the variance in BSRIF was explained by the two factor scores for males and females, respectively. The results are summarized in Table 21.

Table 21

Multiple Regression of SES 2 Factor Scores on BSRIF

Factors	R	Rsq	F(eqn)	RsqCh	F(Ch)	r
			Group: Males			
SEF	.19	.03	11.64**	.03	11.64**	.19**
GEF	.20	.04	6.83*	.01	1.99	.04
			Group: Females			
GEF	.12	.02	5.18*	.02	5.18*	.13*
SEF	.13	.02	3.02*	.00	.87	.11*

* p<.01, ** p<.01

Multiple Regression of SES factor scores on PAQM

The regression equations of the SES factor scores on the PAQM scores indicated that the GEF is the major variable in predicting PAQ masculinity for both genders. The results shown in Table 22 indicate that the GEF accounted for about 47% of the total variance in sex role orientation for males, and about 40% for females.

Table 22

Multiple Regression of SES 2 Factor Scores on PAQM

Factors	R	Rsq	F(eqn)	RsqCh	F(Ch)	r
			Group: Males			
GEF	.69	.47	219.87**	.47	219.87**	.69**
SEF	.70	.48	118.85**	.01	11.08**	.48**
			Group: Females			
GEF	.63	.40	283.61**	.40	283.61**	.63**
SEF	.65	.42	149.15**	.02	8.25**	.48**

p<.05, ** p<.01

Multiple Regression of SES 2 Factor Scores on PAQF

The analysis results are summarized in Table 23. The two equations for both gender groups are statistically significant with alpha set at .01. SEF was the major factor that contributed to the significance of the equations. Approximately 12% of the total variance in sex role orientation was explained by the SEF and the GEF factors for the males, and about 10% for the females.

Table 23

Multiple Regression of SES 2 Factor Scores on PAQF

Factors	R	Rsq	F(eqn)	Rsq	F(Ch)	r
			Group: Males			
SEF	.35	.12	44.69**	.12	44.69**	.35**
GEF	.35	.12	22.29*	.00	.03	.19**
			Group: Females			
SEF	.31	.10	35.17*	.10	35.17*	.31**
GEF	.31	.10	17.70*	.00	.30	.21*

* p<.05, ** p<.01

CHAPTER V

DISCUSSION

A summary of major findings, discussion of results,
limitations, recommendations, and conclusions are presented
in this chapter. The summary of major findings includes
synopses of key findings for the four research questions and
for sex differences. The discussion of results contain
discussions of the measurement of self-efficacy, the
relationship between self-efficacy and sex role orientation,
theoretical implications, and social implications of this
study. Following the discussion, limitations,
recommendations, and conclusions are presented.

Summary of Major Findings

Research Question 1

A solution to research question 1 "What are the
structural dimensions of the Multidimensional Self-Efficacy
Scales (MSES) with a college population?", was found by
performing a factor analysis of the MSES. A nine-factor
oblique solution with delta set at -5 was determined to best
reflect the structural dimensions of the multidimensional
scale. This nine-factor solution resembled the original
nine-dimensional structure theorized by Bandura (1989) with
exceptions. Four subscales (self-efficacy for self-
regulated learning subscale, self-regulatory efficacy

subscale, self-efficacy for enlisting parental community support subscale, and self-assertive efficacy subscale) were each reproduced by a corresponding, single factor (self-regulated learning efficacy factor, self-regulatory efficacy factor, enlisting parental and community support efficacy factor, and self-assertive efficacy factor). Items from three subscales (self-efficacy to meet others' expectations subscale, social self-efficacy subscale, and self-efficacy in enlisting social resources subscale) were represented by one of the obtained factors (meet others' expectation efficacy factor). The remaining two subscales (self-efficacy for academic achievement subscale and self-efficacy for leisure time skills and extracurricular activities subscale) were represented in pairs on four factors (hard sciences learning efficacy factor, soft sciences efficacy factor, leisure time skills efficacy factor, and extracurricular activities efficacy factor). The intercorrelations among the nine factors ranged from .00 to .31. Overall, the nine factors explained approximately 46% of the total variance based on the sample of this study. Although the factor solution was somewhat similar to the proposed structure, questions arose as to validity of the structural dimensions of the instrument. One point is that despite the fact that all the subscales were represented by factors, they were reorganized. The second point is that the 46% of the variance explained by the nine factors is low

not only by conventional standards but relative to the results obtained from a previous study (Williams et al., 1996) where about 92% of the total variance was accounted for.

Research Question 2

A solution to research question 2 "What are the structural dimensions of the generalized Self-Efficacy Scales (SES) with a college population?", was also found by utilizing a factor analysis of the SES. A two-factor oblique solution with delta set at 0 was retained for interpretation and for further investigation. Twenty-two of the 23 items loaded on their proposed factors; 16 items on the general efficacy factor and 6 items on the social efficacy factor. Thus, the two-factor solution closely matched the hypothesized structure of generalized self-efficacy proposed by Sherer et al. (1982). The two factors were highly correlated (r=.47). However, the percentage of the variance accounted for (28%) by the two factors and low internal consistency reliability of the general efficacy subscale found in this study suggested a question concerning the construct validity of the SES. Perhaps these questions are most related to the number of dimensions included.

Research Question 3

In order to answer research question 3, "How does a multidimensional self-efficacy scale relate to a generalized self-efficacy scale?", the correlations between the two sets

of factor scores were examined. Although most correlations were statistically significant, the leisure time skills factor and the self-assertive efficacy factor were most strongly related to the general efficacy factor of the SES. The meet others' expectation efficacy factor, extracurricular activities efficacy factor, and self-assertive efficacy factor, on the other hand, were more strongly related to the social efficacy factor of the SES. The obtained multiple correlation coefficients further indicated that about 39% of the variance in the general self-efficacy factor scores, and about 45% of the variance in the social self-efficacy factor scores can be predicted by the nine factor scores of the MSES. Thus, there seems to be a fair amount of redundancy in measurement of self-efficacy.

Research Question 4

Solutions to research question 4, "What are the relationships between the dimensions of self-efficacy and dimensions of sex-role orientation?", were obtained through canonical correlation analyses, multiple regressions, and zero-order correlations. The results of the canonical analyses showed statistically significant relationships between sex role measures and self-efficacy measures. The observed canonical correlation coefficient between the nine MSES factor scores and the four sex role subscale scores (BSRIM, BSRIF, PAQM, PAQF) was .72. The observed canonical

correlation coefficient between the two SES factor scores
and the four sex role subscale scores was .71. More
specifically, the first covariate reflected mainly masculine
attributes, and the second covariate reflected mainly
feminine attributes. The trend was similar across the self-
efficacy measures. The redundancy coefficients further
indicated that approximately 15% to 73% of the variance in
the sex role orientation scores can be explained by self-
efficacy factor scores.

