

Cognitive Development in Student Leaders and Non-leaders

by

L. Cara Skeat

Thesis submitted to the Faculty of

Virginia Polytechnic Institute and State University

in partial fulfillment of the requirements for the degree of

MASTERS OF ARTS IN EDUCATION

in

Higher Education and Student Affairs

Approved:

---

Joan B. Hirt, Chairperson

---

John A. Muffo

---

D. David Ostroth

May 10, 2000

Blacksburg, Virginia

## Cognitive Development in Student Leaders and Non-leaders

L. Cara Skeat

### Abstract

This study examined cognitive development in student leaders and non-leaders. Participants included 60 students (30 student leaders and 30 non-leaders). Each group contained equal numbers of males and females. The Measure of Epistemological Reflection (MER) (Baxter Magolda & Porterfield, 1985) was administered to participants to measure certain indicators of cognitive development.

Cognitive development refers to the increase in cognitive complexity that may occur in students during their college years and includes students' ways of making meaning from what they learn. Students' ways of making meaning refers to changes in students' attitudes towards the nature of knowledge and truth. This development can be measured by examining how students learn, make decisions, relate to their teachers and peers, and perceive knowledge.

Analysis of these data revealed that leaders had significantly higher scores than did non-leaders. No gender differences were found, however, and no differences were found when female leaders were compared to female non-leaders or male leaders were compared to male non-leaders.

This research has implications for several groups. First, this study might be useful to student affairs professionals who work with clubs and organizations. The results provided staff with baseline data about leaders' and non-leaders' cognitive reasoning skills. Such information may enable staff to develop purposeful interventions to promote growth in cognitive reasoning skills among student leaders. The results of this study may also be useful for other student affairs professionals who try to enhance their students' cognitive development levels. For example, residential life professionals may find the results of this study interesting. The results provided them with information about cognitive development in student leaders and non-leaders, which they may then compare with their own students' levels of cognitive development. Current students may also be interested in the cognitive reasoning levels of student leaders and non-leaders. They may use these findings to understand their own cognitive development and formulate goals for this development.

## Acknowledgments

Without the help of many people, this research project would not have been completed. First of all, I would like to thank my HESA cohort for the never-ending support and friendship that we have all extended to one another. You all have helped me understand the meaning of friendship and collegueship. From our first days in class to our last semester's struggles with research and job-hunting, we have always found the humor in our struggles, the lessons in our difficulties, and the joys in our lives as grad students.

Second, great thanks are due to my committee. John Muffo has provided several hours of patient instruction in statistics. I would like to thank David Ostroth for his interest in and support of my topic. Finally, Joan Hirt -- thank you for reminding me not to get discouraged, for supporting me in the seemingly endless search for research participants, and for all your advice about research, employment, and life.

The students of the Virginia Tech Union, with whom I have worked this year, also deserve my thanks. They have willingly participated in my research, encouraged me when this process was difficult, and rejoiced and commiserated with me through the job search process. They have also taught me a great deal about advising student organizations. They are truly special people.

Finally, I thank my family for their encouragement and understanding throughout the past two years. I know I have had a lot of ups and downs and their support never wavered. Thanks for seeing me through everything!

## Table of Contents

Abstract .....	ii
Acknowledgments .....	iv
Chapter One: Introduction.....	1
Purpose of the Study.....	7
Research Hypotheses.....	7
Significance of the Study .....	8
Limitations .....	10
Organization of the Study.....	10
Chapter Two: Literature Review .....	12
Existing Research About Student Leaders .....	12
Relevant Cognitive Development Theory .....	17
Instruments That Measure Cognitive Development.....	20
Research Using the Measure of Epistemological Reflection .....	22
Chapter Three: Methodology .....	24
Sample Selection .....	25
Instrumentation.....	28
Reliability and Validity of the Measure of Epistemological Reflection .....	30
Reliability .....	30
Validity.....	33
Data Collection Procedures .....	34
Data Analysis Procedures.....	36
Chapter Four: Results.....	38
Procedures .....	38
Description of the Sample .....	38
Data Analysis .....	40
Chapter Five: Discussion and Implications.....	44
Discussion .....	44
Relationship of Findings to Prior Research.....	51
Implications of the Study .....	52
Limitations .....	55
References .....	58
Appendices.....	63

List of Tables

Table 1. Characteristics of the Sample.....	39
Table 2. Results of ANOVAs Examining Cognitive Level by Main and Interaction Effects.....	41

List of Appendices

Appendix A: Email Sent to Potential Student Leader Participants ..... 63  
Appendix B: Protocol Used to Screen Potential Participants ..... 65  
Appendix C: The Measure of Epistemological Reflection ..... 67

## Chapter One: Introduction

Institutions of higher learning have always sought to offer their students quality education. Historically, colleges and universities used accountability as their primary method of demonstrating quality. This was typically accomplished through accreditation procedures, whether by an outside body or by the state government under which they operated. Accreditation held institutions accountable to standards based upon select statistics. For example, schools have been assessed based on graduation rates, number of faculty publications, and other traditional definitions of academic success. Other accountability measures used to evaluate colleges and universities include the amount of money available to the school, standardized test scores of incoming students, and students' high school grades (Hyman, Beeler, & Benedict, 1994).

However, there have been critics of this traditional approach to measuring accountability. For example, under these types of accountability procedures, colleges and universities with large operating budgets and high-achieving incoming students have been rated as superior to colleges with smaller budgets and less exemplary incoming students. An additional criticism has focused on the way in which accountability measures focused on input variables, such as incoming student test scores (Woodard, Hyman, von Destinon, & Jamison, 1991).

In response to this criticism, a broader definition of quality has emerged over the past 20 years (Woodard, et. al., 1991). This definition is based on student outcomes. Today's colleges and universities, while still concerned with input variables, may also attempt to measure various outcomes of the educational process. These outcomes include increased critical thinking skills (Pascarella, 1987), improved standardized test scores on the tests that students take near the end of their college years, (Academic Senate for California Community Colleges, 1998) and measurable gains in students' knowledge. Measuring gains in student learning has emerged as a particular focus of assessment (Schilling & Schilling, 1998). As a result of the development of these new outcome measures, accrediting bodies have begun to demand that colleges and universities demonstrate outcomes and have added outcomes assessment to the criteria by which they evaluate and accredit schools (Hyman, et al., 1994).

As the definition of quality used by colleges and universities broadened, their methods of demonstrating quality changed. Colleges and universities have begun to utilize outcomes

assessment to demonstrate quality. This type of assessment measures student progress through all facets of the educational process (Woodard, et al., 1991). Outcomes assessment measures a specific outcome, such as student learning, and relates it to a specific “input,” such as the type of teaching a student receives (Marwick, 1998). Input and outcome variables may come from all aspects of the university, including academics and student affairs.

This switch from the use of input variables to the use of outcome variables to measure quality was caused by three major changes in higher education: the stagnation of funding levels, increases in demand for higher education, and the emergence of the idea of the student as consumer (Woodard, et al., 1991). All of these factors increased the pressure on colleges and universities to demonstrate quality to a variety of constituencies.

In many states, public funding for education has experienced periodic difficulties. This means that in some states, funding for higher education has not increased for several years, while in other states it has increased only at the rate of inflation (Callan, 1993). At the same time, the cost of providing higher education has increased. The services and programs provided by the institutions of higher education cost more to produce, while public funding has stayed the same or even declined. In fact, per-student funding, when adjusted for inflation, has stayed the same since 1976, while the cost of providing that student with an education has risen by about 40% (Benjamin, 1998). The result is that institutions of higher education must try to maintain or improve their quality while keeping costs within the confines of available funding (Baxter Magolda & Porterfield, 1988).

In this climate of stagnant funding, more and more students are going to college, which means that colleges must provide quality education for more people with the same amount of funding (Akerheim, Berger, Hooker, & Wise, 1998). There are several reasons for this increase in higher education enrollment. The high numbers of adults returning to school at community colleges as well as an increase in the number of traditional-age students attending college for the first time (Mellander & Mellander, 1997) have contributed to the rising numbers of students in college. In particular, the number of part-time students has increased (Altbach, 1993) as has the number of college and university students who belong to non-traditional groups. Since the 1980s, the numbers of female, Asian American, and Hispanic students attending college have all increased (Altbach, 1993). Ethnic minorities made up 16.2% of all students in 1976. By 1999,

they made up 26.2% of all students. In addition, the proportion of women enrolled in higher education increased from less than 50% of all students in 1976 to 55.8% of all students in 1999. Overall, this means that enrollment in higher education has increased from 11,121,426 in 1976 to 14,367,520 in 1999 (Almanac, 1976; Almanac, 1999).

Meanwhile, students have become consumers to whom colleges and universities must market themselves. One marketing strategy campuses have employed is publicizing the quality of the education they offer. To demonstrate quality, colleges and universities are using increasingly sophisticated marketing campaigns (Johnson, 1998). As these student consumers demand quality education, the importance of demonstrating quality has increased. Parents and prospective students form an audience that demands quality and holds institutions of higher education accountable for providing that quality (Gaither, 1997).

All of these factors contribute to an increasing demand for institutions of higher education to demonstrate quality in a variety of areas. The outcomes assessment trend has been higher education's response to this demand. For example, it is no longer enough for colleges to boast of the test scores of their incoming classes. Colleges and universities must also cite the outcomes achieved by their students as a result of university attendance: knowledge gains, growth in thinking skills, and other outcomes that are all used to attract students to colleges (Pascarella, Ethington, & Smart, 1988).

As a result, outcomes assessment has become a major form of evaluation. In the case of public higher education, the state governments themselves have begun to require colleges and universities to conduct outcome assessment efforts. State systems of higher education use outcomes assessment as a method of assigning funds to the individual institutions in the system. This is called performance based-funding (Serban, 1998).

Performance-based funding has emerged in the past 15 years as a way of connecting school performance with state funding and has provided a way for states to allocate scarce funds and a means by which institutions and systems higher education can be held accountable by taxpayers (Serban, 1998). Half of the states use some type of performance-based funding (Burke, 1998).

Both public and private universities use outcomes assessment as a way to measure their success. (Hyman, et al., 1994; Schilling & Schilling, 1998). Most campuses have some form of

“inside” assessment in place, and most do assessment of some kind frequently (Schilling & Schilling, 1998). Institutions then use these data to look at the quality of students’ “educational experience” (Woodard, et. al., 1991, p. 18).

Both external and internal outcomes assessment in higher education have focused on two areas of students’ experiences: the curricular realm and the cocurricular realm. A great deal of assessment has been conducted in the curricular realm of higher education to determine whether students are achieving desirable outcomes. For example, colleges and universities examine how satisfied their students are with classes, professors, and textbooks. Assessment inside the classroom may involve some measure of skill development, student learning processes and knowledge gains, and peer review (Schilling & Schilling, 1998). Student performance on standardized tests may also be used in assessment by the curricular realm (Astin, 1997). In addition, various institutions have measured persistence rates, transfer rates (Arnold & Ugale, 1996), and skill competency (McCain, Hine, & Wolfertz, 1998). The results of these assessments are then used by the university to evaluate the quality of the institution (Schilling & Schilling, 1998).

One form of academic assessment is particularly relevant to the present study: the measurement of students’ cognitive development. Cognitive development is defined as the increase in cognitive complexity that may occur in students as they progress through college (Evans, Forney, & Guido-DiBrito, 1998). This can include any or all of the following: students’ ability to distinguish between various types of stimuli, the complexity of students’ ways of understanding events or ideas, students’ ability to organize information, students’ communication skills, self-image (Williams, 1994), and students’ ways of making meaning (Baxter Magolda & Porterfield, 1988). “Students’ ways of making meaning” refers to changes in students’ attitudes toward the nature of knowledge and truth. This development is seen in the way students learn, make decisions, relate to their teachers and peers, and perceive knowledge. Some examples of cognitive outcomes that may be used in assessment include “the use of higher-order mental processes such as reasoning and logic,” (Astin, 1997, p. 9), knowledge gains, and increased intellectual ability (Astin, 1997).

However, not all assessment has focused on the curricular aspects of the university. The student affairs arena of the university has also become involved in outcomes assessment efforts.

A survey of member schools of the National Association of Student Personnel Administrators (NASPA) found that a quarter of all respondent schools had student affairs units involved in outcomes assessment (Woodard, et. al., 1991).

Assessment in student affairs has typically focused on student development, a primary goal of student affairs programs. Professionals plan interventions designed to encourage students to grow or develop in certain ways. These types of development include psychosocial development, moral development, and cognitive reasoning development (Evans, et al., 1998).

Psychosocial development refers to the development of identity and competence. For example, students' abilities to manage their emotions, form interpersonal relationships, or develop autonomy may be assessed when psychosocial development is measured. As students experience psychosocial development, they may separate from their family, develop methods of coping with stressful situations, and build mature relationships with others (Evans, et al., 1998).

Moral development refers to changes in students' understanding of moral issues. Students' abilities to make difficult decisions, form ethical codes, and the ways in which they view the ethics of others all relate to moral development. For example, students may move from making moral decisions based purely on following rules made by others to making such decisions based on a well-thought-out system of personal morality (Evans, et al., 1998).

Cognitive development, when measured by student affairs professionals, refers to the same type of cognitive development assessed in the curricular areas of the university. Again, cognitive development includes such areas as ability to manage complex thoughts (Williams, 1994), knowledge gains (Astin, 1997), and ways in which students view the nature of knowledge and truth (Baxter Magolda & Porterfield, 1988).

