ABSTRACT

Title of Dissertation:	Group Involvement Experiences in College: Identifying a Thematic Taxonomy
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The purpose of this study was to explore whether latent phenomena could be identified to assist in the classification of students into subgroups based on their patterns of involvement across 21 types of co-curricular group experiences (e.g., cultural groups, student governance, club sports). Further analysis attempted to establish whether the emergent taxonomy of subgroups truly discriminated among students. This was accomplished through the use of data from the Multi-Institutional Study of Leadership, a national research program examining the influences of higher education on college student leadership development. The sample was comprised of 11,209 seniors from 50 institutions across the United States. The primary research question employed exploratory latent class analysis as a means to determine the number of latent factors underlying student patterns of involvement. A total of four latent factors were identified and students were classified into one of eight latent classes interpreted to reflect: Affinity Group Affiliates, Identity and Expression Leaders, Academic Careerists, Cultural Collegiates, Athletes, Social Recreators, Recreational Academics, and Social Collegiates. Findings from secondary research questions contributed to the validity of the taxonomy by demonstrating differential

influences of latent class membership on a theoretically-derived measure of leadership. Significant relationships were also identified between latent classes and the demographic variables of race and gender.

Results suggested a more complex composition of the category of collegiate identified in numerous taxonomies of college students (Astin, 1993a; Clark & Trow, 1966; Kuh, Hu & Vesper, 2000). Findings also served as a response to the numerous calls for research examining patterns of student involvement in co-curricular group experiences (Gellin, 2003; Foubert & Grainger, 2006; Hernandez, Hogan, Hathaway, & Lovell, 1999; Hoffman, 2002; Moore, Lovell, McGann, & Wyrick, 1998; Renn & Bilodeau, 2005a). Results have implications for both higher education research and professional practice. This includes the provision of new analytic and conceptual approaches for studying college student populations as well as college impact. Findings may also serve as a useful heuristic tool to assist student affairs professionals in their advising and mentoring of college students.

GROUP INVOLVEMENT EXPERIENCES IN COLLEGE: IDENTIFYING A THEMATIC TAXONOMY

By

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Dissertation submitted to the Faculty of the Graduate School of the
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Dedication

This work is dedicated to my grandmother, Agnes Broderick, a person of exceptional compassion, character, fortitude, and an inspiration for me in all that I do.

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The completion of this dissertation is as much the accomplishment of the wonderful community of friends and family to which I belong as it is my own. I cannot thank my family enough for their unending support and encouragement. I am lucky to have been blessed by extraordinary parents that are as much friends as role models and caregivers. Gratitude is owed to my sisters, Geri and Erin, for their unwavering affirmations and generous spirits. I also must thank my grandma and aunt for always being there to listen and for supporting me unconditionally. Finally, I have to thank Roberto, who has become part of our family. His gentle and not so gentle prodding is what kept me on track and reminded me how much was in store once this was completed. One plus one certainly equals two.

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CHAPTER 1: PROBLEM AND CONTEXT

Estimates indicate over 50% of college students participate in some type of co-curricular group involvement experience by the end of their senior year (National Survey of Student Engagement [NSSE], 2006). Further research suggests that peers are the most powerful source of influence on student educational gains (Astin, 1993b; Newcomb, 1962; Pascarella & Terenzini, 2005) and through the context of student group experiences, developmental progress across critical educational outcomes such as leadership development can be achieved (Cress, Astin, Zimmerman-Oster, & Burkhardt, 2001; Kezar & Moriarty, 2000; Smart, Ethington, Riggs, & Thompson, 2002; Zimmerman-Oster & Burkhardt, 1999). However, inquiry into the role involvement in co-curricular group experiences plays in advancing educational outcomes continues to be conducted at either the macro-level (i.e., examining involvement in student clubs and organizations in general), the micro-level (i.e., examining involvement in highly specific student groups or organizations), or using a scattershot approach (i.e., examining involvement across what appear to be randomly selected group experiences). Research also fails to take into account the differential impact of various types of group experiences or how patterns of involvement shape educational gains (Gellin, 2003; Foubert & Grainger, 2006; Hernandez, Hogan, Hathaway, & Lovell, 1999; Hoffman, 2002; Moore, Lovell, McGann, & Wyrick, 1998; Renn & Bilodeau, 2005a). This significantly limits the transferability of this research to practice as well as across diverse institutional types. As the educational climate in higher education continues to focus more on the measurement of student learning (Association of American Colleges & Universities, 2007; National

Association of Student Personnel Administrators & American College Personnel Association [NASPA & ACPA], 2004; U.S. Department of Education, 2006), understanding this link between involvement in student group experiences and educational gains, particularly in the area of leadership development, could provide important information for the design and delivery of educationally meaningful programs and services.

This chapter provides an introduction to the topic of student involvement in co-curricular group experiences and its influence on leadership development. Leadership development is selected as an outcome of interest given its centrality to group experiences (Northhouse, 2006). This is accomplished by providing a brief synthesis of existing theoretical and empirical literature on the topic. The chapter also outlines the problem statement and research questions associated with this research study. Key terms are identified throughout, and the significance of the research is presented. Finally, the chapter provides a summary of the methods employed in this investigation.