Based on the results of canonical analyses, the
relationships between sex role orientation scores and self-
efficacy scores were further investigated using multiple
regressions. The nine MSES factor scores were regressed on
each of the four sex role subscale scores, and the two SES
factors were regressed on the same subscale scores. All the
obtained regression equations were statistically significant
with alpha set at .01.

The regression equations of the MSES factor scores on
the four subscale scores indicated that the three factors,
self-assertive efficacy factor, leisure time skills efficacy
factor, and hard sciences efficacy factor, were the most
important predictors of masculine attributes measured by the
BSRIM or the PAQM. The leisure time skills efficacy factor
exhibits efficacy in learning individual sports skills or
team sports skills. The self-assertive efficacy factor
reveals efficacy in standing up for oneself in an unpleasant

situation. The hard sciences efficacy factor is efficacy in
learning math and science subject matters. These three
factors represent masculine attributes, such as
competitiveness and assertiveness. Approximately 46% of the
total variance in the BSRIM, and about 36% of the variance
in the PAQM were accounted for by these three factors.

In contrast, enlisting parental and community support
efficacy factor, extracurricular activities efficacy factor,
and social efficacy factor were the most important factors
in predicting feminine attributes as measured by the BSRIF
or the PAQF. The social efficacy factor indicates efficacy
in dealing with people and meeting others' expectations.
The extracurricular activities efficacy factor exhibits
efficacy in learning dance and music skills. The enlisting
social resources efficacy factor reflects efficacy in
getting help from family members and friends. These factors
basically represent social and interpersonal skills. While
the relationship of self-efficacy and femininity is
significant, these three feminine factors explained less
than 20% of the total variance in self-efficacy. Compared
to the amount of variance explained by masculine factors
(about 47% by the BSRIM and about 36% by the PAQM), far less
variance in self-efficacy is accounted for by the BSRIF or
the PAQF.

The regression equations of the SES factor scores on
the sex role subscale scores revealed that the general

efficacy factor was the defining predictor of masculinity. The squared multiple correlation coefficients indicated that approximately 30% of the variance in the BSRIM and approximately 43% in the PAQM were explained by the GEF. In contrast, the social efficacy factor was the prominent factor in predicting femininity. Although the equations and the increment in R squared were statistically significant, only about 3% of the variance in BSRIF and about 11% of the variance in the PAQF were accounted for by the social factor.

Subsequent to the multiple regressions, t-tests for the significance of difference between zero-order correlation coefficients were obtained in order to compare masculine and feminine correlations. The correlations between self-efficacy factors and masculinity tended to be greater than the correlations between self-efficacy and femininity.

Sex Differences

In order to explicate whether or not there are any sex differences in the relationships between the dimensions of self-efficacy and dimensions of sex role orientation, procedural analyses were conducted using discriminant function analysis and multiple regression analyses. The MSES factor scores and the SES factor scores served as predictors to discriminate the participants in terms of sex. The observed Chi Square value (350.914 with 11 df, p<.00001) and the overall hit ratio (77%) suggested that the

discriminant function derived from the 11 variables
reasonably well classified the participants into the correct
sex group. Of the 11 variables, the leisure factor and the
extracurricular factor were the most significant variables
in predicting sex differences.

However, when sex differences were examined by
regression coefficients obtained from males and females, the
same factors accounted for the variability in sex role
orientation for both gender groups. For example, the self-
assertive factor and the leisure factor of the MSES were the
two most important predictors of masculinity, whether
exhibited by males or females, measured by the BSRIM or the
PAQM. On the other hand, the enlisting resources factor and
the extracurricular factor were the most significant
predictors of femininity, regardless of gender, measured by
the BSRIF or the PAQF. When masculinity was predicted by
the SES scale, the general self-efficacy factor accounted
for a substantial amount of variance in masculinity for both
groups. When femininity was predicted by the SES scale, the
social self-efficacy factor explained the largest amount of
variance in femininity for both groups.

Considering the results of the discriminant function
analysis, there seems to be a small degree of sex difference
in self-efficacy. However, there appears to be far greater
differences in masculinity and femininity in terms of their
relation to self-efficacy. That is, regardless of

biological gender, a person who scores high on the masculine dimension tends to score high on self-efficacy scales, and a person who scores high on the feminine dimension tends to score low on self-efficacy scales.

Discussion of Results

Measurement of Self-Efficacy

This study reasonably replicates the dimensional structure of the MSES and the SES that were found in the studies of Sherer et al. (1982) and Williams et al. (1996). Large sample may have aided in obtaining this result. Nevertheless, the extent to which the dimensionality effectively operationalizes the theoretical construct of self-efficacy is another question. The results, as they directly or indirectly relate to the validity of the dimensions of the construct, are discussed.

Multidimensional Self-Efficacy Scales

The factor solution to the MSES retained in this study is comparable to the nine-factor structure proposed by Bandura (1989). This is consistent with the results reported in the validity study of Williams et al. (1996), in which a nine-factor solution was also obtained. A comparison of the factor structure obtained from the current study and that of Williams et al. (1996) reveals that the two factor structures are similar. Items loading on each factor were similar in both studies. For example, items that asked "How well can you learn dance skills?" and "How

well can you learn music skills?" loaded on the same factor, and the factor was named self-efficacy for extracurricular activities in Williams et al. (1996) and extracurricular activities efficacy factor in the current study. Therefore, the proposed factor structure of the MSES was partially supported.

However, several findings from this study suggest that the original nine-dimensional structure of self-efficacy suggested by Bandura (1989) may be empirically, not theoretically, derived. One indicator of inaccurate dimensions is the reorganization of the dimensions of the MSES. In the current study four subscales, less than half of the original nine subscales, were replicated in their respective form in matching factors. The other five subscales were either divided into different factors or combined into one factor. This is also compatible with the findings of Williams et al. (1996) and the patterns shown in both studies point out that reconceptualization of self-efficacy dimensions is necessary to more closely approximate the true structure.

More specifically, the self-efficacy for leisure time skills and extracurricular activities subscale of the MSES split into two factors in both studies. These factors were leisure time skills factor and extracurricular activities efficacy factor in the current study; Williams et al. (1996) named them team sports factor and extracurricular efficacy

factor. Academic self-efficacy subscale is another example of the same case. This subscale also split into two factors in both studies. Both subscales, the leisure time skills factor and extracurricular activities subscale and academic efficacy subscale, have large number of items relative to the number of items of other subscales. Both consist of two related, but somewhat different content domains. This suggests that these two subscales may represent oversampling of items. This speculation is supported by the correlations between the leisure skills subscale and the two resulting factors from the subscale (r=.74 and r=.71). These two primary factors were later merged into a single second-order factor in the study of Williams et al. (1996).

Another example of potentially inaccurate dimensions is three subscales that merged into one factor in this study: the self-efficacy in enlisting social resources subscale, the self-efficacy to meet others' expectations subscale, and the social self-efficacy subscale. These three subscales have a small number of items (n=4) and appear to measure a similar construct with focus on how efficacious an individual is in dealing with people. These three subscales were represented by Williams et al. (1996) as two different factors: social self-efficacy and self-efficacy in seeking help.