Cognitive development is one type of outcome that student affairs professionals may seek to influence, just as their academic counterparts do. While the concept of cognitive development may seem more a part of the faculty realm of influence, it is also a type of development that student affairs professionals can attempt to affect and to measure. In fact, the Student Learning Imperative (SLI) (American College Personnel Association, 1994) encouraged student affairs professionals to promote cognitive and psychosocial development in the interventions they design.

Various types of student affairs units on campus may attempt to promote cognitive development. For example, student staff in residence life programs may take classes designed to help them solve problems in the residence hall. Such classes may encourage students to think about issues at a more mature level. Student affairs professionals may also present interventions dealing with specific areas of cognitive development, such as decision-making.

Student affairs professionals in leadership development offices also may try to promote cognitive development. For example, student leaders may take leadership classes that encourage them to think about leadership at a higher level than they are currently using, relating theory to practice in ways they may not ordinarily consider. Other interventions designed to promote mature thinking processes may include specific training sessions for members of student organizations or certain groups of student leaders.

There is little research on the relationship between specific student affairs interventions and cognitive development outcomes. Much of what does exist examines moral development as a specific type of cognitive development. For example, Kuh and Lund (1994) studied the relationship between increased moral awareness and participation in student government. The effect of club and organization membership on freshmen students' moral development has also been studied (Marlowe & Auvenshine, 1982). Another area of research is the impact of involvement in leadership experiences on the development of humanitarian values in college students (Pascarella, et al., 1988). Astin (1997) examined the overall issue of involvement and cognitive development in the form of curricular outcomes, primarily persistence to graduation.

In summary, many colleges and universities are currently using outcome assessment. Cognitive development is one desired outcome that has been assessed in the curricular realm. However, student affairs professionals may also design programs to effect cognitive development. The outcomes of such programs have not been studied as extensively. This study was designed to address that gap in the existing body of literature on outcomes associated with higher education.

The present study operates from the assumption that increased cognitive development is a desired outcome of many student affairs interventions. One example of this type of intervention is student affairs professionals' work with students who are leaders of clubs and organizations on campus. If leadership development professionals know the extent to which their interventions

affect their students' cognitive levels, they could design programs to enhance those levels. For this reason, cognitive development is one area in which student affairs professionals may focus their assessment efforts.

### Purpose of the Study

The purpose of this study was to examine cognitive levels among two groups of students: those who have had a leadership experience and those who had never had such an experience. For the purpose of this study, the leadership experience was defined as holding the office of president in a registered student organization at the institution where the research was conducted. Non-leaders were defined as students who have never held any leadership position in a registered student organization.

To assess students' levels of cognitive development, the Measure of Epistemological Reflection (MER) (Baxter Magolda & Porterfield, 1985) was administered to students. This instrument measures college students' levels of cognitive reasoning in six domains: the students' decision-making abilities, how students perceive their own roles in their own learning processes, the students' concept of the role of peers in the learning process, the students' concepts of professors' roles in the learning process, students' beliefs regarding evaluation of work, and students' perceptions of the nature of truth and knowledge. Respondents are asked to give short answers to questions that explore each of these domains. Many of these questions ask students to describe experiences such as making an important decision.

### Research Hypotheses

In general, this study compared the mean scores of various groups of participants. Participants were grouped by status as leaders or non-leaders and by gender. This yielded several ways that participants could be compared: leaders versus non-leaders, female student leaders versus female non-leaders, male student leaders versus male non-leaders, female student leaders versus male student leaders, and female non-leaders versus male non-leaders. Specifically, this study was designed to test the following hypotheses:

1. There is no significant difference in the mean total MER scores of students who have had a leadership experience and those who have not had this experience.
2. There is no significant difference in the mean total MER scores of male students and female students.

3. There is no significant difference in the mean total MER scores of female students who have had a leadership experience and male students who have had a leadership experience.
4. There is no significant difference in the mean total MER scores between female students who have not had a leadership experience and male students who have not had a leadership experience.
5. There is no significant differences in the mean total MER scores of male students who have had a leadership experience and those who have not.
6. There is no significant difference in the mean total MER scores of female students who have had a leadership experience and those who have not.
7. There is no significant interaction between gender and leadership status among the participants in the study.

#### Significance of the Study

This study was significant both for student affairs practitioners and for future research in student affairs. In terms of practice, several groups of individuals might benefit from the results of this study. For example, this study might be useful to student affairs professionals who work with clubs and organizations. The results provided staff with baseline data about leaders' and non-leaders' cognitive reasoning skills. Such information may enable staff to develop purposeful interventions to promote growth in cognitive reasoning skills among student leaders.

The results of this study may also be useful for other student affairs professionals involved in leadership development. For example, residential life professionals trying to enhance their students' cognitive development levels may find the results of this study interesting. The results provided them with information about cognitive development in student leaders and non-leaders, which they may then compare with their own students' levels of cognitive development.

This study also benefited current student leaders. These students may be interested in the cognitive reasoning levels of student leaders and non-leaders. This study provided student leaders with information about cognitive reasoning levels among student leaders. They may use these findings to understand their own cognitive development and formulate goals for this development.

Potential student leaders, who might also be interested in knowing about cognitive reasoning levels of student leaders and non-leaders, might also benefit from the results of the present study. Such information may help potential leaders to formulate goals for their leadership experience that relate to their own stages of cognitive development.

Future employers, who might be interested in whether leadership experiences make a difference in potential employees' cognitive development levels, might also benefit from this study. Such information may help future employers evaluate the college experiences of their potential employees.

This study could also be useful in promoting future research projects. This study examined levels of cognitive complexity among student leaders and non-leaders. A future study could examine other types of cognitive development, such as moral reasoning, using the same groupings of participants as this study. Such a study would enhance the current body of knowledge about cognitive development among student leaders and non-leaders.

One type of student development, cognitive development, was examined in the present study. Future studies could examine other forms of student development, such as psychosocial development, found in student leaders and non-leaders. Such a study would enhance student affairs professionals' understanding of more general development among leaders and non-leaders.

The student leader participants in this study all shared the characteristic of being presidents of student organizations. A future study could group students according to some other experience, such as status as a residence hall staff member, and examine the cognitive development levels among staff members and non-staff members. Such a study would enhance the body of knowledge about differences in cognitive reasoning levels among students who have had various experiences intended to be developmental.

Researchers at different types of colleges and universities from the one where this study was conducted could repeat this study at their universities.. The present study was conducted on leaders and non-leaders at a Research I institution. Private colleges and community colleges each provide different leadership experiences to their students, and research could examine whether the cognitive development levels of leaders and non-leaders are different at other types of

institutions. Again, such a study would broaden the profession's body of knowledge about cognitive development.

### Limitations

The present study provided information for future professional practice and research. It also had several limitations. The first had to do with sampling. All participants were students at a single institution. It is possible that these students differed in some way from students at other institutions. If so, the results may have been skewed. Also, the volunteer non-leaders may not be a representative sample of non-leaders. They also may not match well on other student demographics, such as high school grades, work habits, or other factors. If this occurred, the results might have been influenced.

Another limitation also had to do with the criteria used to select the student leader sample. The definition of a leadership experience used in this study was narrow and did not include experiences outside the presidency of a registered club or organization. Had a broader definition of leadership been employed, the results may have differed.

Other limitations may result due to the instrument used. It is possible that the MER does not measure all aspects of students' cognitive development. Had a different instrument been used, the results may have differed.

In addition, there may be other background variables that could influence participants' scores for which the researcher did not control. The study matched participants by age, year in school, major, and grade point average, but some other variable could have an impact on participants' scores.

Finally, there is the possibility that the raters of the participants' MERs could be wrong in the scores they assigned to the participants. However, these limitations do not detract from the usefulness of the study. The present study was useful because it examined an area of student development that other studies on both involvement and cognitive development have not examined.

### Organization of the Study

This study is organized around five chapters. The first contained an overview of the study, including the purpose of the research and the statistical hypotheses to be tested. Chapter Two provides a literature review on the topic of cognitive development. In Chapter Three, the

methodology of the study is explained, including the sampling techniques and the procedures used to collect and analyze data. Chapter Four reports the results of the study, while Chapter Five contains a discussion of these results and their implications for future practice and research.

## Chapter Two: Literature Review

The present study was designed to examine levels of cognitive development in student leaders and non-leaders. In order to examine the research relevant to this study, it was necessary to examine several bodies of literature. First, the current literature comparing leaders and non-leaders is explored. Next, the work of the particular theorists on whom the present study was based is investigated. Then, instruments that measure cognitive development are explored, including the instrument used in the present study. Finally, research that employed the instrument used in the present study is examined.

### Existing Research About Student Leaders

A review of the literature on student leaders revealed some interesting findings. Research pertaining to student leaders and non-leaders has focused on several different areas: the importance of involvement, the effects of membership in a student organization, and skill development, psychosocial development, moral development, and cognitive development among student leaders.

Some of the literature on college student leadership focuses on leadership and some form of involvement. There have been numerous studies about the influence of involvement on college students. Scholars have examined involvement and interaction with peers, interaction with faculty and staff, and the sense of community on campus (Astin, 1977; Kuh, 1991).

Research has suggested there are links between involvement and certain outcomes in college students. One outcome associated with involvement is persistence to graduation (Carroll, 1988; Mallinckrodt, 1988; Nelson, Scott, & Bryan 1984; Pascarella & Terenzini, 1991). Involvement, such as interaction with peers and faculty, or joining an organization or planned endeavor with peers, has been linked to a sense of community on campus, which may influence students to stay enrolled (Boyer, 1987). Other outcomes of involvement include increased self-awareness (Springer, Terenzini, Pascarella, & Nora, 1995), increased self-esteem (Astin & Kent, 1983), and development of various thinking skills (Pascarella, Bohr, Nora, Zusman, Inman, & Desler, 1993).

Other studies have examined the lasting effects of out-of-class involvement and found that out-of-class involvement may have a more lasting impact on students than their in-class experiences (Kuh, Douglas, Lund, & Ramin-Gyurnek, 1994). It is possible that the integration of

in- and out-of-class experiences promotes lasting growth in college students (Kuh, et al., 1994; Pace, 1987; Pascarella, 1989; Terenzini, Springer, Pascarella & Nora, 1994).

The effects of membership in a student organization have also been explored. Studies have examined the outcomes associated with membership and the possibility that membership is associated with certain benefits not available to students who do not join organizations. It would seem that participation in student organizations or activities is related to desired outcomes for students, such as skill development, leadership ability, and psychosocial development (Kuh, 1991; Schuh & Laverty, 1983; Williams & Winston, 1985), and may be a deterrent to attrition (Vaughan, 1968).

Skill development in certain areas is related to membership in a club or organization. Membership in a student organization is related to increased teamwork. Increased planning skills are also associated with membership in a student group (Schuh & Laverty, 1983). Leadership experience in extracurricular activities is also a predictor of workplace success (Howard, 1986; Kuh, 1995). For recent college graduates working in business settings, involvement in extracurricular activities may be positively related to high work standards, decision-making, creativity, and organization and planning skills. This is particularly true for students who were leaders in student government, college newspapers, or debate teams (Howard, 1986).

Psychosocial outcomes are also associated with membership in a student organization. Psychosocial outcomes refer to personal development in areas such as identity development, the development of autonomy, and the ability to form lasting relationships (Evans, et al., 1998). Members of student organizations score higher on psychosocial development measures than their non-member counterparts (Williams & Winston, 1985). Other psychosocial benefits that have been related to membership in a student organization include interpersonal competence, particularly the ability to participate in mature interpersonal relationships (Kuh, 1991), and increased self-esteem (Astin & Kent, 1983; Hood, 1984). Finally, students' involvement has been shown to be particularly important in the development of humanitarian and civic involvement values (Pascarella, et al., 1988).

Other studies have examined the benefits of one particular level of membership in a student organization, holding a leadership position. Like membership, leadership is associated with skill development (Schuh & Laverty, 1983; Williams & Winston, 1985) and psychosocial

development (Astin & Kent, 1983; Hood, 1984; Kuh, 1991, 1995; Williams & Winston, 1985). Leadership has also been associated with other types of development such as cognitive development and the development of humanitarian and civic values (Kuh, 1995; Kuh & Lund, 1994; Pascarella, et al., 1988). Kuh (1995) found that among seniors from 12 colleges, students credited their intellectual and personal development to their leadership experiences more often than to any other college experience.

Like members of student organizations, student leaders have reported skill gains as a result of their experiences in student organizations. These skills include teamwork (Crowder, 1999), planning, management (Crowder, 1999; Kuh, 1995; Williams & Winston, 1985), organization, and budgeting (Kuh, 1995; Schuh & Laverty, 1983). Students in one study also credited their leadership experiences with increasing their appreciation for diversity (Crowder, 1999).

Studies have also revealed psychosocial gains associated with leadership roles (Kuh, 1991, 1995; Williams & Winston, 1985). One area of psychosocial development that has been related to leadership is interpersonal competence. Studies have associated leadership with various types of interpersonal competence, such as the ability to form mature interpersonal relationships (Kuh, 1995), an increased appreciation for diversity (Crowder, 1999; Kuh, et al., 1994), and increased social skills (Williams & Winston, 1985).

Increased self esteem is another psychosocial outcome associated with holding a leadership position (Hood, 1984; Kuh, 1991; Williams & Winston, 1985). This may be particularly true for female students (Astin & Kent, 1983). Increases in self-esteem have been associated with holding varied leadership positions such as fraternity and sorority leadership positions (Williams & Winston, 1985), editing campus publications, serving on a university committee, and being the president of a student organization (Astin & Kent, 1983).