The Concept of Involvement

The impact of college on students has received considerable attention and been a major focus of higher education research for several decades (Astin, 1993b; Feldman & Newcomb, 1969; Pascarella & Terenzini, 1991, 2005). Substantial inquiry is directed at understanding how involvement in the college environment in general, and participation in co-curricular group experiences in particular, shape educational outcomes (Astin, 1984; Kuh, 2001; Kuh, Kinzie, Schuh, Whitt, & Associates, 2005; Pace, 1984). For the purposes of this study, co-curricular group experiences were

defined as membership in student clubs and organizations (e.g., student government, debate team, student newspaper, social sorority) or experiences in which the individual has high degrees of peer to peer contact due to an established reference group (e.g., living-learning programs) (Newcomb,1962; Weidman, 1989). Much of the research on this topic is predicated on an evolving conceptualization of what it means to be involved and how that involvement in turn shapes the ways in which students learn (Astin, 1985). Early interpretations of the concept were hypothesized by Pace and focused on determining the quality of effort students expend within the collegiate environment. In other words, to what extent do students take advantage of the educational opportunities afforded them and how much time is spent in these activities (Pace)? This conceptualization was expanded by Astin (1984) who posited a theory of student involvement that combined the behavioral aspects of Pace's work with psychological dimensions. Astin (1984) asserted that "student involvement refers to the quantity and quality of the physical and psychological energy that students invest in the college experience" (p. 528). His work on student involvement is frequently employed as a theoretical framework and is the basis for extensive research (Astin, 1993b; Flowers, 2004; Hernandez et al., 1999; Moore et al., 1998; Pascarella & Terenzini, 2005). As such, his definition for student involvement was adopted in this study.

Despite the popularity of Astin's (1984) model, his conceptualization of what entails student involvement, along with those of other researchers (NSSE, 2006; Pace, 1984), tend to be broad and encompass a wide-array of experiences within the collegiate environment. Several theorists, however, provide frameworks useful in

narrowing involvement from its broad definition to more specific types that demonstrate the greatest positive influence on educational outcomes. The early work of Newcomb (1962) suggested that who one associates with in college significantly impacts the overall experience and that peer interactions are one of the single most potent influences on students' attitudes and beliefs. Weidman (1989), who explored the process of undergraduate socialization, affirmed this statement in his model, which highlights the ways in which peer normative pressure exerts influence on students' values, attitudes, and goals. Both of these works suggest the powerful role that peer interactions play on growth and development, a finding later validated by Astin (1996) when he cited involvement in peer groups as one of the strongest influences on student development. The above works situate involvement in co-curricular group experiences as a potentially critical influence on educational gains, especially when taken in conjunction with the large number of students that report having these experiences at some point during their college career (NSSE, 2006).

Research on Involvement in Group Experiences

Numerous studies have linked broadly defined involvement in co-curricular group experiences to gains in student learning (Astin, 1993b; Dugan, 2006b; Fitch, 1991; Foubert & Grainger, 2006; Gellin, 2003; Hernandez et al., 1999; Kezar & Moriarty, 2000; Martin, 2000; Moore et al., 1998; Terenzini, Pascarella, & Blimling, 1996). Benefits are documented across a wide array of educational outcomes including: cognitive development (Gellin; Inman & Pascarella, 1998; Whitt, Edison, Pascarella, Nora, & Terenzini, 1999), psychosocial development (Cooper, Healy, & Simpson, 1994; Foubert & Grainger; Martin), identity development (Harper &

Quaye, 2007; Hurtado, Milem, Clayton-Pedersen, & Allen, 1999; McClure, 2006), career-related skills (Astin; Whitt et al.), and educational attainment/ persistence (Beil, Reisen, Zea, & Caplan, 1999; Berger & Milem, 1999; Leppel, 2002; Titus, 2004). Research has also been conducted on the influence of involvement in co-curricular group experiences on leadership development with results suggesting positive gains (Astin; Cress et al., 2001; Kezar & Moriarty; Smart et al., 2002). Additional studies (Antonio, 2001; Dugan, 2006b; Kezar & Moriarty; Posner, 2004; Renn & Bilodeau, 2005a; Thompson, 2006) have explored the influence of particular types of group experiences (e.g., student government, community service, participation in formal leadership training programs, athletics, social fraternity and sorority membership) on various measures of leadership. Results vary from experience to experience with certain co-curricular group experiences (e.g., community service, formal training programs) regularly demonstrating positive associations with leadership development (Pascarella & Terenzini, 2005). However, most of this research fails to use theoretically-derived measures of leadership relying instead on conceptualizations of the phenomena that may not be consistent with current theoretical interpretations (Dugan, 2006a, 2006b). This is problematic given the key role institutions of higher education play in shaping the leadership capacity so needed in broader society (Astin & Astin, 2000; Morse, 1989; Roberts, 2003).

Leadership as a Key College Outcome

It has been suggested that "helping students develop the integrity and strength of character that prepare them for leadership may be one of the most challenging and important goals of higher education" (King, 1997, p. 87). Further evidence of the

importance of leadership competence lies in its inclusion in institutional mission statements and the increased presence of leadership development programs on college campuses (Astin & Astin, 2000; Council for the Advancement of Standards in Higher Education, 2003; Zimmerman-Oster & Burkhardt, 1999). More recently, there have been resounding calls to incorporate leadership development in more concrete ways as a key college outcome (Astin & Astin; NASPA & ACPA, 2004; Roberts, 2003).