A careful examination further suggests inappropriate item contents for the subscales. For instance, the four

items of the enlisting social resources subscale seem to measure social self-efficacy rather than measuring self-efficacy for enlisting social resources. These items basically ask a respondent how efficacious a person is getting help from teachers or friends when the person has learning or social problems. Considering the definition of self-efficacy, a belief that one can get necessary things done to achieve goals, getting help from people and doing things to achieve goals are not exactly the same. Getting help from people may reflect social self-efficacy. Not surprisingly, this subscale merged into meet others' expectation efficacy factor along with two other subscales. Possibly "flawed items are the major error source" (Crocker & Algina, 1986) of the low internal consistency reliability coefficient (.63) of this subscale.

It is evident that there is redundancy among the dimensions of the MSES. A domain misspecification may have contributed to the redundancy, which was indicated by substantial intercorrelations among 1) the nine factors, 2) the nine subscales, and 3) the nine original subscales and the nine factor scores. The three second-order factors derived in the study of Williams et al. (1996) further strengthens this speculation. The second-order factor solution in their study produced three higher-order factors; social efficacy, task management efficacy, and academic efficacy. The unsubstantiated nine-factor structure and the

findings of second-order factors demonstrate that the true

factor structure of self-efficacy may have less than nine

dimensions. A three second-order factor solution obtained

from preliminary second-order factor analyses of data from

this study also support this speculation.

<u>Self-Efficacy Scale</u>

Sherer et al. (1982) originally hypothesized that the

items in the general self-efficacy subscale would measure

the degree of an individual's self-efficacy built on the

individual's past experience of success and failure in a

variety of situations. The findings of the current study

tentatively support the two-factor structure of the Self-

Efficacy Scale (SES). However, some findings of this study,

such as the extremely low percentage (28%) of total variance

accounted for by the two factors indicate that the factor

structure of the SES needs further examination.

A close examination of the 17-item general self-

efficacy subscale shows that the items consist of broad

statements. That aspect seems to support the authors'

hypothesized construct, that is, general self-efficacy is a

internalized stable sense of self. Nevertheless, that very

aspect may also invalidate the measurement of general self-

efficacy. One of the major questions about the nature of a

psychological construct is its situational specificity. An

accurate assessment of self-efficacy requires specificity of

a task, such as type of a task, difficulty levels of a task,

and specificity of the environment where the task is performed (Bandura, 1986). Therefore, broad statements of how to act across situations may tap different constructs, such as personality and/or social desirability, as well. The size of the correlation between the general self-efficacy subscale scores with self-esteem scale (r=-.51) and with the social desirability scale (r=.43) reported by Sherer et al. (1982), supports this speculation. Therefore, in order to fully explicate the meaning of the construct, a wide range of situations will have to be employed in stimulating self-efficacy judgement.

One problem related to validity concerns the items on the social subscale. One is that five items out of the six on the social subscale deal with a person's perceived efficacy in interaction with friends. Friends are only one group of people that a person has to deal with, and other groups of people, such as parents, elders, teachers, etc, are not reflected in the subscale, thus eliminating a relevant domain of the construct. A range of specific relationship may have to be fully accounted for in defining this aspect of self-efficacy.

Another problem is related to the evidence of convergent validity. The social subscale showed greater correlation with masculinity subscales of the BSRI and the PAQ than femininity subscales. This is contrary to expectation considering that the social dimension of self-

efficacy is empirically, as well as theoretically, more related to femininity. A careful inspection of the six items suggests that those respondents who are self-assertive may respond positively on these items, because the items tend to reflect self-assertiveness. For instance, for a participant to respond positively to an item such as "When I'm trying to become friends with someone who seems unpleasant at first, I don't give up easily.", the participant may have to be assertive as well. That may explain why these items seem to measure a social dimension, but relate much more strongly to assertive or aggressive variables usually associated with masculinity.

The findings of this study suggest that the MSES and the SES are related to each other even though the measures were developed using different hypotheses. There is approximately 40% shared variance between the two measures, signifying that there is a considerable amount of measurement overlap. Furthermore, masculine factors of the MSES, such as leisure factor and assertive factor appear to be more related to general self-efficacy of the SES. Feminine factors of the MSES, such as meet others' expectation factor, on the other hand, are more related to social self-efficacy of the SES. This suggest that the SES may measure simply two domains of self-efficacy, but may not measure a generalized self-efficacy as it was intended.

Self-Efficacy and Sex Role Orientation

One of the major findings of the current study is that sex role orientation is substantially related to perceived self-efficacy. The patterns identified in the canonical correlational analyses indicate that masculine characteristics account for the first canonical variate. The second canonical variate centered around feminine characteristics. The two functions demonstrate that masculinity is a more important construct in predicting self-efficacy than femininity. The trend held true whether self-efficacy was measured by the domain-specific scales (MSES) or by the generalized self-efficacy scale (SES).

Another major finding of this study is that different dimensions of self-efficacy can be explained by different dimensions of sex role orientation. That is, factors such as leisure skills factor, self-assertive factor, and hard sciences factor account for more variability in masculinity. These factors are believed to be rather masculine due to their competitive, independent, and self-assertive characteristics. On the other hand, factors such as meet others' expectation efficacy factor, extracurricular factor, and enlisting resources factor are more strongly related to femininity. These factors represent a social dimension with more focus on interpersonal relationships. This finding partially supports the findings of Matsui and Onglatco (1991) in which instrumentality was a significant predictor

of the enterprising domain of career self-efficacy, and expressiveness was an important predictor of the social domain of career self-efficacy. This indicates that how self-efficacy relates to sex role orientation depends on the dimensions of self-efficacy. When the dimension reflects such characteristics as competitiveness and/or assertiveness, self-efficacy seem to be more related to masculinity. Similarly, when the dimension of self-efficacy measures social or interpersonal skills, the dimension seems to be more related to femininity.

Implications

Theoretical Implications

One theoretical implication of this study is related to reconceptualization of self-efficacy construct. Considering its wide impact on human behavior, defining the exact dimensions of the construct is of utmost importance. The findings of this study indicate that measurement of generalized self-efficacy may not be fruitful. Further, there is not enough evidence that general self-efficacy exists. Instead, measuring specific self-efficacy in a specific content domain seems to be more reasonable and manageable. When the construct is narrowly defined, such as math self-efficacy, then that construct can be adequately measured with well defined domains, for which representative items are developed. There can be many types of self-efficacy in specific content domains, and a few specific

domains of self-efficacy may be clustered to form a layer of "stratum" (Gorsuch, 1983, p. 337). More validation studies are needed in order to empirically derive primary factors and higher-order factors to build a more stable structure of self-efficacy to closely approximate the true structure of the construct.

Another implication of this study is that the two sex role measures, BSRI and PAQ, appear to measure a similar construct. In addition to the size of the correlations (r=.68 for BSRIM and PAQM, r=.59 for BSRIF and PAQF), the patterns of relationships shown between the two measures and variables used in this study were virtually identical. That illustrates that the two measures probably measure a comparable construct, which has been asserted by several researchers (Eells, 1996; Lubinski, Tellegen, & Butcher, 1983; Marsh & Myers, 1986).