Leadership has a debatable effect on another area of development, moral development. Kuh and Lund (1994) found that students who are leaders in student government show increased moral awareness that can be solely attributed to their leadership roles. In addition, a study of a large, diverse sample of college students that used data from their freshman year (which measured pre-college values) and a follow-up self-assessment of the same students nine years after graduation, found that students' leadership experiences in college significantly affected their

values. Students who serve in leadership positions in college are more likely to value civic involvement and hold humanitarian beliefs (Pascarella, et al., 1988). These studies are contradicted in other research, however. In a study of students who belonged to Greek organizations, Marlowe and Auvenshine (1982) found that fraternity and sorority membership produces no discernible gains in moral development .

Scholars have also explored cognitive development among college students in general. Cognitive development refers to changes in the complexity of students' ways of thinking as they progress through a college or university education (Evans, et al., 1998). When cognitive development in college students is examined, several indicators of such development may be included. Some indicators are students' ability to distinguish between various types of stimuli, the complexity of students' ways of understanding events or ideas, students' ability to organize information, students' communication skills, self-image (Williams, 1994), and students' ways of making meaning out of what they learn (Baxter Magolda & Porterfield, 1988).

Research into cognitive development of student leaders and non-leaders is not as prolific as other areas of research. However, a limited number of studies have been conducted which were relevant to the present study. These studies examined such topics as measuring characteristics of leaders which may relate to cognitive development (Erwin, 1983; Howard, 1986; Vaughan, 1968), the intellectual orientation of student leaders (Springer, et al., 1995; Terenzini, et al., 1994), and levels of cognitive complexity among leaders (Kuh, 1995; Kuh, et al., 1994).

Several studies have measured attributes that may relate to cognitive development in student leaders, including grade point averages (Hartnett, 1965), and tolerance for uncertainty (Howard, 1986), as well as established measures of cognitive development (Erwin, 1983). An early study (Hartnett, 1965) showed no correlation between the degree of leaders' involvement in clubs and their grade point averages. However, Howard (1986) found that students who were leaders in college exhibit greater tolerance for uncertainty in their careers. Tolerance for uncertainty is also reflected in higher levels of cognitive development, such as relativism, in which students understand that knowledge is uncertain.

Erwin (1983) measured actual levels of cognitive development in college freshmen using a model of cognitive development that suggests that college students move from the relatively

simple level of dualism to a more complex level of relativism (Perry, 1968). He found that those freshmen who had been leaders in high school showed higher levels of cognitive development according to this scheme than those students who were members of organizations or who were not involved in any student organizations in high school. While this study offered clues about cognitive development among leaders and non-leaders in high school, it did not explore the relationship between leadership experience in college and cognitive development.

Two studies focused on influences on students' attitudes towards learning (Springer, et al., 1995; Terenzini, et al., 1994). These studies both examined in-class and out-of-class influences on students' attitudes towards learning for self-knowledge and their enjoyment of learning. In both studies, involvement outside of the classroom was measured by hours spent socializing, interpersonal relationships, and time spent attending cultural events. In both cases, students' out-of-class involvement showed a significant effect on students' attitudes, and for some variables the out-of-class effect was equal to the effect of formal classroom experiences. However, Springer, et al. (1995), showed that the number of hours a student spent participating in extracurricular clubs and organizations has no significant effect on their attitudes about learning for self-knowledge. These studies did not measure the degrees of students' involvement, such as leadership status in such clubs and organizations.

Kuh, et al. (1994), also note that many studies on out-of-class involvement and its effects on students' cognitive development tend to define out-of-class involvement as contact with professors, hours spent socializing, or time spent in other study-related activities, rather than examining the effects of holding leadership roles in clubs and organizations. However, Kuh (1995) also found that students' level of cognitive complexity may be affected by their leadership responsibilities. Leadership responsibilities were one of several antecedents to which students credit much of their gains in cognitive complexity during their college years (Kuh, 1995).

It may be difficult to relate increases in cognitive complexity to any single college experience. It may be the combination of leadership experiences, other out-of-class experiences, and in-class experiences that leads to cognitive growth (Pascarella, et al, 1993; Springer, et al, 1995; Terenzini, et al., 1994). Given the complexity of cognitive development, further discussion of cognitive development theory seems relevant.

### Relevant Cognitive Development Theory

Cognitive development theorists have tried to describe the varying degrees of cognitive complexity that exist among college students. There are numerous theories on cognitive development. The two theorists most relevant to the present study are Perry (1968) and Baxter Magolda (Baxter Magolda & Porterfield, 1988).

Perry's (1968) study of cognitive development was conducted at Harvard University and included only male participants. The study was based on a series of interviews with participants over the four years they spent in college. From these interviews, Perry established nine positions of cognitive development that he used as the constructs of his theory. These positions describe the students' movement from a dualistic point of view to a relativistic point of view. Perry's nine positions can be grouped into three major stages of development: dualism, multiplicity, and relativism (Perry, 1968).

Dualism is "the simplest set of assumptions about the nature of knowledge and values" (Perry, 1968, p. 59). In this stage, people divide the world into various sets of opposites: right and wrong, moral and immoral, those who are qualified to teach knowledge and those who are qualified only to receive knowledge (Perry, 1968). Students' insistence on a single correct answer, a single truth, and an inability to view situations in a detached manner are typical of the dualist stage of cognitive development. Dualistic learners tend to see the professor as the presenter of absolute facts and themselves as receivers of knowledge. Dualists do not see themselves or their peers as potential creators of knowledge (Evans, et al., 1998). In Perry's study, only a few subjects were found to be dualistic thinkers; many were in the process of moving from dualism to a higher stage of reasoning (Perry, 1968).

In Perry's (1968) scheme of cognitive development, students move from dualism to a stage called multiplicity. The movement from dualism to a more multiplistic stage of cognitive development involves a loss of innocence brought about by the university (Perry, 1968). In the early stages of multiplistic thinking, students perceive diverse opinions as alien to their perspectives, but not as alien to the community as a whole (Perry, 1968).

Later, students begin to understand that human knowledge and understanding of truth may be uncertain. (Perry, 1968). Students in the multiplistic stage still insist on the existence of

truth but are willing to consider that various viewpoints may have legitimacy in a confusing world. The student's dependency on authority as the source of truth decreases. Thus, as students move into the thinking styles associated with multiplicity, they are able to tolerate various viewpoints (Evans, et al., 1998).

The stage that follows multiplicity is relativism. The relativism stage of cognitive development represents a great leap in cognitive complexity and involves giving up the idea of a known truth. Students with relativistic thinking patterns are able to think critically, evaluate their own and others' viewpoints, and understand the need for opinions to be supported by facts or logical thinking. In the classroom, students view their peers, their professors, and themselves as sources of knowledge but are willing to evaluate and judge the knowledge provided by these people (Evans, et al., 1998). This stage reflects the ways students make sense out of the chaos of multiplicity. In the relativistic stage, students commit to specific ways of relating to the world. (Perry, 1968).

As students gain a relativistic perspective on the world, they begin to commit to their perspectives. They take responsibility for their own lives, examine the issues brought about by those commitments, and reaffirm their commitments. Few college students in Perry's original study could be classified as being in the commitment stage of cognitive development (Perry, 1968).

Perry's theory established a basic explanation of cognitive development among college students. However, because his study included only male participants, later researchers conducted further studies of cognitive development that included male and female participants. One of these researchers was Baxter Magolda.

Baxter Magolda's (Baxter Magolda & Porterfield, 1988) work in cognitive development theory led her to adapt Perry's scheme of cognitive development to include different perspectives on the way students may progress through his general process. Her research involved synthesizing existing research to develop six domains in which students' levels of cognitive development would be apparent. These six domains, are "decision making, the role of the learner, the role of the instructor, the role of peers, evaluation, and the nature of knowledge" (Baxter Magolda & Porterfield, 1988, p.22).

While Perry's work resulted in nine positions that could be classified into three stages of cognitive development, Baxter Magolda's work collapsed these nine positions into five positions of cognitive development, which can also be grouped into three major stages: dualism, transition, and relativism. These terms will be used throughout the remainder of this study.

In the Baxter Magolda schema, students' ways of making decisions and perceiving learning differ in the different domains (Baxter Magolda & Porterfield, 1988). For example, students' responses to questions about decision-making (Domain 1) may exemplify Position One thinking, while their responses to questions about the role of the learner (Domain 4) may exemplify Position Three thinking.

Baxter Magolda's (1988) theory proposes that each of the three different stages of cognitive development contain one or more positions that represent varying degrees of cognitive development within that stage. Positions One and Two are dualistic positions. Here, students see clear and absolute distinctions between right and wrong, perceive truth and knowledge as absolute, and see authorities as the sole source of truth and knowledge. Students making decisions in Positions One and Two seek a correct choice among their options and believe that only one of the options could be correct. In addition, students using Position One and Two reasoning see their roles as learners as passive recipients of knowledge. They see teachers as sources of knowledge and do not believe that their peers have a useful role to play in learning. Students using Positions One and Two reasoning want their grades to be based on how many correct answers they know (Baxter Magolda & Porterfield, 1988).

Positions Three and Four are known as the transition stages. In these stages, students begin to accept knowledge as uncertain, but are still convinced that all knowledge exists somewhere and one day will be discovered. The uncertainty is only temporary, and authorities are still depended upon in the search for certainty. Students making decisions using Position Three reasoning make choices based on what will yield the best results, while students using Position Four reasoning assume that all options are equally valid. This is similar to what Perry called multiplicity. Learners in these positions seek to understand knowledge or to understand what is required of them for success. They may see peers as a source of expanded understanding, and accept that there may be more than one potentially correct explanation for something. However, they are not yet ready to evaluate these explanations on their own and rely on teachers

to tell them what is necessary to learn. The role of the teacher is to clarify knowledge and peers may help in this clarification by providing new ideas. Grading, or evaluation, should be conducted by the teacher but is based on students' ability to understand material and, in Position Four, to think independently about that material (Baxter Magolda & Porterfield, 1988).

Relativism includes Position Five. In this position, students believe that truth and knowledge are relative and that there is no one source of truth and knowledge. Rather, people's ability to speak about truth and knowledge in a certain area comes from their experience in that area, and knowledge is gained by evaluating evidence about various issues. Decisions are made by weighing options, and students believe that there are some better and some worse choices among those options. Learners in Position Five have fully accepted uncertainty and seek to understand how to evaluate information. Teachers may help Position Five learners to apply knowledge and evaluate various perspectives and peers are full participants in this process. Finally, to students using Position Five reasoning, evaluation is no longer the sole responsibility of the teacher; grades should be based on mutual discussion and feedback between instructors and students (Baxter Magolda & Porterfield, 1988).

Both Perry's (1968) scheme of cognitive development and Baxter Magolda's (Baxter Magolda & Porterfield, 1988) modified scheme can be measured using several instruments. These instruments provide varying degrees of reliability and validity and contribute in different ways to understanding cognitive development.

#### Instruments That Measure Cognitive Development

There are a number of instruments that measure Perry levels (Baxter Magolda & Porterfield, 1985; Erwin, 1983; Knefelkamp, 1974; Moore, 1987; Widick, 1975). The Measure of Intellectual Development (MID) (Knefelkamp, 1974) was the first instrument designed to measure Perry levels. It evolved over the course of several years from its early incarnation as the KneWi, after its authors, Knefelkamp (1974) and Widick (1975), to its final version, the MID, which contained more open-ended questions than the earlier versions. The MID consists of sentence completion items and semi-structured essays. Participants' responses to these items are examined for cues relating to one or more Perry levels (Baxter Magolda & Porterfield, 1988).

The Scale of Intellectual Development (SID) (Erwin, 1983) was also designed to measure Perry levels among college students. It consists of four scales: dualism, relativism, commitment,

and empathy. (Erwin, 1983). The instrument, which has several formats, consists of 80-100 recognition items (Erwin, 1983; Baxter-Magolda & Porterfield, 1988). The SID is still considered to be in an experimental stage, since very little validity data have been established. (Erwin, 1983).

Another instrument that was designed to measure cognitive development is the Parker Cognitive Developmental Inventory (PCDI) (Parker, 1984). The PCDI measures only the larger categories of cognitive development, dualism, multiplicity, and relativism, and does not yield exact Perry level scores. Like the SID, the PCDI is still considered experimental (Baxter Magolda & Porterfield, 1988; Erwin, 1983; Parker, 1984); it has not been proven sufficiently valid (Baxter Magolda & Porterfield, 1988; Parker, 1984).

Another instrument designed to measure cognitive development is the Learning Environments Preference Test, or LEP (Moore, 1987). The LEP is specifically designed for use with college and university students. It consists of a list of items, each associated with a particular domain of cognitive development. Each item describes a learning environment and the respondent is asked if he or she identifies with that environment. A score is then calculated based on the cognitive complexity level revealed in the students' responses.

Several of these instruments lack sufficient reliability or validity data to be used in studies of cognitive development. The instrument used in this study, the Measure of Epistemological Reflection (MER) (Baxter Magolda & Porterfield, 1985) was developed in an attempt to improve on the lack of reliable and valid data generated by other existing instruments. It was also designed to expand Perry's research to include measures of women's cognitive development. Baxter Magolda identified six major areas in which students with different Perry levels tend to differ, which became the six domains around which the instrument is designed (Baxter Magolda & Porterfield, 1988). Protocols for determining student attitudes towards these domains were then developed, consisting of short-answer questions. The responses to these items are then rated with respect to the five positions described above. (Baxter Magolda & Porterfield, 1988). A more complete discussion of this instrument is provided in Chapter Three, Methodology.