Research indicates that college students can and do increase their leadership skills during the college years (Pascarella & Terenzini, 2005), and that this increase can be attributed in part to collegiate involvement (Astin, 1993b). However, research on the influence of involvement in group experiences on college student leadership development is constrained by several key limitations. First, research in which college students serve as the primary population of study is a relatively recent phenomenon in the area of leadership development, which drastically limits knowledge on how group experiences shape outcomes (Avolio et al., 2005). Undergraduates are often used in empirical leadership research to test hypotheses about theories designed for other populations, but little attention is spent on them as a unique group of study. An estimated 65% of research on leadership development interventions conducted over the last 100 years used undergraduate students as primary participants, yet few of these studies were designed to directly serve the college student population, and thus findings were not interpreted in the context of student development literature (Avolio et al.). This failure to consider college student data in the context of existing theory on the population contributes to a significant gap in concrete knowledge about college student needs as they relate to leadership

development. Second, there exists a dearth of empirical research examining conditional effects that moderate the influence of involvement in group experiences on leadership development (Avolio et al; Pascarella, 2006; Pascarella & Terenzini). To assume that unique differences do not exist based on student characteristics (e.g., race, sexual orientation, gender, subculture) is not only fallacious, but also contrary to the deep values of diversity and multiculturalism central to student affairs practice (El-Khawas, 2003; Hurtado et al., 1999; Washington, 2005). Third, most research conducted on college students employs atheoretical, general measures of leadership rather than those tied specifically to conceptual models designed for the population (Dugan, 2006a, 2006b). The result is a lack of cohesiveness in research findings relating to leadership development with each study utilizing its own definitional parameters and measurement tools. Furthermore, some studies use definitional parameters to measure leadership that are inconsistent with current theoretical understandings of the phenomenon (Astin, 1993b; Smart et al., 2002). For example, Astin (1993b) included perceived popularity and social self-confidence in his measures of leadership, concepts that are wholly inconsistent with how leadership is understood today. This reduces the number of broad implications that can be drawn regarding the influences of student group experiences on leadership development in college.

Leadership Defined

The evolution of thought regarding leadership is as complex as the phenomena itself. A review of the literature on its definition reveals that there are nearly as many as those who have studied it (Bass, 1990; Rost, 1991). Nonetheless,

there emerges a clear intellectual progression in these definitions that contribute to a variety of classifications of types of leadership theory and ultimately two distinct paradigms, the industrial (i.e., management oriented, leader-centric models) and the post-industrial (i.e., relational, reciprocal, values-based models) (Rost, 1991). Post-industrial models reflect contemporary leadership philosophies examining leadership as a group and relational process (e.g., Komives, Lucas, & McMahon, 2007; Wheatley, 2006); the role of shared leadership, collaborative processes, and transformational change (e.g., Burns, 1978; Rost, 1993; Yukl, 2005); ethics and character (e.g., Ciulla, 1998; Terry, 1993); and positive and authentic approaches to leadership (Avolio & Gardner, 2005; Clifton & Nelson, 1992). The post-industrial models of leadership listed above are largely derived from the organizational context. However, the last two decades have given rise to a number of models and theories specifically designed to serve the unique needs of college students. These include the leadership challenge model measured by the Student Leadership Practices Inventory (Posner, 2004; Posner & Brodsky, 1992), the social change model of leadership development (Higher Education Research Institute [HERI], 1996), the relational leadership model (Komives, Lucas, & McMahon, 1998), and the leadership identity development model (Komives, Longerbeam, Owen, Mainella, & Osteen, 2006). All of the above models are consistent with the values associated with the post-industrial leadership paradigm and can be applied in a variety of ways to practice. However, the social change model of leadership development (HERI) was adopted specifically for use in this study given its identification as one of the most widely-used student

leadership models (Kezar, Carducci, & Contreras-McGavin, 2006; Moriarty & Kezar, 2000).

The social change model (HERI, 1996) was designed specifically for the college student population and is grounded in two core principles. First, leadership is believed to be inherently tied to social responsibility and manifested in creating change for the common good (HERI). Second, the model is predicated on increasing individuals' levels of self-knowledge and capacity to work collaboratively with others (HERI). This is accomplished by assisting students in growth across seven critical values (i.e., consciousness of self, congruence, commitment, collaboration, common purpose, controversy with civility, and citizenship), which in turn contribute to an eighth value of change for the common good (HERI). These values interact dynamically across three levels: individual (i.e., consciousness of self, congruence, and commitment), group (i.e., collaboration, common purpose, and controversy with civility), and society (i.e., citizenship). The social change model defines leadership as a purposeful, collaborative, values-based process that results in positive social change (Dugan & Komives, 2007; HERI).