Social Implications

The major social implication of this study is the potential danger of socializing children to become sex-typed individuals. Within the social learning theory framework, children develop sex role orientation mainly through observing sex-typed behaviors as were demonstrated through society (Mischel, 1970). The general practice in child rearing in this country is to encourage children to learn sex-typed behaviors, that is, little boys are socialized to be masculine and little girls to be feminine. Considering

that self-efficacy is the key construct that is related to achievement in a broad range of situations and that self-efficacy is much more related to masculinity than to femininity, it is clear that boys are socialized to be more achievement- and goal-oriented, while girls may be socialized to be less achievement-oriented. The relationship among the variables in this study make it clear that we have been socializing girls to be less competitive. Similarly, boys who are socialized to be more masculine (aggressive and competitive) may suffer losses in realizing the potential social relationships as instrumental part of life experience. Perhaps one of the issues in examining these relationships is the traditional definition of achievement. Maybe strong feminine qualities should relate to a reformulated definition of achievement. Perhaps, gender-fair definitions could replace the practice of penalizing those who are more feminine.

<div align="center">Limitations</div>

The interpretations of the results of this study may be subject to the following limitations. First, the sample in this study was a relatively homogenous and nonrandom sample. Approximately half the sample were males and about half were females with a mean age of 20. The majority of the sample were white (80%), single (87%), and freshman or sophomore (78%). These homogeneous characteristics of this sample may have a restriction of range effect on the results. Hence,

the factor structures observed in this sample may be different from factor structures that could be obtained from a more heterogeneous and random sample. The relationship reporting here could reflect underestimation due to this potential restriction of range as well. Second, the participants in this study received extra credit for their participation. This, in addition to possible response sets, may have distorted participants' true responses, which might have influenced the validity of the instruments used in this study. Third, the instruments used to measure variables in this study were developed for people within American culture. Combined with the cultural homogeneity of the sample, cross cultural analyses were not possible. Accordingly, a caution is needed in generalizing the results across cultures. Last, the results of this study have not been cross validated, which leads to a reserved interpretation of the results and implications.

Recommendations

Based on the findings of this study, the following recommendations are made. First, further validation studies regarding theoretical development of the self-efficacy construct are needed. More specifically, further studies need to address the following issues 1) how many dimensions of self-efficacy would accurately reflect the true structures of self-efficacy construct? 2) does general self-efficacy exist? 3) if general self-efficacy exists,

how can it be measured? 4) how does the multidimensional
self-efficacy relate to generalized self-efficacy? 5) how
situation specific is self-efficacy? This last point is
particularly important because the degree of specificity of
self-efficacy partially determines, according to Bandura
(1982), the predictive power of the construct on the
criterion behavior.

Second, more studies on sex role orientation are
warranted to bring better understanding of the construct.
In spite of numerous studies conducted on sex role
orientation, still there is no clear consensus on the
dimensions of the construct. Is it a bipolar construct with
masculinity and femininity or is it orthogonal? Or is there
a third dimension, such as androgyny? Also, how does the
structure of the BSRI relate to that of the PAQ?

Last, more studies are needed to investigate how
dimensions of self-efficacy relate to dimensions of sex role
orientation. Cross validation studies are also needed,
using different samples in order to increase our
understanding of self-efficacy and sex role orientation.

Conclusions

This study was designed primarily to investigate the
relationship between self-efficacy and sex role orientation.
The central finding of the study is that there is
substantive relationship between these two constructs. The
relationship between these two constructs have two profound

implications. One is how to socialize children and the other is how to define achievement. There are many risks in ignoring these relationship between self-efficacy and sex role orientation. The most serious risk will be the socialization of women, which keep them from achieving to their fullest potential.

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APPENDICES

APPENDIX A

INTERCORRELATIONS OF THE INSTRUMENTS AND INTERNAL

CONSISTENCY RELIABILITY COEFFICIENTS

Intercorrelations of the Instruments and

Internal Consistency Reliability Coefficients

MSES (N=651)

Scale	ESR	AA	SRL	LTEA	SRE	MOE	SSE	SAE	EPCS	TOTAL
ESR	.63									
AA	.18**	.72								
SRL	.38**	.48**	.87							
LTEA	.38**	.26**	.40**	.76						
SRE	.03	.18**	.21**	.09	.82					
MOE	.36**	.34**	.56**	.45**	.27**	.82				
SSE	.44**	.15**	.33**	.47**	.07	.46**	.76			
SAE	.39**	.21**	.40**	.41**	.18**	.40**	.51**	.79		
EPCS	.50**	.16**	.42**	.44**	.22**	.48**	.40**	.40**	.79	
TOTAL	.55**	.58**	.79**	.66**	.49**	.73**	.57**	.61**	.65**	.92

Note 1.

ESR : Self-Efficacy in Enlisting Social Resources
AA : Self-Efficacy for Academic Achievement
SRL : Self-Efficacy for Self-Regulated Learning
LTEA: Self-Efficacy for Leisure Time Skills and
      Extracurricular Activities
SRE : Self-Regulatory Efficacy
MOE : Self-Efficacy to Meet Others' Expectations
SSE : Social Self-Efficacy
SAE : Self-Assertive Efficacy
EPCS: Self-Efficacy for Enlisting Parental and Community Support

SES (N=651)

Scale	GENERAL	SOCIAL	TOTAL
GENERAL	.83		
SOCIAL	.63**	.69	
TOTAL	.95**	.84**	.86

BSRI (N=651)

Scale	MASCULINITY	FEMININITY
MASCULINITY	.88	
FEMININITY	-.06	.86

PAQ (N=651)

Scale	PAQM	PAQF
PAQM	.77	
PAQF	-.02	.78

APPENDIX B

MEANS AND STANDARD DEVIATIONS OF

THE SUBSCALES OF THE INSTRUMENTS

Means and Standard Deviations of Participants Scores on the

Subscales of the Instruments as a Function of Gender (N=651)

MSES

Subscales	Female (n=330)	Male (n=321)	Total (N=651)
ESR			
M	5.35	5.11	5.23
SD	.80	.93	.87
AA			
M	5.16	5.28	5.22
SD	.82	.85	.81
SRL			
M	5.04	4.89	4.96
SD	.82	.90	.86
LTEA			
M	4.90	4.94	4.92
SD	.95	.92	.93
SRE			
M	6.01	5.62	5.82
SD	.83	1.04	.96
MOE			
M	5.35	5.29	5.32
SD	.99	1.01	1.00
SSE			
M	5.88	5.72	5.80
SD	.79	.25	.85
SAE			
M	5.35	5.53	5.44
SD	1.04	.92	.98
EPCS			
M	5.34	4.94	5.14
SD	1.21	1.21	1.23
TOTAL			
M	5.34	5.22	5.28
SD	.58	.59	.59