### Research Using the Measure of Epistemological Reflection

The MER has been used to measure cognitive development in general, to evaluate the impact of certain cocurricular experiences on students, and as an outcome measurement. In terms of measuring cognitive development in general, one study examined students' MER scores across class levels and found that MER scores increased from class year to class year. Sophomores, for example, had higher MER scores than freshmen. This study supported the idea that cognitive development progresses with age as theorists predicted (Songer, 1987).

There are several studies that used the MER to evaluate the impact of co-curricular experiences on students. For example, one study used the MER to investigate the relationship between paraprofessional training, work experience, leadership experiences, and cognitive outcomes. The study found that paraprofessional training and work experience had the same impact on students' cognitive development as leadership experiences. The researcher administered the MER as a pre-test and post-test before and after these experiences and found that changes between students' pre- and post-test scores did not differ between the students participating in paraprofessional training or work experience and those in leadership roles (Rode, 1990).

The MER has been used in several studies that seek to show cognitive development as an outcome of college students' use of various student services and of their academic experiences. Baxter Magolda & Porterfield (1988) discussed an unpublished study by Straub that used the MER in a pre-test/post-test format to measure the outcomes of a leadership class. The study found no overall difference in MER scores before and after the course but did find several domain-specific changes. This study was important primarily because it established the usefulness of using the MER to measure intellectual growth that may have resulted in a short period of time, from a single academic course (Baxter Magolda & Porterfield, 1988).

Another study that employed the MER to measure outcomes examined the issue of involvement and cognitive complexity. In this case, involvement was defined as whether students had received campus services. This study found no statistically significant differences between

the MER scores of students who received campus services and those who did not (Baxter Magolda & Porterfield, 1988) .

In conclusion, there seems to be a relatively extensive body of literature on the issue of involvement and student leadership (Astin, 1977; Boyer, 1987; Carroll, 1988; Kuh, 1991; Mallinckrodt, 1988; Nelson, et al., 1984; Pascarella & Terenzini, 1991). The outcomes associated with leadership experiences in colleges have also been explored (Carroll, 1988; Mallinckrodt, 1988; Nelson, et al., 1984; Pascarella & Terenzini, 1991; Springer, et al., 1995; Astin & Kent, 1983; Pascarella, et al., 1993). Psychosocial development among student leaders and non-leaders has been explored as well (Astin & Kent, 1983; Hood, 1984; Kuh, 1991, 1995; Williams & Winston, 1985). Studies on cognitive development among student leaders are more limited (Pascarella, et al., 1993; Springer, et al., 1995, Terenzini, et al., 1994). In addition, many of the instruments used in attempts to measure cognitive development are limited by their lack of reliability and validity (Baxter Magolda & Porterfield, 1988; Erwin, 1983). The present study sought to address this gap in the existing body of literature by examining cognitive development among student leaders and non-leaders using an instrument with established reliability and validity statistics.

## Chapter Three: Methodology

The present study examined levels of cognitive development in participants who have had a leadership experience and participants who have not had that experience. The MER (Baxter Magolda & Porterfield, 1985) was administered to measure participants' levels of cognitive development along the scheme developed by Perry (1968) and modified by Baxter Magolda and Porterfield (1988).

In general, this study compared the mean scores of various groups of participants. Participants were grouped by status as leaders or non-leaders and by gender. This yielded several ways that participants could be compared: leaders versus non-leaders, female student leaders versus female non-leaders, male student leaders versus male non-leaders, female student leaders versus male student leaders, and female non-leaders versus male non-leaders. In addition, the interaction between gender and leadership status could also be studied. Specifically, the study was designed to explore the following research hypotheses:

1. There is no significant difference in the mean total MER scores of students who have had a leadership experience and those who have not had this experience.
2. There is no significant difference in the mean total MER scores of male students and female students.
3. There is no significant difference in the mean total MER scores of female students who have had a leadership experience and male students who have had a leadership experience.
4. There is no significant difference in the mean total MER scores between female students who have not had a leadership experience and male students who have not had a leadership experience.
5. There is no significant differences in the mean total MER scores of male students who have had a leadership experience and those who have not.
6. There is no significant difference in the mean total MER scores of female students who have had a leadership experience and those who have not.
7. There is no significant interaction between gender and leadership status among the participants in the study.

This chapter examines the methodology used in the present study. This includes the sample selection process, the instrument employed in the study, and the data collection and analysis procedures used in the study.

### Sample Selection

The population from which the sample was drawn included all students at a large, Research I university in the mid-Atlantic region of the United States. Part of this university's Student Activities Office is centered around leadership development for members of about 500 registered student organizations on campus as well as for students not affiliated with any of these organizations. Some examples of this office's activities include providing leadership training to organizations that request it, advising Greek letter organizations, assisting in the university's leadership theme housing program, and managing student organization finances. In addition, the office provides leadership information to any student who requests it.

The target sample of participants for this study had several characteristics. First, the researcher sought a sample size of 60 participants. Half (30) of those selected to participate were to be student leaders (SLs) and the other half were to be non-student-leaders (NSLs). In addition, the researcher wanted males and females to be equally represented in both groups. The target sample would consist of 15 female SLs, 15 male SLs, 15 female NSLs, and 15 male NSLs.

Another concern when designing the target sample was to ensure that the academic experience of the SLs matched that of the NSLs. The researcher desired that the SLs and NSLs have similar majors. The distribution of grade point averages in the two groups also was targeted to be fairly similar. Finally, the two subgroups of participants had to be of similar age and year in school.

These types of similarity were necessary for several reasons. First, maturation has an effect on cognitive development (Evans, et al., 1998), so it was important that the samples include participants with similar age distributions. In addition, cognitive development tends to increase as students progress through college (Hood, 1984), so the samples had to include participants with similar distributions of class years (e.g., freshmen, sophomores). Similarity in major field of study was desirable because students in various fields may be taught to think in ways specific to those fields. Ensuring that the two samples had similar majors would increase the likelihood that research results could not be attributed to differences in the groups' fields of

study. Finally, since gender was one of the attributes by which results would be compared, it was important that men and women be represented in equal numbers in the sample.

The researcher began by selecting the SLs. First, the term “student leader” was defined as serving as the President of a Registered Student Organization (RSO) at the time data were collected. The Student Activities Office at the institution where the study was conducted publishes a list of all RSOs annually, and generates upon request a list of the presidents of each of these organizations. The SL sample was selected from this list of the presidents of all RSOs. In 1998, there were 504 RSOs, and it was anticipated that there would be a similar number in 1999. These organizations included student government groups, Greek organizations, service organizations, and special interest groups. Since each organization is required to have a president’s name on record with the Student Activities Office, this list generated a pool of 504 SLs from whom the sample could be drawn.

The SLs were selected using a random selection process. Because part of the research involved comparison by gender, the researcher divided the list of SLs into two groups, male and female. Half of the sample was drawn from the female group and half from the male group. A total of 30 leaders were selected, including 15 males and 15 females. Female SLs were chosen first. Each leader was assigned a number, and a random number generator produced a list of 15 numbers. The female SLs whose assigned numbers corresponded with the random numbers were then invited to participate. This process was repeated to select the male SLs.

The selected sample were invited to participate via an email message sent to their individual email address. This message (see Appendix A) informed them that they had been selected to participate in a study about college students and learning. They were told that participating would entail attending one of four large group sessions during which they would be asked to complete a questionnaire about their views on learning, which would take anywhere from 30 to 60 minutes. They were also informed that an incentive would be provided for their participation: each would become eligible for one of four \$50.00 cash prizes to be given away to participants who completed the questionnaire.

The email message asked those who were interested to respond by email or phone. The researcher also contacted by phone those student leaders who had not responded after 48 hours, asking them if they wanted to participate. SLs who responded favorably via email or phone to the

invitation were contacted by phone by the researcher to obtain basic demographic information. During this phone call, the researcher obtained the participants' age and year in school (e.g., freshman, sophomore). Students were asked to identify in which of the following academic colleges at the university they were enrolled: Agriculture and Life Sciences, Architecture and Urban Studies, Arts and Sciences, Business, Engineering, Human Resources and Education, or Natural Resources. Students were also asked to place their grade point average in one of the following ranges: 0.1-1.0, 1.1-2.0, 2.1-3.0, 3.1-4.0. Finally, when a student leader accepted the invitation to participate, he or she was asked to commit to a specified time to meet with the researcher and complete the survey. The researcher attempted to group many participants together into the same time slot, but when this proved unsuccessful the researcher met with small groups and individual participants as their schedules allowed. The protocol used to screen potential participants is provided in Appendix B.

If a potential SL declined to participate, the researcher repeated the random selection process and contacted a new potential respondent of the appropriate gender. This process was repeated until 30 SLs had been selected.

After the SL sample was identified, the NSL sample was selected. The process for selecting NSLs was somewhat different than the process for selecting leaders. First, the researcher posted signs at local apartment complexes, in residence halls, and in classroom buildings around campus. The signs solicited participants for a study on college students and learning, provided information about what participation would involve, and explained the incentive for participating in the study. In addition, an advertisement was placed in the campus newspaper for one day. NSLs interested in participating in the study were asked to contact the researcher.

Interested NSLs who contacted the researcher were then screened to ensure that the sample of NSLs would be similar to the student leader sample. The same protocol used to screen SL participants was used to screen NSL participants (see Appendix B). The researcher developed profiles of NSLs who would fit the criteria of the study. Like SLs, the NSLs were asked their age, year in school, and college of enrollment. In addition to these questions, the gender of the NSLs were also ascertained to ensure that the two samples would have similar gender distributions. For example, if the SL sample included a female engineering major who was 21 years of age, a junior

in school, and who had a 3.0 grade point average, a similar NSL was identified through the screening process and asked to participate in the study. The researcher continued to screen interested NSLs until 30 participants who matched the characteristics of the SL sample had been selected to participate in the study. Each NSL participant was asked to commit to one of the four data collection sessions scheduled by the researcher. Again, this proved difficult and NSL participants were allowed to meet with the researcher in smaller groups or as individual participants as their schedules allowed.

The researcher also visited the general meetings of many clubs and organizations on campus to recruit NSLs. After the purpose of the study, the requirements for participants, and the incentives were presented to the groups, volunteers were asked to speak to the researcher after the meeting. At this time, the researcher screened the potential participants using the Participant Screening Form (See Appendix B).

#### Instrumentation

The instrument used to collect data about cognitive development level was the Measure of Epistemological Reflection or MER (Baxter Magolda & Porterfield, 1985). The MER has six sections, each organized around one of six domains that can be used to estimate a person's level of cognitive development (Baxter Magolda & Porterfield, 1985). Each section contains between three and six open-ended questions.

The first section (Domain One) of the MER examines how participants make decisions and how they view the choices open to them when making a given decision. For example, participants may have different perceptions of the options available to them. Some participants may perceive only one choice available. Other participants may identify two choices as available but only one of them as the right choice. Still other participants may see various choices available that may all be valid. This section of the MER also examines how the participants consider alternatives when making decisions. Participants are asked to describe a recent decision they made, the options from which they chose, and how they evaluated those options (Baxter Magolda & Porterfield, 1985).

The ways in which participants perceive their role in the learning process form the focus of the second section of the MER (Domain Two). Student attitudes towards their own role in the learning process are examined. For example, participants are asked if they prefer classes that

offer students factual knowledge or classes in which students are offered ideas. Responses reveal whether participants view knowledge as a set of facts to be learned or as the exchange and evaluation of ideas. Participants are also asked how they use knowledge. Respondents may see themselves as passive recipients of knowledge, they may attempt to understand the knowledge that is given to them, or they may attempt to evaluate knowledge presented in class. In this section of the instrument, participants are asked to give advice to future students about succeeding in college classrooms, and their responses to this question are used to show how participants perceive learning in college. In general, responses in this section are used to assess participants' views of the nature of knowledge and how they use knowledge. (Baxter Magolda & Porterfield, 1985).

In the third section of the MER (Domain Three) participants are asked how they perceive professors and teachers. Items in the third section include one in which participants describe their favorite teachers and what they learned from those teachers. Participants at various levels in Domain Three may see teachers as providers of information, clarifiers of information, or as people who enable the student to understand or create information on their own. This domain examines how participants get information and what responsibilities they prefer their instructors to assume (Baxter Magolda & Porterfield, 1985).

The fourth section of the MER examines Domain Four, how participants perceive the role of fellow students in the learning process. To elicit this information, the instrument asks participants if they prefer classes in which there is a lot of peer participation or if they prefer less peer participation. In general, this domain measures whether the participants view their peers as legitimate sources of knowledge (Baxter Magolda & Porterfield, 1985).

Grading and evaluation are the focus of the fifth section of the MER (Domain Five). The items in this section ask respondents to discuss the ways in which evaluation of learning should be conducted and who is qualified to carry out that evaluation. (Baxter Magolda & Porterfield, 1985). To elicit this information, students are asked about the relationship between hard work and grades, what they think grades should be based upon, and why they chose that basis for grading.