Statement of Problem

Literature and research on co-curricular group involvement experiences often suggest a direct relationship with college student success (Pascarella & Terenzini, 2005). However, research on this topic is often polarized in its design. Some researchers (e.g., Magolda & Ebben, 2006; McLure, 2006; Pike, 2003) report the unique benefits of a specific type of involvement (e.g., social fraternities, cultural organizations, residence hall councils) without accounting for how concurrent

involvement in other group experiences may contribute to learning as well. Although this research is important, it has the potential to overestimate the influence of the student group experience as well as present non-applicable findings should schools not have similar group experiences on their campuses. Other researchers report findings for involvement in co-curricular group experiences broadly (e.g., Flowers, 2004; Foubert & Grainger, 2006; Lundberg, Schreiner, Hovaguimian, Miller, 2007), which limits the ability of practitioners to target interventions given parameters are not placed around how involvement is defined. Finally, some researchers take a more scattershot approach to studying involvement by selecting a seemingly random set of group experiences to evaluate (Kezar & Moriarty, 2000; Pascarella, Pierson, Wolniak, & Terenzini, 2004; Thompson, 2006). These sets of experiences are often constructed in relation to the researchers' central hypotheses, as an attempt to capture breadth of involvement, or using knowledge of the student sample prior to the investigation. However, the approach still fails to accurately capture the full range of patterns of involvement and can contribute to confounded results in which overall effects as well as unique contributions remain unclear. Given the above, the reduction of student patterns of involvement across co-curricular group experiences into a thematic taxonomy could provide a valuable middle ground for use in both research and practice. This framework could then be applied in college impact research design models to better understand the influence of student group experiences on educational outcomes such as leadership development.

The purpose of this study was to explore whether or not latent phenomena could be identified to assist in the classification of students into subgroups based on

their patterns of involvement across 21 types of co-curricular group experiences (e.g., political groups, student governance, club sports). Further analyses attempted to establish whether or not subgroups from the emergent taxonomy truly discriminated among students. The study served as a direct response to Kuh's (1995) call for an increase in research on student cultures and the link between behaviors and characteristics associated with these cultures and educational outcomes. Additionally, it provided the opportunity to explore in more depth the category of college student typically referred to as collegiates in the literature (Astin, 1993a; Clark & Trow, 1966; Kuh, Hu, & Vesper, 2000). The specific research questions informing this study included:

1) Do underlying, latent dimensions differentiate between patterns of student involvement across 21 types of co-curricular group experiences and can they be used for classification of students into subgroups?
2) Are there significant differences between subgroups on a theoretical measure of leadership development?
3) Are there significant relationships between key demographic characteristics (i.e., race and gender) and student subgroups?

Significance of Study

Results from this study contribute significantly to the understanding of patterns of college student involvement in group experiences and student subcultures that result from these patterns. First, it provides a direct response to the numerous calls for a more detailed examination of student involvement in co-curricular group experiences that takes into account patterns of involvement across multiple

experiences as well as differential influences between experiences (Gellin, 2003; Foubert & Grainger, 2006; Hernandez et al., 1999; Hoffman, 2002; Moore et al., 1998; Renn & Bilodeau, 2005a). Second, the study results in a taxonomy describing patterns of student involvement across co-curricular group experiences that builds upon and complements existing taxonomies attempting to describe characteristics of college students (e.g., Astin, 1993a; Clark & Trow, 1966; Kuh et al., 2000). Results from this study specifically provide a more detailed examination of the student subpopulation typically labeled collegiates, or those students that generally report high levels of student involvement in co-curricular group experiences (Clark & Trow; Maw, 1971). Additionally, dependent indicator variables used to construct the taxonomy were limited only to student group experiences rather than including a broad laundry list of variables relating to involvement. The exclusion of variables that did not necessarily involve student interactions (e.g., student use of the library) makes this a true peer interaction model. This is noteworthy given researchers indicate that peer interactions are the single greatest source of student development (Astin, 1996; Newcomb, 1962).

Further significance is derived from the secondary research questions, which were designed to further the validity of the emergent taxonomy and involved examinations of student subgroups in relation to both demographic variables and a theoretically grounded measure of leadership. Kuh et al. (2000) suggested taxonomies incorporating student patterns of behavior may be more useful to policy and practice when linked to learning outcomes than the examination of student or institutional characteristics alone. Therefore, this study used leadership development as a means to

determine the degree to which subgroups of the taxonomy potentially differentiated between outcomes. This adds credibility to the emergent taxonomy and provides a foundation for future research that might incorporate the emergent latent patterns as a more accurate means of measuring student involvement in co-curricular group experiences. Results also offer unique insights into the role of patterns of involvement in group experiences in shaping the collegiate outcome of leadership. Previous research (Antonio, 2001; Astin, 1993b; Cress et al., 2001; Kezar & Moriarty, 2000; Smart et al., 2002; Zimmerman-Oster & Burkhardt, 1999) relied primarily on atheoretical measurements of leadership and definitional parameters inconsistent with current understandings of the phenomenon. This study provides a platform for more theoretically grounded research in this area. Finally, the study provides practitioners with unique insights into the relationships between and among group experiences as well as distinctive characteristics of members of various categories within the emergent taxonomy. This knowledge could prove useful in helping students navigate involvement experiences to select those patterns that demonstrate the most potential for enhancing the collegiate experience and overall learning.

Summary of Methods

This quantitative study employed a cross-sectional, causal comparative design using data from the Multi-Institutional Study of Leadership (MSL). The purpose of the MSL was to enhance knowledge regarding contemporary college student leadership development as well as the influence of higher education as a context in which building leadership capacity occurs (Dugan, Komives, & Associates, 2006).