SES

Subscales	Female (n=330)	Male (n=321)	Total (N=651)
SES: Social Efficacy Scale			
M	3.63	3.70	3.66
SD	.52	.50	.51
GES: General Efficacy Scale			
M	3.78	3.83	3.80
SD	.55	.56	.55
TOTAL			
M	3.72	3.78	3.75
SD	.49	.49	.49

BSRI

Subscales	Female (n=330)	Male (n=321)	Total (N=651)
BSRIM			
M	4.90	5.37	5.14
SD	.69	.70	.73
BSRIF			
M	5.27	4.64	4.96
SD	.55	.68	.69

PAQ

Subscales	Female (n=330)	Male (n=321)	Total (N=651)
PAQM			
M	2.61	2.97	2.79
SD	.57	.55	.59
PAQF			
M	3.19	2.81	3.00
SD	.46	.52	.53

APPENDIX C

CORRELATIONS AMONG

MSES, SES, BSRIM, BSRIF, PQQM, AND PAQF

Correlations among MSES, SES, BSRIM, BSRIF, PAOM, and

PAOF(N=651)

Scale	MSES	SES	BSRIM	BSRIF	PAOM	PAOF
MSES	————					
SES	.61**	————				
BSRIM	.46**	.57**	————			
BSRIF	.28**	.09*	−.06	————		
PAQM	.44**	.65**	.72**	−.20**	————	
PAQF	.29**	.22**	−.06	.68**	−.02	————

(by Gender)

Scale	MSES	SES	BSRIM	BSRIF	PAOM	PAQF
MSES	————	.63**	.51**	.25**	.49**	.28**
SES	.60**	————	.59**	.14*	.65**	.25**
BSRIM	.53**	.57**	————	.03	.68**	.03
BSRIF	.28**	.10*	.17**	————	−.11*	.59**
PAQM	.50**	.68**	.70**	−.04	————	.09
PAQF	.27**	.27**	.09	.63**	.11*	————

Note. 1

Upper : Females (N=330)

Lower : Males (N=321)

APPENDIX D

MEANS AND STANDARD DEVIATIONS OF FACTOR SCORES

Means and Standard Deviations of Factor Scores (N=651)

Measure	Factor		Females (n=330)	Males (n=321)
MSES	SLEF	M	.125	−.128
		SD	.905	.948
	SREF	M	.177	−.182
		SD	.745	1.106
	HSEF	M	.132	−.136
		SD	.962	.938
	LSEF	M	−.205	.211
		SD	1.012	.871
	SAEF	M	−.139	.143
		SD	.924	.877
	SSEF	M	.086	−.089
		SD	.884	.889
	ESEF	M	.167	−.171
		SD	.869	.909
	MEEF	M	.186	−.192
		SD	.890	.856
	EAEF	M	.221	−.227
		SD	.844	.850
SES	GEF	M	−.097	.100
		SD	.944	.909
	SEF	M	.047	−.048
		SD	.851	.899

SLEF: Self-Regulated Learning Efficacy Factor
SREF: Self-Regulatory Efficacy Factor
HSEF: Hard Sciences Achievement Efficacy Factor
LSEF: Leisure Time Skills Efficacy Factor
SAEF: Self-Assertive Efficacy Factor
SSEF: Soft Sciences Achievement Efficacy Factor
ESEF: Enlisting Parental and Community Support Efficacy Factor
MEEF: Meet Others' Expectation Efficacy Factor
EAEF: Extracurricular Activities Efficacy Factor

GEF: General Efficacy Factor
SEF: Social Efficacy Factor

APPENDIX E

CORRELATIONS OF FACTOR SCORES AND ORIGINAL SUBSCALE SCORES

Correlations of Fctors Scores and Original Subscale Scores (N=651): MSES

Subscale Factor	ESR	AA	SRL	LTEA	SRE	MOE	SSE	SAE	EPCS
SLEF(F1)	.20**	.18**	.87**	.13**	.31**	.43**	.10*	.16**	.21**
SREF(F2)	.03	.06	.11**	.00	.93**	.22**	.06	.12**	.14**
HSEF(F3)	-.15**	-.83**	-.44**	-.16**	-.13**	-.29**	-.14*	-.18**	-.11**
LSEF(F4)	.25**	.25**	.37**	.74**	.16**	.41**	.43**	.41*	.34**
SAEF(F5)	.41**	.24**	.40**	.37**	.07	.33**	.51**	.88*	.30**
SSEF(F6)	.23**	.63**	.52**	.35**	.22**	.49**	.17**	.14**	.19**
ESEF(F7)	.64**	.09*	.41**	.29**	.35**	.50**	.35**	.28**	.92**
MEEF(F8)	.55**	.09*	.35**	.24**	.25**	.70**	.81**	.42**	.43**
EAEF(F9)	.28**	.20**	.29**	.71**	-.04	.01	.42**	.29**	.26**

Note 1.

ESR : Self-Efficacy in Enlisting Social Resources
AA   : Self-Efficacy for Academic Achievement
SRL : Self-Efficacy for Self-Regulated Learning
LTEA: Self-Efficacy for Leisure Time Skills and
       Extracurricular Activities
SRE : Self-Regulatory Efficacy
MOE : Self-Efficacy to Meet Others' Expectations
SSE : Social Self-Efficacy
SAE : Self-Assertive Efficacy
EPCS: Self-Efficacy for Enlisting Parental and Community Support

SLEF: Self-Regulated Learning Efficacy Factor
SREF: Self-Regulatory Efficacy Factor
HSEF: Hard Sciences Achievement Efficacy Factor
LSEF: Leisure Time Skills Efficacy Factor
SAEF: Self-Assertive Efficacy Factor
SSEF: Soft Sciences Achievement Efficacy Factor
ESEF: Enlisting Parental and Community Support Efficacy Factor
MEEF: Meet Others' Expectation Efficacy Factor
EAEF: Extracurricular Activities Efficacy Factor

Note 2.

* p < .05 / ** p < .01

Correlations of Factors Scores and Original Subscale Scores
(N=651): SES

Subscale	GENERAL	SOCIAL
Factor		
GEF(Fac1)	.77**	.67**
SEF(Fac2)	.93**	.73**

Note 1.

GENERAL: General Self-Efficacy Subscale
SOCIAL: Social Self-Efficacy Subscale

GEF: Genral Self-Efficacy Factor
SEF: Social Self-Efficacy Factor

Note 2.