The sixth section of the MER (Domain Six) examines two issues. The first is how participants perceive knowledge. Second, this section measures how participants prefer to

evaluate knowledge. To elicit this information, participants are asked whether it is possible for two professors who explain a certain event differently to be equally right, and how the participants go about evaluating which instructor is correct (Baxter Magolda & Porterfield, 1985).

MER scores show to which position of cognitive development the respondent has been assigned. This score may be a one, two, three, four, or five. The score represents a consensus between the two raters who each assign scores to respondents separately and then come to consensus on the respondents' final scores. Scores of one or two reflect dualistic tendencies in respondents, scores of three or four show transitional tendencies, and scores of five reflect relativism.

In summary, the MER elicits information about how students view learning and knowledge. Students' levels of cognitive development are evaluated by how they answer series of questions in six sections of the instrument, each dealing with an aspect of the learning process. These aspects include decision-making, the roles of professors, peers, and the learner, evaluation and grading, and the nature of knowledge. A copy of the MER is provided in Appendix C.

#### Reliability and Validity of the Measure of Epistemological Reflection

After designing and piloting the MER, Baxter Magolda tested various aspects of its reliability and validity in a series of studies. These included two studies based on two different samples of Teacher Education participants. Two other studies were based on participants in a tutoring program; one examined the students being tutored, the other the tutors themselves. Other studies employed a variety of students. One examined students majoring in social work, another utilized a sample of graduate students in an education program, and a third used a sample of residence hall students. A final study used a random sample of student participants.

#### Reliability

Reliability relates to the extent to which an instrument consistently measures a phenomenon when administered at different times or administered to different groups of people (Gall, Borg, & Gall, 1996). The MER was found to have a high degree of reliability (Baxter Magolda & Porterfield, 1988). The primary way that Baxter Magolda tested reliability was through interrater agreement and interrater reliability. Two raters always score the MER.

Responses on the MER are short answers, so agreement between the raters depends on how they interpret the text of respondents' answers.

Baxter Magolda (1988) evaluated the interrater agreement on all MER domains on all samples employed in the pilot studies. She examined two types of interrater agreement, exact agreement and within-one-position agreement. Exact agreement occurred when two raters assigned the same participant precisely the same scores within a domain or on the overall instrument. Within-one-position agreement occurred when two raters assigned the same participant scores that differed only by one position on a given domain or on the overall score (Baxter Magolda & Porterfield, 1988). It is important to note that while each domain was found to be statistically significant in the determination of levels of cognitive development, it is only in the combination of domain scores that the respondents' levels of cognitive development can be accurately measured. An individual domain score does not equate to a specific level of cognitive development.

Exact interrater agreement for Domain One, decision making, ranged from 31% in the second sample of teacher education participants to 70% in the study of tutors. Within-one position agreement for Domain One ranged from 47 % in the second teacher education sample to 95% in the tutoring client sample and graduate student sample. Baxter Magolda noted that even the lowest scores on interrater reliability provide statistically significant levels of agreement, meaning that Domain One scores contribute to the evaluation of respondents' levels of cognitive development (Baxter Magolda & Porterfield, 1988).

Exact interrater agreement for Domain Two, the Role of the Learner in the Learning Process, ranged from 51% in the study of graduate participants to 83% in study of tutors. Within-one position agreement ranged from 80% in the second sample of teacher education participants to 97% in the tutor study (Baxter Magolda & Porterfield, 1988). These are statistically significant levels of agreement, meaning that Domain Two scores can be used in the evaluation of respondents' levels of cognitive development.

Exact interrater agreement for Domain Three, the Role of the Instructor in the Learning Process, ranged from 56% in the graduate student sample to 76% in the tutor sample. Within-one-position agreement for Domain Three ranged from 85% in the graduate student sample to 100% in the tutor study (Baxter Magolda & Porterfield, 1988). Interrater agreement in Domain

Three was statistically significant, meaning that Domain Three scores may be used in combination with other domain scores to measure levels of cognitive development.

Exact agreement between raters on Domain Four, the Role of Peers in the Learning Process, ranged from 46% in the second teacher education sample to 74% in the tutor sample. Within-one-position agreement for Domain Four ranged from 83% in the second teacher education sample to 97% in the tutor sample (Baxter Magolda & Porterfield, 1988). These levels of agreement are statistically significant, so Domain Four scores can be used in determining levels of cognitive development in respondents.

In Domain Five, the Role of Evaluation in the Learning Process, exact interrater agreement ranged from 44% in the graduate student sample to 67% in the tutoring client sample. Within-one-position agreement for Domain Five ranged from 77% in the graduate student sample to 93% in the tutor sample (Baxter Magolda & Porterfield, 1988). These statistically significant levels of agreement ensure that Domain Five scores can be used, along with other domain scores, in ascertaining cognitive development levels among respondents.

Exact interrater agreement for Domain Six, the Nature of Knowledge, Truth, and Reality, ranged from 48% in the second teacher education sample to 66% in the first teacher education sample. Within-one-position agreement for Domain Six ranged from 72% in the second teacher education sample to 90% in the tutor sample (Baxter Magolda & Porterfield, 1988). Though lower than in the other domains, the exact interrater agreement levels are still statistically significant in the determination of Perry levels, as are the within-one-position levels of agreement.

The lowest exact interrater agreement for total scores on the MER was 46% in the second teacher education sample, while the highest agreement was 80%, in the tutor study. Within-one-position agreement for total scores ranged from 89% in the second teacher education sample to 100% in the social work, tutor, and graduate student samples (Baxter Magolda & Porterfield, 1988). All of these figures were found to be statistically significant, meaning that the MER yields reliable measures of cognitive development levels.

Baxter Magolda also considered other types of reliability when she evaluated the MER for total protocol reliability. One of these methods was a statistical analysis of interrater agreement. In this method of analysis, the closer the reliability coefficient is to 1.0, the stronger

the reliability of the instrument. Interrater reliability coefficients for the MER ranged from .59 in the study of tutoring participants to .81 in the study of a random sample of participants and the study that used graduate participants (Baxter Magolda & Porterfield, 1988). These reliability coefficients suggested a reasonably high degree of reliability.

Another type of reliability that was measured was internal consistency, which examines whether individual responses to different questions that probe the same information are similar. (Gall, et al., 1996). Cronbach's alpha was used to test for internal consistency. Cronbach's alpha coefficients for the MER ranged from .60 for the study of social work participants and the study of tutoring participants to .84 for the study that used graduate participants (Baxter Magolda & Porterfield, 1988). These findings support the contention that the MER is a reliable instrument.

### Validity

Validity relates to the extent to which an instrument measures what it purports to measure (Gall, et al., 1996). Baxter Magolda evaluated the validity of the MER by comparing MER scores with levels of cognitive development determined by an interview process. Interviews represent an established way of determining cognitive development. Perry used interviews to gauge his participants' levels of cognitive development when he developed his theory (Perry, 1968), but Baxter Magolda developed a more specific interview protocol for her study. The resulting scores from the interview method and the MER were then compared to discover if interviewers assigned participants scores similar to those produced when participants completed the MER. The reliability statistics for the two methods proved to be very similar, which means that although the MER is more structured than Perry's interviews were, the increased structure does not change students' diagnosed levels of cognitive development. (Baxter Magolda & Porterfield, 1988)

In addition, Baxter Magolda examined the mean levels of cognitive development in all samples used in pilot studies and sorted them according to respondents' year in school. In general, freshmen in all the studies scored similarly, as did sophomores, juniors, and seniors. This similarity enhances the validity of the instrument (Baxter Magolda & Porterfield, 1988).

In summary, the MER was found to have sufficient validity in measuring cognitive development. Because the MER yields results similar to other established measures of cognitive development, it can be used in research such as the present study with a reasonable certainty of obtaining meaningful results.

### Data Collection Procedures

The researcher sought permission from the university's Institutional Review Board for Research Involving Human Subjects at the institution where the study was conducted before gathering the data. Once approval was obtained, the sample was selected and the data collection began.

Participants from the two samples were asked to attend one of three data collection sessions organized by the researcher. Three data collection sessions were held to accommodate the participants' schedules. The data collection sessions were held in residence hall classrooms and seminar rooms around the campus where the study was conducted.. The sessions were held on a variety of days at a variety of times to facilitate participation. Specific data collection dates included Thursday, November 11, at 2:30 a.m., Monday, November 15, at 8 p.m., and Tuesday, November 16, at 8 p.m. When scheduling all the participants into a few sessions proved difficult, the researcher also scheduled smaller group meetings with a few students and individual meetings with the remainder of the participants.

All 60 participants were asked which data collection session they planned to attend at the time they were screened to participate in the study. If they could not attend one of the four large group sessions, a separate time was scheduled. As a result, the researcher had a list of participants planning to attend each of the four large group sessions or a small group or individual session. The researcher assigned a code to each participant which identified their gender (M=Male, F=Female), leader status (SL=leader, NSL=non-leader), and their participant number (e.g., 01, 02, 03). This rendered a series of participant codes. For example, the first male student leader was assigned the code MSL01, while the first female non-leader was assigned the code FNSL01. This ensured that participant responses to the MER would be confidential and no one other than the researcher would be able to identify which participants provided which responses. This was important because the MERs had to be scored by outside raters.

At the beginning of each session or individual meeting, each participant was greeted by the researcher and his or her identity was ascertained. After a student's identity was ascertained, he or she was crossed off the list of participants indicating that he or she had come to a data collection session. After this greeting process, the participant was handed a packet of materials that was coded to correspond to their participant identification code (e.g. MSL01, FNSL01). The

packet contained a copy of the MER and an informed consent letter. The informed consent form addressed such topics as confidentiality, the process of the prize drawing, and brief instructions for completing the MER. Participants were then instructed to be seated.

Once all participants had been provided their coded packets and had been seated, the researcher explained to the respondents that they were participating in a study about how students think about learning. The researcher then explained each part of the materials to the participants. The informed consent form thanked them for participating and told them of the rules of the drawing for the \$50.00 incentives. Participants were told they needed to sign and submit this form along with their completed MER at the end of the session. Finally, the researcher explained the MER to the participants. Participants were told that the MER asked for responses to a number of different questions that dealt with such things as decision-making, classes they like and dislike, how they think grading should be done, and other educational experiences. Participants were then asked to complete the MER. Participants were told that they should use short answers or paragraphs to answer each item to the best of their ability, and that they could use additional space on the reverse side of the pages of the instrument if they desired to give longer answers. Participants were given approximately one hour to complete the MER, the time recommended for this task (Baxter Magolda & Porterfield, 1988).

At the end of each session, participants handed their completed instruments and informed consent forms back to the researcher. The researcher verified that the informed consent form had been signed and that the participant had responded to all items on the MER. The informed consent form was then separated from the instrument and retained by the researcher to ensure the confidentiality of respondents was maintained. The only identifying information left on the instruments was the code assigned to each instrument by the researcher.

The researcher retained a list of participants' names and the code number of the instrument that that participant completed. The name of the participant who had completed the instrument was then entered into the list of names from which the winners of the \$50.00 prize would be selected. This drawing took place the week after the data collection sessions were concluded, and winners were issued their prizes by the researcher.

Once all participants had completed the MER, the instruments were sent to qualified MER raters. A list of raters was obtained from the author of the instrument. The researcher

contacted several of these raters until two raters were employed to score all the instruments completed by participants. These raters scored the instruments, providing the researcher with individual domain scores and total MER scores for each respondent. After the instruments were scored, the raters returned them to the researcher for analysis.

#### Data Analysis Procedures

Two qualified raters scored the instruments and the results were returned to the researcher. Each participant was assigned domain scores for each individual section of the instrument which were then used to determine his or her total MER score. For example, a participant could have been scored as being in Position Three on Domain One, but Position Two when his or her responses to all domains were analyzed. Total MER scores represented an overall level of cognitive development for the participant.

The data were analyzed to examine the statistical hypotheses posed in the study. To investigate these hypotheses, the researcher conducted a series of ANOVAs. Overall MER scores were assigned to groups, a mean overall score for each group was calculated, and a univariate ANOVA was conducted to reveal whether there were significant differences between mean scores.

For example, the first hypothesis posed in the study was designed to explore differences in mean MER scores between SLs and NSLs. The researcher sorted overall MER scores into two groups: those of SLs and those of NSLs. Then, the researcher calculated the mean overall MER score for SLs by summing the individual total scores of the 30 SL participants and dividing that total by 30 (the number of SLs in the group). This yielded a mean overall MER score for SLs. This process was repeated to calculate the mean overall MER score for NSLs. Then, a univariate ANOVA was conducted to investigate whether there was a significant difference in these two mean scores.

This process was repeated to test the second, third, fourth, fifth, and sixth hypotheses posed in the study. First, overall scores were assigned to groups (i.e., female leaders versus female non-leaders, male leaders versus male non-leaders; female leaders versus male leaders; female non-leaders versus male non-leaders). Next, mean overall MER scores were calculated for each group. Univariate ANOVAs were conducted to look for significant differences in mean

scores between groups. Finally, ANOVA analysis was also used to examine differences by the interactive effects of the variables (leadership status and gender).

In conclusion, the purpose of this study was to examine differences in levels of cognitive reasoning between and among SLs and NSLs. The methodology described in this chapter was deemed sufficient to address the hypotheses posed in the study.

## Chapter Four: Results

This chapter reports the findings of the study. First, a few minor changes in data collection procedures are reported. Then, a description of the sample is provided. Finally, the analysis of the seven null hypotheses is examined.