The sample for this study is comprised of data from 50 institutions of higher education in the United States. Schools were selected using purposeful sampling techniques to best represent the vast diversity of institutional types in the U.S. higher education system. Participant samples were drawn according to study parameters from each of the participating schools. The total sample size for the MSL was 155,716 cases of which 56,854 submitted usable surveys. The resultant return rate of 37% exceeded the standard rate achieved in web-based survey research (Couper, 2000; Crawford, Couper, & Lamais, 2001). Data for this study were cleaned and reduced to include only those students that identified as seniors to ensure enough time within the collegiate environment to experience the wide array of involvement opportunities. The final sample for this study was comprised of 11,209 participants.

The MSL survey instrument consisted of new and pre-existing scales compiled specifically for use in the national study. The primary research question for this study relied upon 21 dichotomous variables used to determine participant involvement in co-curricular group experiences (e.g., academic groups, social fraternities and sororities, student governance, paraprofessional teams). Latent class analysis, a technique similar to cluster analysis, but more appropriate for use with dichotomous data representing unobservable or latent phenomena, was selected as the analytic technique (Dayton, 1998). Latent class analysis identifies subgroups, or categories, of mutually exclusive and exhaustive latent classes in multivariate, categorical data (McCutcheon, 1987). As an analytic technique, latent class analysis is well suited for exploratory studies given its ability to integrate analogues to both factor analysis and cluster analysis (Magidson & Vermunt, 2001, 2004). The analysis

results in a series of latent factors (i.e., underlying latent variables describing patterns of involvement) as well as latent classes (i.e., the student subgroups that emerge as a result of interactions between latent factors). Recruitment probabilities were used to classify study participants into each of the emergent classes (Dayton). The second research question relied upon an adapted version of the Socially Responsible Leadership Scale (SRLS) (Tyree, 1998) to determine the degree to which latent class differentiated between outcome scores. The final question relied on basic demographic data. Chi-square tests of independence were used to examine relationships between categories of the taxonomy and the demographic variables of race and gender.

Summary

This study builds upon previous literature in the areas of student involvement, peer interaction, and leadership development. Significant contributions can be made to the higher education knowledge-base by examining patterns of student involvement in co-curricular group experiences and relationships with a theoretically grounded measure of leadership development. Latent class analysis provides a means to classify students into subgroups representing underlying patterns of student involvement in group experiences. Results provide a unique contribution by creating a taxonomy useful in future research as well as practice. Results also offer insights given the emergent taxonomy avoids using a scattershot, macro-level, or micro-level approach to examining involvement in student group experiences, which have limited the generalizability and applicability of findings in past research. The next chapter provides a comprehensive review of literature relevant to this investigation and is

followed by a detailed outline of the research methods in the following chapter. The final two chapters present results from the study and a discussion of the findings.

CHAPTER 2: REVIEW OF THE LITERATURE

Understanding patterns of involvement across co-curricular group experiences and their relationship to student leadership development requires a review of literature on student involvement, peer interaction and socialization, and leadership development. These three distinctive, yet inter-related, spheres of the higher education and student affairs knowledge-base draw on a broad range of both theoretical and empirical research. As such, the review of literature is organized into three sections. The first section reviews theory and conceptual models related to the key areas of literature. The second section turns to empirical research providing a synthesis and critique. The final section provides a summary of the theoretical framework for this study as well as a broad critique of the extant literature.

Theoretical Influences

The review of literature begins with a synthesis of the evolving concept of student involvement in higher education. Attention is then given to the study of peer interactions and the student socialization process, concepts that further narrow the definition of involvement employed in this study. Finally, theoretical conceptualizations of leadership are explored.

Involvement

How students connect with and expend energy within the college environment continues to be a significant area of study in higher education (Astin, 1984; Kuh, 2001; Kuh et al., 2005; Pace, 1984). The concept of student involvement is particularly influenced by the works of Pace and Astin, who attempted to

parameterize what it means to be involved in the collegiate environment and differentiate between various types of involvement.

Quality of Effort

Early work on student involvement and the influence of the college environment on learning and development was conducted by Pace (1980, 1984) in the late 1970s using the College Student Experiences Questionnaire (CSEQ). He suggested that learning was a function of the amount of time and quality of effort that students invested in educational experiences. Pace (1984) further asserted that "the likelihood of having high-quality experiences depends on investing high-quality effort. By measuring effort, we may have the key to judging the quality of the educational process" (p. 5). The term quality of effort reflects the extent to which students engage with or use the educational opportunities available through the college and university, with frequency of use serving as a proxy for the amount of effort expended across increasingly complex behaviors (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003; Pace, 1980, 1984). However, Pace (1980, 1984) also limited his definition to only consider observable student behaviors; completely excluding student attitudes or psychological aspects of student involvement. This behavioral approach, although increasing the tangibility of student involvement and ease of measurement, does not account for the cognitive investment of effort students may make.