* p < .05 / ** p < .01

APPENDIX F

ROTATED OBLIQUE FACTOR STRUCTURE AND

PATTERN MATRIX OF THE MSES

Rotated Oblique Factor Structure and Pattern Matrix of the MSES
(N=651, Delta = -5)

Item	Fac1 SLEF	Fac2 SREF	Fac3 HSEF	Fac4 LSEF	Fac5 SAEF	Fac6 SSEF	Fac7 ESEF	Fac8 MEEF	Fac9 EAEF
1. How well can you get teachers to help you when you get stuck on schoolwork?									
2. How well can you get another student to help you when you get stuck on schoolwork?								(.39) .47	
3. How well can you get adults to help you when you have social problems?							(.53) .57		
4. How well can you get a friend to help you when you have social problems?								(.35) .46	
5. How well can you learn general mathematics?				(-.90) -.81					
6. How well can you learn algebra?				(-.96) -.87					
7. How well can you learn science?				(-.55) -.64					
8. How well can you learn biology?				(-.44) -.55					
9. How well can you learn reading and writing language skills?					(.53) .57				
10. How well can you learn to use computers?									
11. How well can you learn a foreign language?					(.32) .40				
12. How well can you learn social studies?					(.50) .51				
13. How well can you learn English grammar?					(.48) .53				
14. How well can you finish homework assignments by deadlines?	(.45) .54								
15. How well can you study when there are other interesting things to do?	(.64) .69								

Item	Pac1 SLEF	Pac2 SREF	Pac3 HSEF	Pac4 LSEF	Pac5 SAEF	Pac6 SSEF	Pac7 ESEF	Pac8 MEEF	Pac9 EAEF
16. How well can you concentrate on school subjects?	(.60) .71								
17. How well can you take class notes of class instruction?	(.39) .51								
18. How well can you use the library to get information for class assignments?									
19. How well can you plan your school work?	(.69) .77								
20. How well can you organize your school work?	(.62) .72								
21. How well can you remember information presented in class and textbooks?						(.38) .51			
22. How well can you arrange a place to study without distractions?	(.45) .54								
23. How well can you motivate yourself to do school work?	(.64) .72								
24. How well can you participate in class discussions?					(.46) .54				
25. How well can you learn sports skills?				(.89) .83					
26. How well can you learn dance skills?									(.47) .51
27. How well can you learn music skills?									(.50) .51
28. How well can you do the kinds of things that are needed to work on the school newspaper?									(.47) .57
29. How well can you do the kinds of things needed to be a member of the school government?									(.31) .43
30. How well can you do the kinds of things needed to take part in school plays?									(.53) .58

Item	Pac1 SLEF	Pac2 SREF	Pac3 HSEF	Pac4 LSEF	Pac5 SAEF	Pac6 SSEF	Pac7 ESEF	Pac8 MEEF	Pac9 EAEF
31. How well can you do regular physical education activities?					(.84) .82				
32. How well can you learn the skills needed for team sports (for example, basketball, volleyball, swimming, football, soccer)?					(.98) .92				
33. How well can you resist peer pressure to do things in school that can get you into trouble?			(.46) .51						
34. How well can you stop yourself from skipping school when you feel bored or upset?	(.34) .45								
35. How well can you resist peer pressure to smoke cigarettes?			(.55) .59						
36. How well can you resist peer pressure to drink beer, wine, or liquor?			(.69) .68						
37. How well can you resist peer pressure to smoke marijuana?			(.80) .81						
38. How well can you resist peer pressure to use pills (uppers, downers)?			(.76) .77						
39. How well can you resist peer pressure to use crack?			(.60) .59						
40. How well can you resist pressure to have sexual intercourse?			(.48) .52						
41. How well can you control your temper?									
42. How well can you live up to what your parents expect of you?								(.34) .49	
43. How well can you live up to what your teachers expect of you?								(.30) .48	
44. How well can you live up to what your peers expect of you?								(.43) .55	
45. How well can you live up to what you expect of yourself?								(.38) .49	

Item	Fac1 SLEF	Fac2 SREF	Fac3 HSEF	Fac4 LSEF	Fac5 SAEF	Fac6 SSEF	Fac7 ESEF	Fac8 MEEF	Fac9 EAEF
46. How well can you make and keep friends of the opposite sex?								(.43) .54	
47. How well can you make and keep friends of the same sex?								(.49) .57	
48. How well can you carry on conversations with others?								(.47) .56	
49. How well can you work in a group?								(.43) .54	
50. How well can you express your opinions when other classmates disagree with you?					(.68) .75				
51. How well can you stand up for yourself when you feel you are being treated unfairly?					(.66) .73				
52. How well can you deal with situations where others are annoying you or hurting your feelings?					(.47) .54				
53. How well can you stand firm to someone who is asking you to do something unreasonable or inconvenient?					(.43) .49				
54. How much can you get your parent(s) to help you with a problem?							(.73) .77		
55. How well can you get your brother(s) and sister(s) to help you with a problem?							(.61) .66		
56. How well can you get your parents to take part in school activities?							(.58) .63		
57. How well can you get people outside the school to take an interest in your school (community groups, churches)?							(.47) .58		

Note.
SLEF: Self-Regulated Learning Efficacy Factor
SREF: Self-Regulatory Efficacy Factor
HSEF: Hard Sciences Achievement Efficacy Factor
LSEF: Leisure Time Skills Efficacy Factor
SAEF: Self-Assertive Efficacy Factor
SSEF: Soft Sciences Achievement Efficacy Factor
ESEF: Enlisting Parental and Community Support Efficacy Factor
MEEF: Meet Others' Expectation Efficacy Factor
EAEF: Extracurricular Activities Efficacy Factor

APPENDIX G

ROTATED OBLIQUE FACTOR STRUCTURE AND

PATTERN MATRIX OF THE SES

(N=651, Delta = 0)

Item	Fac1 GES	Fac2 SEF
2. When I male plans, I am certain I can make them work.		
3. One of my problems is that I cannot get down to work when I should.	(.47) .42	
4. If I can't do a job the first time, I keep trying until I can.	(.57) .55	
6. It is difficult for me to make new friends.		(.73) .69
7. When I set important goals for myself, I rarely achieve them.	(.49) .53	
8. I give up on thing before completing them.	(.60) .61	
10. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.		(.42) .46
11. I avoid facing difficulties.	(.42) .45	
12. If something looks too complicated, I will not even bother to try it.	(.55) .54	
14. If I meet someone interesting who is very hard to make friends with I'll soon stop trying to make friends with that person.		( ) .41
15. When I have something unpleasant to do, I stick to it until I finish it.	(.48) .46	
16. When I decide to do something, I go right to work on it.		
18. When trying to learn something new, I soon give up if I am not initially successful.	(.60) .58	
19. When I'm trying to become friends with someone who seems unpleasant at first, I don't give up easily.		(.41) .45

Item	Fac1 GES	Fac2 SEF
20. When unexpected problems occur, I don't handle them well.	(.43) .45	
22. I avoid trying to learn new things when they look too difficult for me.	(.61) .60	
23. Failure just makes me try harder.	(.55) .56	
24. I do not handle myself well in social gatherings.		(.62) .63
26. I feel insecure about my ability to do things.	( ) .49	
27. I am a self-reliant person.	(.40) .42	
28. I have acquired my friends through my personal abilities at making friends.		(.63) .59
29. I give up easily.	(.64) .70	
30. I do not seem capable of dealing with most problems that come up in my life.	(.46) .52	