### Procedures

The researcher originally planned to conduct meetings with multiple participants during which the participants would complete the MER. However, due to time constraints on the part of individual participants, the researcher allowed participants to complete the instrument individually. Individual meetings with the researcher were scheduled, during which the participants completed the MER in the researcher's office.

Additionally, the sample selection process took longer than the researcher originally anticipated. While the collection of data was expected to conclude in early November 1999, it actually did not conclude until February 2000. These changes in the data collection procedures did not unduly influence the outcome of the study, however.

### Description of the Sample

A total of 60 students participated in the study. Because of the pre-screening process and the manner in which instruments were completed, no data had to be discarded. During the pre-screening process, information was collected which would allow the researcher to match leaders with non-leaders based on information about the student's leader status, year in school, grade point average, and major area of study. The researcher also checked each completed survey as it was submitted to ensure that it was completely filled out. All students who met the criteria for participation completed the instrument satisfactorily. The demographic characteristics of the sample are provided in Table 1.

Fifty percent (50%) of the participants were male and 50% were female. The respondents were divided into two groups, those who had had a leadership experience and those who had not. Fifty percent (50%) of the leaders were male and 50% were female. Likewise, the non-leaders were equally divided between male and female participants.

Table 1

Characteristics of the Sample (N=60)

Characteristic	<u>Leaders</u>		<u>Non-leaders</u>	
	n	% of sample	n	% of sample
<b>Gender</b>				
Male	15	25	15	25
Female	15	25	15	25
<b>Year in School</b>				
Freshman	0	0	0	0
Sophomore	2	3.33	2	3.33
Junior	7	11.67	7	11.67
Senior	21	35	21	35
<b>Grade Point Average</b>				
3.1-4.0	18	30	18	30
2.1-3.0	12	20	12	20
1.1-2.0	0	0	0	0
0.1-1.0	0	0	0	0
<b>Major Area</b>				
Business	11	18.33	11	18.33
Science/Engineering	14	23.33	14	23.33
Social Sciences	5	8.33	5	8.33

No freshman students participated in this study, because freshman students were unlikely to have had a leadership experience in college. Four sophomores participated, representing 6.66% of the respondents. Two of these were leaders and two were non-leaders. Fourteen participants, or 23.34%, were juniors. Seven of these were leaders and seven were non-leaders. Seniors accounted for 70% of the total participants. Twenty-one (21) senior leaders and 21 senior non-leaders participated.

Sixty percent (60%) of the participants reported that their Grade Point Average (GPA) fell in the range of 3.1-4.0. Eighteen (18) leaders and 18 non-leaders reported GPAs in this range. The remaining 40% of participants reported that their GPAs fell in the 2.1-3.0 range. Twelve (12) leaders and 12 non-leaders reported GPAs within this range.

Students reported their academic majors, and the researcher grouped these majors into three types: business, science/engineering, and social sciences. The “business” category included all participants with accounting, finance, management, and similar courses of study. Participants in all types of engineering studies, as well as math, chemistry, physics, and similar areas comprised the “science/engineering” group. Those students studying such areas as sociology, communication, human services, and similar fields were grouped together in the “social sciences” category. No participants reported majors outside these three areas; for example, no music majors participated.

Twenty-two (22) business majors participated, for a total of 36.66% of all participants. Eleven (11) of these business majors were in the leader category and 11 were in the non-leader category. The science/engineering category represented 46.66% of all participants, including 14 student leaders and 14 non-leaders. Five (5) leaders and five (5) non-leaders were grouped in the social sciences category, representing 16.66% of all the participants.

#### Data Analysis

This study examined the possible relationships between gender, leadership status, and cognitive development in college students at a large research institution. Students were asked to complete an instrument that consisted of several open-ended questions. Their responses were then scored by trained raters and numerical representations of participants' cognitive

Table 2

Results of ANOVAs Examining Cognitive Level by Main and Interaction Effects (N=60)

Effect	Sample	mean	sd	df	F	P
Leadership Status				59	7.573	.008*
Leaders	30	3.130	.294			
Non-leaders	30	2.934	.257			
Gender				59	.206	.652
Men	30	3.049	.340			
Women	30	3.015	.238			
Gender Among Leaders				29	.392	.536
Men	15	3.164	.359			
Women	15	3.096	.219			
Gender Among Non-Leaders				29	.000	.994
Men	15	2.934	.287			
Women	15	2.933	.235			
Gender Between Leadership Status				29	3.763	.063
Male Leaders	15	3.164	.359			
Male Non-Leaders	15	2.934	.267			
Gender Between Leadership Status				29	3.856	.06
Female Leaders	15	3.096	.219			
Female Non-Leaders	15	2.933	.234			
Gender and Leadership Status				1	.217	.643
Male Leaders	15	3.164	.359			
Male Non-Leaders	15	2.934	.287			
Female Leaders	15	3.096	.219			
Female Non-Leaders	15	2.933	.235			

\* = significant at the .05 level

development levels were produced. The sample of non-leaders was matched to the leader sample by gender, year in school, grade point average, and major area of study.

The hypotheses examined the relationship between gender, leadership status, and MER score of the participants. To explore these hypotheses, a series of 7 ANOVAs ( $p < .05$ ) was conducted to examine the main effects (leadership status, gender) and the interaction effect (leadership status and gender) on cognitive development among and between groups.. Results are described below, and details are provided in Table 2.

#### Leadership Status

A significant relationship was found between status as a leader and cognitive development. The MER scores of those students who had had a leadership experience were significantly higher than the scores of the group of students who had not had such an experience.

#### Gender

There was no significant difference between gender and cognitive development. When the mean of all males' scores was compared with the mean of all females' scores, no significant difference emerged.

#### Leaders' Scores by Gender

When the mean score of the male leaders was compared to the mean score of the female leaders, no significant difference was shown. This suggests no significant difference in cognitive development levels among leaders.

#### Non-leaders' Scores by Gender

When the mean score of the male non-leaders was compared to the mean score of the female non-leaders, no significant difference emerged. Again, this suggests no significant difference in cognitive development levels among non-leaders.

#### Males' Scores by Leadership Status

No significant difference was revealed between the mean score of the male leaders and the mean score of the male non-leaders. It may be worth noting, however, that the P-value for this comparison was .063. Had the level of significance been established at the .10 level, this would have been a significant finding.

Females' Scores by Leadership Status

As with the male group, there was no significant difference between the mean scores of the female leaders and the main scores of the female non-leaders. Again, however, the probability of the F statistic was .06. Had the researcher used a .10 level of significance, this finding would have been meaningful.

Gender and Leadership Status

The researcher also looked for an interactive effect between students' gender and their status as leader on their MER scores. No significant effect occurred.

These findings suggest some interesting patterns. The meaning of these results, and their implications for future research and practice, are discussed in the final chapter of this study.

## Chapter Five: Discussion and Implications

This chapter discusses the results of the study and their implications for future research and practice. First, the findings are discussed in light of the hypotheses posed in the study. Then, the findings are discussed in relationship to prior research on leadership and cognitive development. Next, the researcher presents implications for future research and practice. Finally, conclusions about student leaders and non-leaders and their cognitive development are presented.

### Discussion

The first research hypothesis considered in this study explored the effect of leadership status on mean MER scores. Participants who had had a leadership experience, defined as being president of a registered student organization, were compared to a matched sample of those who had not had this experience. When the mean score of all leaders was compared with the mean score of non-leaders, student leaders proved to have a significantly higher mean score on the MER than their non-leader counterparts. The mean score for the student leader group was 3.130, while the mean score for non-leaders was 2.934. This was significant at the .05 level.

The student leaders' mean MER score reflected a slightly higher level of cognitive development than did the mean score of the non-leader group. The student leaders' mean score reflects a level of cognitive development known as Position Three, or the transition stage. In this stage, students begin to accept knowledge as uncertain, but are still convinced that all knowledge exists somewhere and one day will be discovered. The uncertainty is only temporary, and authorities are still depended upon in the search for certainty (Baxter Magolda and Porterfield, 1988).

Students making decisions using Position Three reasoning make choices based on what will yield the best results for them. Learners in these positions seek to understand knowledge or to understand what is required of them for success. They may see peers as a source of expanded understanding, and accept that there may be more than one potentially correct explanation for something. However, they are not yet ready to evaluate these explanations on their own and rely on teachers to tell them what is necessary to learn. The role of the teacher is to clarify knowledge and peers may help in this clarification by providing new ideas. Grading, or evaluation, should be

conducted by the teacher but is based on students' ability to understand material (Baxter Magolda and Porterfield, 1988)

In this study, students who were not organization presidents, the non-leader subgroup of the sample, reported an average score of 2.934 on the MER, placing them in Baxter Magolda's (1988) Position Two. This is a dualistic perspective. In this position, students see clear and absolute distinctions between right and wrong, perceive truth and knowledge as absolute, and see authorities as the sole source of truth and knowledge. When making decisions, Position 2 students tend to seek a correct choice among their options and believe that only one of the options could be correct. In addition, they see their roles as learners as passive recipients of knowledge. They see teachers as sources of knowledge and do not believe that their peers have a useful role to play in learning. These students want their grades to be based on how many correct answers they know (Baxter Magolda & Porterfield, 1988).

These results suggest that leadership status is an important effect to consider when examining cognitive development among college students. There are several possible explanations for these results. The first is that college student leaders are exposed to a variety of situations and experiences that their non-leader counterparts have not experienced, and these situations may have affected the leaders' cognitive development in some way. For example, student leaders who are required to seek input from a variety of different types of students when making decisions may be more exposed to different opinions on issues. They may be better able to see how some of those differing opinions are equally valid. The ability to identify multiple points of view may have affected their cognitive development level.

A second explanation for the higher level of cognitive development among student leaders might be that the development of various thinking skills has been linked to leadership development experiences (Pascarella, et al., 1993). The student leaders in this study may have had such leadership development experiences, which may have had an impact on their thinking skills. For example, the institution where this research was conducted offers a summer leadership class for presidents of student organizations. This class includes sessions on diversity, understanding various leadership styles, and developing a personal definition of leadership. These activities encourage students to develop their own perspective on leadership and introduce student leaders to a diverse group of their peers. The institution also offers a yearly diversity

workshop which student leaders are encouraged to attend. These experiences might help student leaders develop a more multiplistic viewpoint because they introduce student leaders to a wide range of opinions on leadership and diversity. Many of these activities also encourage student leaders to develop their own sense of knowledge and truth about leadership. These thinking skills may have then influenced participants' responses to the questions on the MER.

Finally, students who exhibit higher cognitive development levels may be more drawn to leadership positions by virtue of the fact that they see themselves and their peers as legitimate sources of knowledge. These students may be more likely than other students to enter leadership positions in which they try to affect university policy or public opinion. Unlike students who are not drawn to leadership positions, leaders may see themselves and their opinions as potential sources of knowledge. Although they may not perceive their contributions to the search for truth as equal to those of professors or university administrators, they understand that they can play a role in the search.

It is also possible to examine these results by considering the possible reasons that the non-leaders exhibited lower levels of cognitive development than did the leaders. The first possible explanation is that non-leaders may not have been exposed to the variety of situations and experiences to which the leaders may have been exposed. The lack of opportunity to be responsible for an organization and to make judgments for that organization may have affected the non-leaders' cognitive development in some way. In addition, non-leaders may not have had the same opportunity to develop thinking skills as their leader counterparts. As noted in the discussion of the first hypothesis, the development of various thinking skills has been linked to leadership development experiences (Pascarella, et al., 1993). The non-leaders in this study may never have had the chance to develop these skills, which may have had an impact on their MER results. Also, students who exhibit lower cognitive development might not be drawn to leadership positions that require higher-level thinking skills.

The second hypothesis in the present study concerned the mean MER scores for all male participants and all female participants. The mean scores that emerged were not significantly different. Both groups' scores indicated that the members of the groups used Position Three reasoning when answering the questions of the MER.

One possible explanation for this finding may be that if one eliminates the issue of leadership experience and considers only gender differences, the experiences of the two groups may not differ substantially. That is, perhaps the participants shared similar experiences overall and those experiences resulted in similar levels of cognitive development.

The mean total MER scores of male leaders versus those of female leaders were considered in the third hypothesis. As with male and female participants in general, there was no significant difference between the male leaders' scores and those of the female leaders. Both groups' scores fell within the range of Position Three, or multiplistic thinking. Both men and women leaders exhibited tendencies to understand that knowledge is uncertain and that they and their peers can participate in the search for knowledge.

The lack of significant differences in leaders' scores by gender on the MER suggests that gender does not make a difference in student leaders' levels of cognitive development. Male and female students seem to receive equal benefits from their leadership experience in terms of cognitive development.

There are several possible explanations for this finding. The first is that the leadership experience may not differ between the genders, and so has the same effect on both genders. Male and female leaders complete many of the same tasks, such as leading meetings and making decisions about their organizations' activities. The similarities in the activities of male and female leaders may lead to similarities in their cognitive development levels.

Another explanation may be that the institution where the research was conducted does not have separate leadership development programs for men and women; no gender-targeted programs exist. Since all programs are open to both male and female leaders, and since leaders from both sexes participate in these programs, it is likely that the effect of leadership development programs is equally distributed between male and female leaders and no difference in level of cognitive develop should be expected.

The fourth hypothesis compared the female non-leaders with the male non-leaders. As with their leader counterparts, no significant difference occurred. Both groups' scores reflected a dualistic, or Position Two, perspective. This indicates that both male and female members of the non-leader group tended not to view themselves as contributors in the search for truth and that they preferred to take their knowledge from an authoritative source.