Theory of Student Involvement

Astin (1984) expanded on the work of Pace in his theory of student involvement, which included both psychological and behavioral dimensions. Astin

suggested that "student involvement refers to the quantity and quality of the physical and psychological energy that students invest in the college experience" (p. 528). This approach bridges both the psychological and sociological to examine not just student behaviors, but internal cognitive factors (e.g., motivation) as well (Astin; Pascarella & Terenzini, 2005). Astin's theory is comprised of five core postulates. First, the energy invested can be in objects with varying degrees of specificity (e.g., the broad student experience or a narrowly focused academic study group). Second, involvement falls along a continuum and the relative amount of involvement may shift from student to student and object to object. Third, involvement can be measured in terms of both qualitative and quantitative dimensions. Fourth, educational gains are a direct function of the amount and quality of involvement. Fifth, the relative value of any policy or practice in higher education directly relates to the degree to which it enhances involvement. Although Astin's work may not be a developmental theory in the true sense (Evans, Forney, & Guiddo-DiBrito, 1998; Pascarella & Terenzini), it offers a powerful tool from which to measure and understand students' college experiences as well as influences on educational outcomes. It also takes into consideration the varying ways in which students may invest energy as opposed to using behavior solely as a proxy for effort.

Both of the theories detailed above define the broad college environment as an opportunity for involvement, although Pace (1980, 1984) cautioned that not all educational experiences are of equal value. This is evident in the multitude of experiences classified as types of involvements, which range from simply using an institution's library to collaborating with a faculty member on a research project

(Astin, 1993b; Pace, 1980, 1984). The variance in the amount of effort and quality of experience in these two examples is significant, which points to the need for a body of literature and empirical research to supplement involvement theory and assist in narrowing the forms of involvement that most influence student learning. Pace (1980, 1984) and Astin (1984, 1991) began this process and from their own research cited involvement in student group experiences such as clubs and organizations as potentially powerful contributors to student educational gains.

Peer Interaction and Socialization

Theory on student involvement is complemented by literature on the topics of peer interaction and student socialization. The body of knowledge in this area provides an interpretative frame from which to derive meaning regarding the most influential components of the overall college environment. This section reviews the work of Newcomb (1962) and Weidman (1989) as a means to further narrow the field of involvement experiences as well as potentially provide a rationale for why co-curricular group experiences are cited as powerful influences on student learning.

Peer Interaction

Newcomb (1962) cited peer group interaction as one of the single most powerful influences over student attitudes and suggested that researchers need to have a clear understanding of the groups to which students belong to accurately assess the impact of the college environment. He defined peer groups as "any set of two or more students whose relationships to one another are such as to exert influence upon them as individuals" (p. 489). From this definition and ongoing research, he constructed a theory of peer interaction and its potential for influence on educational outcomes. The

theory is comprised of three factors contributing to peer group formation and four conditions in which the peer group has the potential to exert influence. Newcomb suggested that peer groups arise based on pre-college acquaintanceships, physical propinquity in the college environment, and/ or similarities of attitudes and interests. Of these three, he suggested peer groups based on similar attitudes and interests bear the potential for the strongest and most lasting influences. These influences, in turn, are dependent on the degree to which four key conditions are met. The first addressed the size of the group, with moderately sized groups demonstrating the most potential for influence given their ability to provide relationships of substantive depth as well as choice regarding whom students choose to interact with more intimately (Newcomb). Second, he suggested that groups with significant influence typically have a high degree of homogeneity (e.g., age, race, gender, social class, religious affiliation), which contributes to shared attitudes and solidarity between members. Although current literature suggests that individual interactions across difference often lead to positive educational outcomes (Hurtado et al., 1999; Kuh & Hu, 2003; Pascarella, Edison, Nora, Hagedorn, & Terenzini, 1996; Pascarella, Palmer, Moye, & Pierson, 2001; Whitt et al., 2001), Newcomb found that in terms of group influences, homogeneity led to stronger affiliation and congruence in values and attitudes within the group and among members. Third, peer groups with significant influence exist in relative isolation from other groups. Lack of communication with others increases the likelihood that norms will be shared internally, enforced as "right," and contribute to common attitudes and values (Newcomb). Fourth, the extent to which individuals

within the group reinforce group-supported attitudes shapes the level of influence by increasing perceived solidarity between members (Newcomb).

Undergraduate Socialization

Weidman's (1989) conceptual model for undergraduate socialization complements the peer interaction literature by illustrating the context and process by which students are influenced by the college environment. Undergraduate socialization is defined as "a process that results from the student's interaction with other members of the college community in groups or other settings characterized by varying degrees of normative pressure" (Weidman, p. 304). Normative pressure refers to the power or influence over values, attitudes, and personal goals exerted by reference groups to which the student belongs and in which the student has established close personal relationships (Weidman). These can include student group experiences, familial relationships, or groups to which the student is affiliated outside of the college environment (e.g., place of employment, church community, neighborhood association). The model draws on both psychological and sociological literature to outline the process by which students enter college, are exposed to socializing influences, assess and interpret socialization forces in the context of personal goals, and experience either change or consistency in those goals (Weidman). Weidman asserted that students heavily involved in co-curricular group experiences may be more likely than uninvolved students to form significant and meaningful referent group relationships with peers. This would suggest that co-curricular group experiences may wield a significant influence on the overall impact of college on students.

The literature on peer interaction and socialization is important in that it situates student reference groups as a powerful form of involvement. It reinforces the assertions of Pace (1980, 1984) and Astin (1984), which suggested that student group experiences may play a significant role in determining college impact. The above works point to the need to better understand who it is that students actually associate with in college and the degree to which this influences traditional college outcomes. It is particularly important in examining the outcome of leadership development, given contemporary conceptions situate it as a function of group processes and grounded in organizational contexts (HERI, 1996; Kezar et al., 2006; Komives et al., 2006; Northouse, 2006; Rost, 1991).