GEF: Genral Self-Efficacy Factor
SEF: Social Self-Efficacy Factor

APPENDIX H

SCREE PLOT FOR MSES

Scree Plot for MSES

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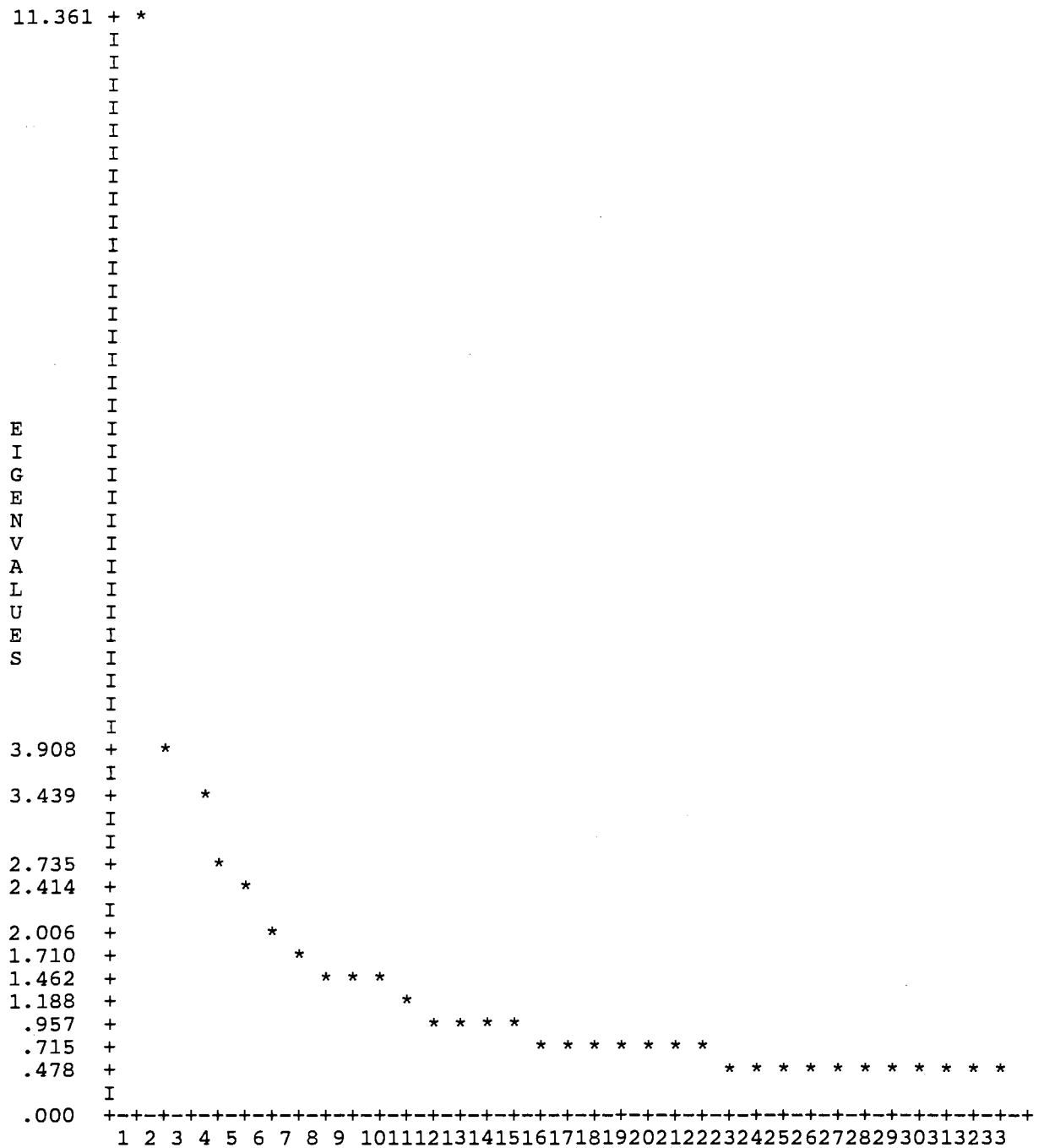
APPENDIX I

SCREE PLOT FOR SES

Scree Plot for SES

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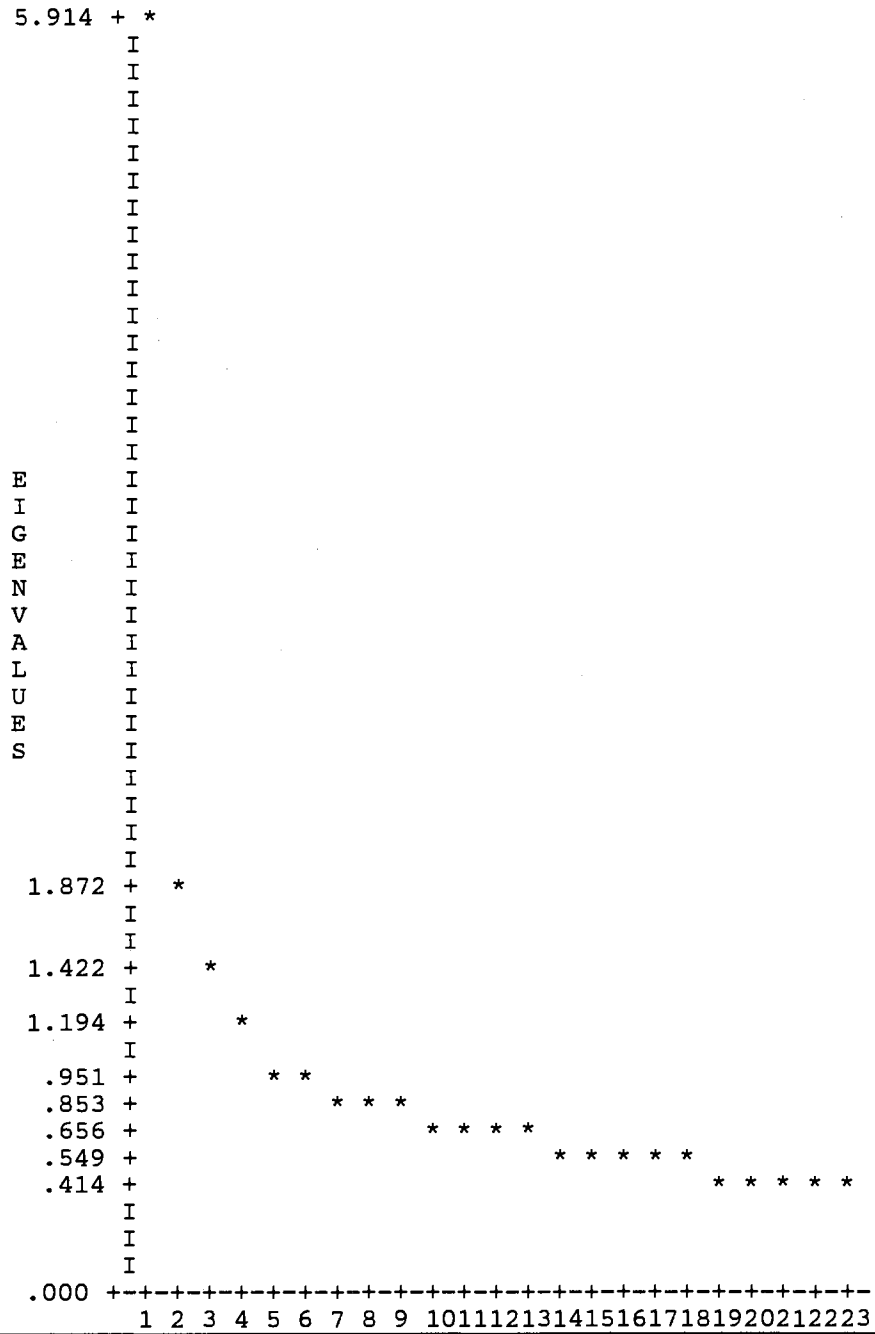
APPENDIX J