There may be various reasons for this lack of gender differences among the non-leaders. The educational experiences of the men and women selected for the sample may have been fairly similar, with no experiences that would lead either men or women to reach higher levels of cognitive development. For example, their coursework could have been very similar, with each group taking classes that encourage Position Two thinking. Another reason might be that the male and female non-leaders may have had similar out-of-class experiences that led their cognitive development levels to be similar. For example, many of both the men and women were recruited from club and organization meetings. This similar experience, being a member of a club or organization, may have had an equal impact on the two groups and led them to have similar levels of cognitive development.

The fifth hypothesis examined the mean total MER scores of male students who have had a leadership experience and the scores of those males who have not had such an experience. The mean total MER scores of these two groups are all clustered around the 3.0 mark, with male student leaders slightly higher and male non-leaders slightly lower. However, the differences were not statistically significant at the .05 level. On the whole, the male participants were somewhere between the dualistic perspective of Position Two and the more multiplistic perspective of Position Three.

The fact that male leaders and male non-leaders were so closely matched by GPA, year in school, and major area of study may account for some of this similarity. These factors may have outweighed any influence that the leadership experience may have had on MER scores. Another reason that the scores might have been so similar is that many of the non-leaders who participated in the study were members of a club or organization. As noted in the methodology section of this study, participants were recruited from clubs and organizations. It has been shown that some benefits may accrue to members of clubs and organizations development (Kuh, 1991; Schuh & Laverty, 1983; Williams & Winston, 1985); for the students in this study, these benefits may have included a slightly increased level of cognitive development.

It is also important to note that if a different level of significance, for example the .10 level, had been used, there would have been a significant difference in the MER scores of male leaders and non-leaders. There are several reasons why this difference might exist. The first is that the male leaders may have taken advantage of the leadership development programs

discussed above. They may have taken the summer leadership class, participated in workshops, or had other meaningful interactions with leadership development personnel. These interactions may have affected the cognitive development levels of the male leaders. Second, the experiences of leading an organization may have made the male leaders more open to other points of view than their non-leader counterparts who have not completed any of the tasks that the leaders have completed. Finally, the male leaders may have been more attracted to leadership roles because of higher levels of cognitive development before taking on those roles. Like the leaders in general, those males who became leaders may have been predisposed to accept themselves and their peers as sources of knowledge and authority. This different understanding of knowledge may have led them to become leaders, where they could voice their sense of knowledge and the truth. Likewise, the male non-leaders may have opted not to become leaders because they did not see themselves or their peers as valid sources of knowledge or authority.

The sixth hypothesis examined the mean MER scores of female students who had had a leadership experience and the mean MER scores of those females who had not had such an experience. No significant difference was found between these two groups. The scores of the female participants in this study, like those of the male students, were closely centered around a score of 3.0. Female student leaders scored slightly higher than female non-leaders. Again, the differences were not statistically significant. The female participants were somewhere between the dualistic perspective of Position Two and the more multiplistic perspective of Position Three.

The explanation for this may be the same as it is for the closeness in the male participants' scores. Many of the participants came from clubs and organizations. They may have derived some of the same benefits as their leaders from this status as members, which may have affected their MER scores. Additionally, the subgroups were matched by GPA, major area of study, and year in school. As with the male subgroups, the female subgroups' experiences in their academic lives may have been sufficiently similar to outweigh any differences related to leadership experiences.

As in the comparison of male leaders and male non-leaders, however, if the researcher had used the .10 level of significance when studying female leaders versus female non-leaders, these results would have been statistically significant. Female leaders may have different levels of cognitive development than female non-leaders for much the same reasons that male leaders

may be higher than male non-leaders. Their experience as leaders may have led them to develop a greater appreciation of diverse viewpoints and they may be more willing to consider these viewpoints as sources of knowledge and understanding. Next, if female leaders participated in the leadership development opportunities offered at the institution where the research was conducted, they may have had experiences that contributed to their cognitive development. Finally, differences in levels of cognitive development may have been a determinant of which female participants became involved in leadership. The leaders may have been drawn to positions of leadership because they viewed themselves and their classmates as contributors to knowledge and as valid sources of authority. At the same time, the non-leaders may not have perceived themselves as able to have a voice in their club or organization and so declined to take on leadership roles.

The seventh hypothesis explored the interaction between gender and leadership status on cognitive development. No significant results were found. It appears that the interaction of gender and leadership status has no effect on the mean MER scores of any of the groups.

The reasons for this may be similar to the reasons that neither male leaders' or female leaders' mean scores were significantly higher than the mean scores of the non-leader group for each gender. Gender, overall, was not a significant factor in mean score. It may therefore be expected that it would not have a meaningful interaction with leadership status. Again, gender may not be a factor at the institution where the research was conducted due to the fact that no leadership programs there target either gender specifically or exclusively. The similarity of tasks carried out by male and female leaders (and the similar lack thereof among non-leaders of both genders) may also have affected these results.

Finally, it should be noted that there may have been outlying scores that affected the ANOVA calculations for all of these hypotheses. It seems odd that while the leaders' mean score was higher than that of the non-leaders, no other group was significantly different from any other. This may have been due to the presence of an outlier, someone who scored either much higher or much lower than any of the other participants. A cursory review of the raw data revealed at least one such outlier. The score of one male leader was higher than the scores of most other participants. It is possible that this outlier, or others like it, might have influenced the findings.

### Relationship of Findings to Prior Research

This research yielded similar results to several studies that have been done about leadership and cognitive development. However, the results of this study also differed slightly from some other studies' results.

The difference between the leaders' and non-leaders' mean MER scores in the present study is consistent with other studies conducted about cognitive development among student leaders. Several studies have measured attributes that may relate to cognitive development in student leaders. Hartnett (1968) found that student leaders had higher grade point averages than non-leaders. Another indicator of cognitive development is tolerance for uncertainty, which Howard (1986) found in greater levels among student leaders. The findings in the present study also enhance earlier findings (Erwin, 1983) that college freshmen who had been leaders in high school demonstrated higher levels of cognitive development than their counterparts who had had no such experience in high school. Erwin based his study on the Perry scheme of cognitive development, one of the models used in the present study. The present study also indicates that students who have had a leadership experience, albeit on a different level than Erwin's subjects, have higher levels of cognitive development than students who have not had a leadership experience.

This research may also corroborate previous studies that examined such topics as measuring characteristics of leaders which may relate to cognitive development (Erwin, 1983; Howard, 1986; Vaughan, 1968), the intellectual orientation of student leaders (Springer, et al., 1995; Terenzini, et al., 1994), and levels of cognitive complexity among leaders (Kuh, 1995; Kuh, et al., 1994). Kuh (1995) found that students' level of cognitive complexity may be affected by their leadership responsibilities. Leadership responsibilities are one of several antecedents that students credit for their gains in cognitive complexity during their college years (Kuh, 1995). All of these studies reveal connections between cognitive development and the experience of being a leader, which is reported in the present study. It would seem that the results of this study are additional evidence of positive gains among students who participate in leadership experiences in college.

While the present study supported findings of some previous investigations, the results also confound at least one prior study regarding involvement and learning. Springer, et al. (1995) reported that the number of hours students spend participating in extracurricular clubs and organizations has no significant effect on their attitudes about learning for self-knowledge. However, the Springer study did not measure the degrees of students' involvement, such as leadership status in such clubs and organizations. Therefore, it would seem that the Springer study does not refute the results of the present study, nor does the present study refute Springer's findings. Springer, et al.'s work (1995) merely considered the question of learning and involvement differently than it has been considered in this research.

#### Implications of the Study

This study has implications for future research and practice. The results generated by this study indicate that further study of cognitive development in student leaders and non-leaders is desirable. The results are also interesting for several constituencies of student affairs practitioners and those students who receive their services.

The results of the present study suggest that further studies of cognitive development are warranted. These studies may take several forms. First, the lack of a significant difference in cognitive levels between male students and female students may provide an interesting starting place for research. While other studies suggest that gender bias may exist in classroom learning situations, (Brady & Eisler, 1995), this study reveals that in one out-of-class learning situation, the leadership experience, both genders may gain equal benefits. Future scholars may wish to explore gender and cognitive development more fully.

Second, further research might be conducted about how student leaders utilize their higher levels of cognitive development. It would be interesting to know if student leaders use higher-order thinking skills in their jobs as leaders, in the classroom, or in other settings. Student affairs practitioners could use these results to ensure that leaders are using their mental skills to their greatest capacity.

Third, future studies should examine whether the same cognitive development benefits accrue to other executive officers of organizations. The present study examined only those students who were Presidents of organizations. Other studies could investigate cognitive development levels of other officers, such as Vice Presidents or Treasurers. Such a study might

provide a broader understanding of similarities and differences in students who hold various leadership positions and those who hold none.

Fourth, research may be conducted into levels of cognitive development among the leaders of various types of student groups, such as governance organizations, fraternities and sororities, and academic clubs. The present study did not examine differences in levels of cognitive development by type of organization. Such a study might reveal whether or not students involved in one type of organization display higher levels of cognitive development than students involved in other types of organizations.

This study also has implications for future practice among educators and college students. First, student affairs practitioners who work with student leaders may use the results of this study to design interventions for their clients. If these professionals know the developmental levels of their leaders, they can design more appropriate interventions for student leaders around those levels. Knowing the present developmental level of student leaders would help leadership development experts to encourage these leaders to move to the next level of cognitive development. They can do this through the use of “plus-one staging.”

It has been shown that students can deal well with information that is one level above their own current developmental levels. This is called “plus-one staging” and is a developmental technique in which the student affairs professional presents students with information requiring them to use thinking skills one level above the one currently used by the students. Students can understand and even enjoy using thinking styles one level above their own (Evans, et al., 1998). Through challenging students to move up a level, the student affairs practitioner brings about increased levels of development in the students.

Administrators could use this concept in combination with the data about students’ developmental levels presented in this study. For example, administrators might offer a program that encourages student leaders to move from Position Three thinking to Position Four thinking. Administrators might offer, for example, program about decision-making for student leaders. Students in Position Three use different criteria for making decisions than do students in Position Four. Students making decisions using Position Three reasoning make choices based on what will yield the best results, while students using Position Four reasoning assume that all options are equally valid. A program designed to move students from Position Three to Position Four

could include exercises that give students a hypothetical decision and ask them to list reasons why a number of options could work based on reasoning other than the good each option might yield.

Second, in-class educators at universities may be interested in the results of this study. They may wish to adopt some of the educational techniques of student affairs practitioners who work with student leaders in order to try to bring about increased cognitive development among their students, many of whom may not be campus leaders. For example, professors in areas like history, political science, and international studies could encourage students to disagree about reasons for contemporary events. Allowing students to form their own opinions and learn to defend those opinions could encourage students to see themselves as sources of knowledge, which may help those students increase their cognitive development levels.

Third, potential student leaders may be interested in the results of this study. They may see the benefits that student leaders receive in terms of cognitive development. This may encourage more students to take on leadership roles in hopes of achieving similar cognitive development.

Finally, students who have had a leadership experience may find the results of this study useful. Since this study demonstrated that student leaders show higher levels of cognitive development, student leaders may use this information to obtain advantages in the job market or in pursuing further higher education opportunities. Showing that they belong to a group that has been demonstrated to think at a higher level may be advantageous for these students.

Student activities and leadership development professionals could also use the results of this study to benefit non-leaders. This study generated data about the cognitive development level of non-leaders. Leadership development offices may have as one of their purposes teaching leadership skills to potential leaders. Knowing that non-leaders have slightly lower levels of cognitive development could help these professionals design interventions to bring non-leaders up to the level of leaders, using the same plus-one staging techniques described above. Helping non-leaders develop their ability to perceive themselves as useful sources of knowledge could increase the number of students interested in leadership positions on campus.

Another option for a program that leadership development offices could offer as a result of this study would be a mentoring program for leaders and non-leaders. Non-leaders interested

in leadership could be paired with leaders as their mentors. This is a variation on the theme of plus-one staging. Exposing non-leaders, who may be primarily Position Two thinkers, to leaders, who may be primarily Position Three thinkers, may help the non-leaders increase their level of cognitive development as a result of the time they spend with student leaders. This would prepare non-leaders interested in leadership to take on a leadership position in which they could utilize their new skills.

Leadership development professionals could also use the results of this study to market themselves to non-leaders. If non-leaders were aware that being a leader might increase their cognitive development levels, more non-leaders might be willing to participate in leadership development activities. Leadership development offices could form marketing campaigns around the benefits of higher levels of cognitive development that may be related to leadership experiences. For example, such offices could tell students that participation in their programs may help them develop skills such as understanding diverse opinions that will be useful to them in both campus leadership and in the business world.

The results of this study may also be beneficial to leadership development offices in terms of budgets and competition for scarce funds. Demonstrating that student leaders show higher levels of cognitive development than non-leaders could enable professionals in leadership development programs to argue for more money in order to enhance cognitive development and student learning for more students.

#### Limitations

This study had some limitations. One of these limitations is related to the technique used to match the leader sample with non-leaders. Broad categories were used when matching participants by grade point average. Students were matched by the following grade point average ranges: 3.1-4.0, 2.1-3.0, 1.1-2.0, and 0.1-1.0. If more precise matching was used, the results might have differed.

A similar limitation involves the broad categories for major area of study. Participants in this study were categorized into only three types of major areas: business, science and engineering, and social sciences. If the sample had been more precisely matched or included representatives of more diverse majors, for example language majors or fine arts majors, the results may have differed.