Leadership Development

The literature on leadership development is complex and draws from a variety of disciplines including political science, education, public policy, business and management, and philosophy among others (Brungardt, Gould, Moore, & Potts, 1997; Drath, 1998; Rost, 1991). Therefore, understanding the influence of student involvement in co-curricular group experiences on leadership development requires not just an understanding of collegiate leadership, but the evolution of leadership theory as well. This section will outline the historical emergence of two distinct paradigms in the leadership literature, the industrial and the post-industrial, as well as highlight several theories from each.

Industrial Paradigm

The industrial paradigm, also referred to as the conventional paradigm, traces leadership from its earliest conceptualizations to today (Northouse, 2006; Rogers,

2003; Rost, 1993). The overarching assumptions of this paradigm situate leadership as residing in the individual, place importance on power and control, and intermingle the terms leadership and management (Rogers; Rost). Leadership is believed to be a function of the individual and not group process. This places emphasis on competition, analytic and rational thinking, and individual needs rather than group goals. In accordance with this paradigm, leadership is also about power and influence grounded in positional authority (Rogers). There is no distinction between the terms leader and leadership, which contributes to a belief that the leader holds all necessary knowledge, power, and the ability to direct action. There is also little distinction between the terms leadership and management, which situates leadership as merely being a product of good management (Northouse; Rost). Major theories associated with this paradigm include trait, behavioral, and situational leadership.

Trait theories. Trait theories began to emerge in the early 1900s and posit that leadership is really about inherent characteristics that individuals are either born with or lack (Bass, 1990; Komives et al., 2007; Northouse, 2006). This notion was consistent with previous generations of theories (e.g., great man theories) that suggested leaders were born rather than made, but expanded who this influenced beyond lineage (i.e., royalty, wealthy families). Much of the research on leadership during this time (e.g., Caldwell & Wellman, 1926; Dunkerley, 1940; Hunter & Jordan, 1939; Page, 1935; Reynolds, 1944; Terman, 1904; Zeleny, 1939) attempted to identify the key traits that were inherent in successful leaders and pointed to the following: intelligence, self-confidence, determination, integrity, and sociability (Bass; Northouse). However, it is also important to note that the social construction of

race and gender at the time of these studies clearly dictated who was studied and who was not. Based on this, one could add the following assumed traits to the list as well: male, White, upper-class, heterosexual, and able-bodied.

Behavioral theories. Trait theories began to give way to behavioral theories emerging from the field of psychology in the mid 1900s (Komives et al., 2007; Northouse, 2006). These theories suggest that leadership is less about inherent characteristics and more about a specific set of human behaviors that reflect successful leadership (Komives et al.; Northouse). Experiments conducted at The Ohio State University (Hemphill & Coons, 1957) and the University of Michigan (Cartwright & Zander, 1960; Katz & Kahn, 1951) contributed significantly to the development of behavioral theories of leadership. These influential studies examined task and relationship-related behaviors and found that individuals that exhibited high functioning behaviors across both were most successful in leadership, thus establishing the belief that there was one best way to lead (Komives et al.; Northouse).

Situational theories. Behavioral theories of leadership began to give way in the late 1900s to situational/ contingency theories in large part due to their oversimplification of the complex phenomenon that is leadership (Komives et al., 2007). Absent from behavioral theories was the role of the environment in shaping the success of leaders. Individuals might enact a set of behaviors in one environment with positive results, but experience negative results when enacting the exact same behaviors in another environment. Situational theories highlight the environment as the greatest influence on leadership effectiveness and suggest that different situations

require different sets of behaviors and types of leadership (Blanchard, Zigarmi, & Nelson, 1993; Hersey & Blanchard, 1969). Most situational theories are grounded on the leader's ability to quickly and accurately asses the needs of a group or situation based on two dimensions of behaviors: level of support and level of directiveness (Northouse, 2006).

Post-Industrial Paradigm

The post-industrial paradigm, also referred to as the emergent or alternative paradigm, reflects leadership theories rising out of the latter part of the twentieth century and start of the twenty-first century (Komives et al., 2007; Rogers, 2003; Rost, 1991). These theories completely reconceived both the purpose and nature of leadership reconstructing it as a shared process focused on change and grounded in relationships (Rogers; Rost; Wheatley, 2006). Leadership becomes less about individuals and more about collective action towards common goals. These goals often are targeted at creating social change, which becomes possible through the blurring of positional boundaries and enhancing the quality of relationships within groups. The post-industrial paradigm places strong value on collaborative processes, transformational experiences, relational ways of working together, and non-positional approaches (Rogers). Major theories associated with the post-industrial paradigm include reciprocal and authentic leadership.

Reciprocal theories. Reciprocal leadership theories emerged in the late 1970s in large part due to the paradigmatic shift in how leadership was conceptualized (Kezar et al., 2006; Komives et al., 2007). As researchers and theorists began to understand leadership as more of a relational process characterized by shared goals,

new paths to understanding how this was achieved in practice began to arise (Komives et al.). Reciprocal theories elevated the important role that followers play in the leadership process and shifted attention away from leader-centric models (Kezar et al; Komives et al.). Two of these theories, transformational leadership (Burns, 1978) and servant leadership (Greenleaf, 1977), are particularly strong examples of both the emerging paradigm and reciprocal theories. Transformational leadership directly links the roles of leaders and followers in the process of leadership while highlighting the importance of values, ethics, and long-term goals (Burns). The theory also focuses on the transformational role that leadership plays both in terms of individuals' lives and broader society (Burns). Greenleaf's servant leadership also fits within the reciprocal leadership family of theories and is guided by the premise that individuals first should seek to serve others. Serving others eventually changes to leading others as a means of expanding the scope of service (Greenleaf). The theory supports those in both positional and non-positional roles and emphasizes values such as collaboration, trust, ethical practice, empowerment, and listening (Greenleaf).