PARTICIPANT STANDARDIZED INSTRUCTIONS

PARTICIPANT STANDARDIZED INSTRUCTIONS

Hi. My name is Namok Bryant. I am a graduate student in educational research in the department of Applied Behavioral Studies in Education. We are interested in understanding the relationship between self-efficacy and sex role orientation. So, we are inviting you to participate in this study.

If you choose to participate, you will be first asked to read and sign a consent form. You may keep the consent form except the bottom portion where you sign. After completing the consent form, you will be asked to complete a demographic questionnaire, and four paper and pencil instruments. Do not write your name on any of the instruments.

If you experience uneasiness or stress while you are reacting to any item, you are free to skip those items or to withdraw. However, if you choose to complete all the questions, your reactions will be kept anonymous. No one, including the researcher, will be able to identify individual participants.

Once the study is completed, I will be glad to provide the results to you. If you have any questions regarding any aspect of this study, please feel free to contact:

Namok Choi Bryant
116 N. Murray
Department of Applied Behavioral Studies in
Education
Oklahoma State University
Stillwater, OK 74078
(405) 744-6040

APPENDIX K

ORAL SOLICITATION FORM

ORAL SOLICITATION FORM

Hi. My name is Namok Bryant. I am a graduate student in educational research in the department of Applied Behavioral Studies in Education. I am here to invite you to participate in a study. I will explain the study very briefly.

I am looking at two different things; self-efficacy and sex role orientation. Self-efficacy is a belief that you can get necessary things done to achieve your goal. Sex role orientation has to do with how you perceive your sex role, feminine or masculine. My primary question is about the relationship between self-efficacy and sex role orientation. I'd like to find out how your sex role orientation is related to how you perceive your self-efficacy. Another question I have is more theoretical. That question is related to the dimensions of self-efficacy. Is it multidimensional or unidimensional?

Answers to those questions I propose will be very important to understand our learning behaviors. The answers those questions provide will be also very important in the theory development. I'd like you to help me find those answers. You could be one of the significant contributor to finding those answers.

I will distribute a stub which indicates where and when to come to participate. Thank you for your cooperation and time.

APPENDIX L

CONSENT FORM

CONSENT FORM

The Relationships between Structural Dimensions of Self-Efficacy scales and Sex role orientation

I understand that:

1) the purpose of this study is to explore the relationship between self-efficacy and sex role orientation;

2) I will be requested to complete a demographic questionnaire and four paper and pencil instruments;

3) it will take approximately 30 minutes to fill out the instruments;

4) my name will NOT appear on any of the instruments;

5) all records are anonymous;

6) participation is completely voluntary and that I have the right to withdraw from this study AT ANY TIME;

7) I may contact Dr. Dale Fuqua at (405) 744-6040 should I wish further information. I may also contact Jennifer Moore, IRB executive secretary, 305 Whitehurst, Oklahoma State University, telephone (405) 744-5700.

I have read and fully understand the consent form. I sign it freely and voluntarily.

Date _____

Signature _____

APPENDIX M

DEMOGRAPHIC INFORMATION QUESTIONNAIRE

DEMOGRAPHIC INFORMATION QUESTIONNAIRE

Please check one response for each question.

1. Age: _____

2. Gender: _____ male
_____ female

3. Ethnicity: _____ African American
_____ Native American
_____ Caucasian
_____ Hispanic
_____ Asian
_____ Other

4. Grade Level: _____ Freshman
_____ Sophomore
_____ Junior
_____ Senior
_____ Other

5. Marital Status: _____ Single
_____ Married
_____ Divorced
_____ Partnered

6. Rate your academic achievement as a college student.

Very Low   Very High
    1   2   3   4   5   6   7

7. What grade do you expect in this class?

    F   D-   D+   C-   C+   B-   B+   A-   A+
    1   2   3   4   5   6   7   8   9

8. Overall, how **masculine** do you believe you are?

Not Masculine at all   Very Masculine
    1   2   3   4   5   6   7

9. Overall, how *feminine* do you believe you are?

Not Feminine at all   Very Feminine
    1   2   3   4   5   6   7

APPENDIX N

INSTITUTIONAL REVIEW BOARD FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 11-08-95   IRB#: ED-96-044

Proposal Title: THE RELATIONSHIPS BETWEEN THE STRUCTURAL
DIMENSION OF MULTIDIMENSIONAL SELF-EFFICACY SCALES AND SEX ROLE
IDENTITY

Principal Investigator(s): Dale Fuqua, Namok Choi Bryant

Reviewed and Processed as: Expedited

Approval Status Recommended by Reviewer(s): Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD
AT NEXT MEETING.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A
CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD
APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR
APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval
are as follows:

Signature: Date: November 17, 1995
Chair of Institutional Review Board

VITA

Namok Choi Bryant

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE RELATIONSHIP BETWEEN THE STRUCTURAL DIMENSIONS
OF SELF-EFFICACY SCALES AND SEX ROLE ORIENTATION

Major Field: Applied Behavioral Studies

Biographical:

Personal Data: Born in Seoul, Korea, May 19, 1958,
the daughter of Chun-Tak Choi and Bok-Ran Lee.

Education: Graduated from Chang-duck Girls' High
School, Seoul, Korea in February, 1976; received
Bachelor of Arts degree in English Literature from
Sung-shin Women's University in February, 1983;
received Master of Science degree in Educational
Research and Evaluation from Oklahoma State
University in July, 1993; completed requirements
for the Doctor of Philosophy degree with a major
in Educational Research and Evaluation at Oklahoma
State University in May, 1997.

Professional Experience: English Teacher, Korea, 1983-
1990;Research Assistant, Department of Applied
Behavioral Studies in Education, Oklahoma State
University, 1992-1993; Research Assistant, Office
of University Assessment, Oklahoma State
University, 1992-1995; Teaching Assistant,
Department of Applied Behavioral Studies in
Education, Oklahoma State University, 1991-
present.

Professional Affiliations: American Educational
Research Association, National Council on
Measurement in Education.