A third limitation may have come from the nature of the instrument. Students may have been unprepared to complete such a complex instrument that required handwritten responses. Their responses may have been unnecessarily abbreviated because they had to hand-write them. If this occurred, the results might have been influenced.

A fourth limitation is related to the sampling procedure. All participants were volunteers. This is always a limit in sampling design since these volunteers may have differed in some important way from non-volunteers that influenced the results in some unforeseen manner.

The final limitation comes from the rating process used to score the MERs. The author of the MER has recently unveiled a new, more comprehensive scoring procedure that may yield more accurate results. This procedure is more qualitative than the present quantitative method. If the study had been conducted using the new rating procedure, the results may have been affected.

In spite of these limitations, this study provided important information about student leaders and non-leaders. Most studies that have been conducted regarding student development among leaders have examined psychosocial development or skill development, not cognitive development. Also, many prior studies did not focus specifically on student leaders but rather on involved students versus non-involved students. The present study was conducted with an uncommon level of specificity in defining leadership roles. The information presented in this study provides student affairs practitioners and others with an improved understanding of student leaders.

This study showed that college student leaders demonstrate a higher level of cognitive development than non-student-leaders. In general, then, it would seem that there is a relationship between serving as the president of a student organization and level of cognitive development. However, the results are perhaps more interesting in terms of what was not revealed in the findings. That is, there were no significant differences within groups by gender or between groups by gender. It would seem, therefore, that greater efforts to promote cognitive development among students in general are needed.

Student learning has become a major focus of student affairs work in recent years. This study suggests that cognitive development among student leaders is higher than cognitive development among non-leaders. The results of this study may help leadership programs address students' and parents' concerns about learning useful things in college. The ability to think at a

more complex level is a desired outcome of a college education, and this study helps to show that such abilities may develop outside the classroom as well as inside the classroom.

## References

- Academic Senate for California Community Colleges. (1998). Performance based funding: A faculty critique and action agenda. (Eric Document Reproduction Service No. ED 421 192)
- Almanac. (1999). Chronicle of Higher Education.
- Almanac. (1976). Chronicle of Higher Education.
- Akerheim, K, Berger, J., Hooker, M., & Wise, D. (1998). Factors related to college enrollment: Final report. National Education Longitudinal Study, Mathtech Incorporated. (Eric Document Reproduction Service No. ED 421 053)
- Altbach, P. G. (1993). Students: Interests, culture, and activism. In A. Levine (Ed.), Higher Learning in America: 1980-2000. (pp. 3-19). Baltimore: Johns Hopkins University.
- American College Personnel Association (1994). The Student Learning Imperative. No city given: American College Personnel Association.
- Arnold, C. L. & Ugale, R. (1996). Student outcomes report: The latest numbers and recent trends in student success, withdrawal, persistence. (Eric Document Reproduction Service No. ED 421 196)
- Astin, A. (1977). Four critical years: Effects of college on beliefs, attitudes, and knowledge. San Francisco: Jossey-Bass.
- Astin, A. (1997). What matters in college: Four critical years revisited. San Francisco: Jossey-Bass.
- Astin, H. S. & Kent, K. (1983). Gender Roles in Transition: Research and Policy Implications for Higher Education. Journal of Higher Education, 54, 309-324.
- Baxter Magolda, M. B., & Porterfield, W. D. (1988). Assessing intellectual development: The link between theory and practice. No city given: American College Personnel Association.
- Baxter Magolda, M. B., & Porterfield, W. D. (1985). Measure of Epistemological Reflection. No city given.
- Benjamin, R. (1998). Looming deficits: Causes, consequences, and cures. Change, 30 (2), March/April 1998, pp. 12-17.

Boyer, E. (1987). College: The undergraduate experience in America. New York: Harper & Row.

Brady, K. L., & Eisler, R. M. (1995). Gender bias in the college classroom: A critical review of the literature and implications for future research. Journal of Research and Development in Education 29 (1), 9-19.

Burke, J. C. (1998). Performance budgeting and funding: Making results count where it matters. Assessment Update 10 (5), 1.

Callan, P. (1993). Government and higher education. In A. Levine (Ed.), Higher Learning in America: 1980-2000. (pp. 3-19). Baltimore: Johns Hopkins University.

Carroll, J. (1988). Freshman retention and attrition factors at a predominantly black urban community college. Journal of College Student Development, 29, 52-60.

Crowder, M. (1999). 1998-1999 Student Leadership Outcomes Inventory. (Available from Melinda Crowder, University Unions and Student Activities, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061).

Erwin, T. D. (1983). The scale of intellectual development: Measuring Perry's scheme. Journal of College Student Personnel, 24, 6-12.

Evans, N. J., Forney, D. S., & Guido-Dibrito, F. (1998). Student development in college: Theory, research, and practice. San Francisco: Jossey-Bass.

Gaither, G. H. (1997). Performance indicator systems as instruments for assessment and accountability. Assessment Update 9 (1), 1.

Gall, M. D., Borg, W. R., & Gall, J. P. (1996). Educational research: An introduction. White Plains, N. Y.: Longman Publishers USA.

Hartnett, R. T. (1965). Involvement in extracurricular activities as a factor in academic performance. Journal of College Student Personnel, 6, 272-274.

Hood, A. B. (1984). Student development: Does participation affect growth? ACU-I Bulletin, 52 (6), pp. 16-19.

Howard, H. (1986). College experience and managerial performance. Journal of Applied Psychology, 71, 530-552.

Hyman, R., Beeler, K. J., & Benedict, L. G. (1994). Outcomes assessment and student affairs: New roles and expectations. NASPA Journal, 32, 20-30.

Johnson, R. E. (1998). Where consumer has become king. Trusteeship, 6 (2), March/April 1998, pp. 26-29.

Knefelkamp, L. L. (1974). Developmental instructions: Fostering intellectual and personal growth of college students. Dissertation Abstracts International, 36 1271A. (University Microfilms No. 75-21).

Kuh, G. D. (1991). Involving colleges. San Francisco: Jossey-Bass Publishers.

Kuh, G. D. (1995). The other curriculum: out-of-class experiences associated with student learning and personal development. Journal of Higher Education, 66, 123-155.

Kuh, G. D., Douglas K. B., Lund, J. P., & Ramin-Gyurnak, J. (1994). Student learning outside the classroom: Transcending artificial boundaries. ASHE-ERIC Higher Education Report No. 8. Washington, D. C.: The George Washington University, School of Education and Human Development.

Kuh, G. D. & Lund, J. P. (1994). What students gain from participating in student government. In M. C. Terrell & M. J. Cuyjet (Eds.). Developing Student Government Leadership. New Directions for Student Services no. 66. San Francisco: Jossey-Bass Publishers.

Mallinckdrodt, B. (1988). Student retention, social support, and dropout intention: Comparison of black and white students. Journal of College Student Development, 29, 60-64.

Marlowe, A. F. & Auvenshine, C. D. (1982). Greek membership: Its impact on the moral development of college freshmen. Journal of College Student Personnel 23, 153-57.

Marwick, J. D. (1998). Academic outcomes assessment: A tool for student learning. Program Description, University of Illinois, Urbana-Champaign. (Eric Document No. Reproduction Service No. ED 422 991)

McCain, A. K., Hine, T., & Wolfertz, J. (1998). Educational outcomes and competencies across the curriculum. (Eric Document Reproduction Service No. ED 421 184)

Mellander, G. A., & Mellander, N. (1997). "Trends in community college education: A window of opportunity." Paper presented at Seton Hall University Higher Education Conference. South Orange, NJ, October 31, 1997.

Moore, W. S. (1987). An overview of the learning environment preferences: A recognition measure of the Perry scheme of intellectual development. Olympia, Washington: Center for the Study of Intellectual Development.

Nelson, R., Scott, T., & Bryan, W. (1984). Precollege characteristics and early college experiences as predictors of freshman year persistence. Journal of College Student Personnel, 25, 50-54.

Pace, C. R. (1987). Good things go together. Los Angeles: University of California - Los Angeles, Center for the Study of Evaluation.

Parker, J. C. (1984). The preliminary investigation of the Parker Cognitive Development Inventory. (Doctoral dissertation, 1984). Dissertation Abstracts International, 45, 2849A.

Pascarella, E. T. (1987). The influence of college on self-concept: A consideration of race and gender differences. American Educational Research Journal, 24 (1), 49-77.

Pascarella, E. T. (1989). The development of critical thinking: Does college make a difference? Journal of College Student Development, 30, 19-26.

Pascarella, E. T., Bohr, L., Nora, A., Zusman, B., Inman, P., & Desler, M. (1993). Cognitive impacts of living on campus versus commuting to college. Journal of College Student Development, 34, 216-220.

Pascarella, E. T., Ethington, C. A., & Smart, J. C. (1988). Influence of college on humanitarian and civic involvement values. Journal of Higher Education, 59, 412-437.

Pascarella, E. T., & Terenzini, P. (1991). How college affects students. San Francisco: Jossey-Bass Publishers.

Perry, W. G., Jr. (1968). Intellectual and ethical development in the college years: A scheme. New York: Holt, Rinehart, and Winston.

Rode, D. L. (1990). Effects of paraprofessional training and work experience on the cognitive development of college students (Doctoral dissertation, Northern Illinois University, 1990). Dissertation Abstracts International, 51, Z5055.

Schilling, K. M., & Schilling, K. L. (1998). Proclaiming and Sustaining Excellence: Assessment as a Faculty Role. ASHE-ERIC Higher Education Report Volume 26 No. 3. Washington, D.C.: The George Washington University, Graduate School of Education and Human Development.

Schuh, J. H., & Laverty, M. (1983). The perceived long-term benefits of holding a significant student leadership position. Journal of College Student Personnel 24(1), 28-32.

Serban, A. (1998). The performance funding wave: Views of state policymakers and campus leaders. Assessment Update 10 (2),1.

Songer, H. L. (1987). Differences in cognitive development scores across levels of quality of effort, grade averages, and college class (Doctoral dissertation, Kansas State University, 1990). Dissertation Abstracts International, 49, Z5055.

Springer L., Terenzini, P., Pascarella E. T., & Nora, A. (1995). Influences on college students' orientation toward learning for self-understanding. Journal of College Student Development, 36 (1), 5-18.

Terenzini, P., Springer L., Pascarella E. T., & Nora, A. (1994). In and out-of-class influences affecting the development of students' intellectual orientations. Review of Higher Education 19, 23-44.

Vaughan, R. P. (1968). Involvement in extracurricular activities and dropout. Journal of College Student Personnel, 9, 60-61.

Widick, C. (1975). An evaluation of developmental instruction in a university setting. Dissertation Abstracts International, 36 2041A. (University Microfilms No. 75-21).

Williams, M., & Winston, R. B. Jr. (1985). Participation in organized student activities and work: Differences in developmental task achievement of traditional-aged college students. NASPA Journal 22 (3), pp. 52-57.

Williams, S. L. (1994). Developing and testing a sorting measure of interpersonal cognitive complexity. Paper presented at the Annual Meeting of the Speech Communication Association, New Orleans, LA.

Woodard, D. B. Jr., Hyman, R., von Destinon, M., & Jamison, A. (1991). Student affairs and outcomes assessment: A national survey. NASPA Journal, 29, 17-23.

Appendices

Appendix A:

Email Sent to Potential Student Leader Participants

Appendix A: Email message sent to potential student leader participants.

Subject line: Win \$50.00!

Body of message:

Dear [name goes here],

You have been selected to participate in a study about college students and learning. By participating you could win \$50.00 in cash!

Being a part of this study involves only about an hour of your time. To participate, you will attend one of four sessions, during which you will be asked to fill out a questionnaire about your views on learning. Completing this questionnaire takes from 30 to 60 minutes

Now, about that \$50.00 in cash -- by attending one of the sessions, you are automatically entered in a drawing for one of four \$50.00 prizes. If your name is drawn, you can pick up your prize anytime the week after the drawing is held. Only about 60 students will be participating, so your chances of winning are 1 in 15!

If you are interested in participating, please respond to this email or give me a call at 961-5606 or 231-5552. If you are willing to participate, you can choose which session to attend (I'll provide you with all the details of when and where), and I will ask you a few questions about your major, age, year in school, and so forth.

This study has been approved by Virginia Tech's Institutional Research Board. Thanks so much for your time, and I hope you will participate!

Sincerely,

Cara Skeat

Graduate Student, Higher Education and Student Affairs

Appendix B:  
Protocol Used to Screen Potential Participants

Appendix B: Protocol Used to Screen Potential Participants

Name: \_\_\_\_\_

Phone #: \_\_\_\_\_

Email: \_\_\_\_\_

Age: \_\_\_\_\_

Year in School:      Freshman      Sophomore      Junior      Senior

GPA Range:    1.0-1.5      1.6-2.0      2.1-2.5      2.6-3.0      3.1-3.5      3.6-4.0

Major: \_\_\_\_\_

Leader? (Organization President \_\_\_\_\_)

Non-leader?

Status: Invited to Participate \_\_\_\_\_

Not invited \_\_\_\_\_

Data Collection Session:      Nov. 11, 2:30 pm

Nov. 15, 8 p.m.

Nov. 16, 8 p.m.

Participant Code \_\_\_\_\_

Appendix C:  
The Measure of Epistemological Reflection

Appendix C:  
The Measure of Epistemological Reflection

Due to copyright restrictions, the MER cannot be obtained here. It may be obtained from its author.