Authentic leadership. Recently, theorists have attempted to increase the complexity with which leadership is viewed through a multi-dimensional approach grounded in the emerging field of positive psychology (Avolio & Gardner, 2005). Authentic leadership is described as a root construct that is additive in nature (e.g., one could practice authentic servant leadership), but also independent of other theoretical constructions due to its developmental components (Avolio & Gardner). Authentic leadership is essentially a process of both the leader and associate (i.e., follower) engaging in mutual development focused on increasing self-awareness and

self-regulated positive behaviors in the context of complex organizational environments (Avolio & Gardner). Although significant research on this concept has yet to emerge, theorists have spent substantial time further refining and applying the theory in a variety of contexts.

College Student Models

The study of leadership development among college students is a relatively recent phenomenon (Astin, 1993b) despite the fact that in the last 100 years approximately 65% of all published research on leadership relied upon college students as the primary sample (Avolio et al., 2005). In the 1990s, however, researchers and theorists began to turn their attention to the development of leadership competence during college in more direct ways, resulting in the creation of a number of models of leadership development designed specifically for college students. These include the leadership challenge measured using the Student Leadership Practices Inventory (Posner, 2004; Posner & Brodsky, 1992), the social change model of leadership development (HERI, 1996), the relational leadership model (Komives et al., 1998), and the leadership identity development model (Komives et al., 2006). All of the above models are consistent with the values associated with the post-industrial leadership paradigm and can be applied in a variety of ways to practice. However, the social change model of leadership development (HERI) will be discussed here in greater detail due to its identification as one of the most widely-used student leadership models (Kezar et al., 2006; Moriarty & Kezar, 2000).

The social change model (HERI, 1996) was designed specifically for the college student population and is grounded in two core principles. First, leadership is believed to be inherently tied to social responsibility and manifested in creating change for the common good (HERI). Second, the model is predicated on increasing individuals' levels of self-knowledge and capacity to work collaboratively with others (HERI). The above is accomplished by assisting students in growth across seven critical values (i.e., consciousness of self, congruence, commitment, collaboration, common purpose, controversy with civility, and citizenship), which in turn contribute to an eighth value of change for the common good (HERI). These values interact dynamically across three levels: individual (i.e., consciousness of self, congruence, and commitment), group (i.e., collaboration, common purpose, and controversy with civility), and society (i.e., citizenship). It is a continual process of learning and self-evaluation grounded in developmental progress which creates an uneasy tension amongst the levels. For example, as students experience group level values who they are as an individual may inherently change causing the need to revisit previously understood values using the newly adopted developmental frames. The social change model defines leadership as a purposeful, collaborative, values-based process that results in positive social change (Dugan & Komives, 2007; HERI).

Summary of Theory

The theoretical model employed in this study draws from three distinct areas of literature: student involvement, peer interaction and socialization, and leadership development. Theoretical interpretations of how the college environment influences student educational gains provided the foundation drawing heavily from Astin (1984)

and Pace (1980, 1984). Theories detailing the specific influences of peer interactions (Newcomb, 1962) and student socialization (Weidman, 1989) provided a framework from which to build off of the student involvement foundation. This framework served as a rationale to look specifically at co-curricular group experiences as an intervention point in effecting educational outcomes. Finally, the theoretical construction of leadership positioned it well for exploration as an educational outcome associated with co-curricular group involvement experiences. The social change model of leadership development (HERI, 1996) was particularly appropriate given its focus on group values, interdependent relationships, and process-orientations.

Review of Extant Research

Researchers have demonstrated that what a student does in college, rather than who that individual is or the type of institution attended, is the strongest predictor of educational gains such as leadership (Kuh et al., 2005; Pascarella & Terenzini, 2005). It is not surprising, then, that college impact research writ large has documented the influence of student involvement on a wide range of educational outcomes including: cognitive development (Gellin, 2003; Inman & Pascarella, 1998; Whitt et al., 1999), psychosocial development (Cooper et al., 1994; Foubert & Grainger, 2006), identity development (Harper & Quaye, 2007; Hurtado et al., 1999; McClure, 2006), career-related skills (Astin, 1993b; Whitt et al.), and educational attainment/ persistence (Beil et al., 1999; Berger & Milem, 1999; Leppel, 2002; Titus, 2004), among others. However, the influence of involvement on theoretically-derived measures of leadership, a key college outcome (Astin & Astin, 2000; King, 1997; Zimmerman-

Oster & Burkhardt, 1999), remains relatively understudied (Dugan, 2006a, 2006b). Furthermore, the study of student group experiences, identified in the theoretical literature as among the most potent types of involvement (Astin, 1984; Newcomb, 1962; Pace, 1984; Weidman, 1989), suffers from limitations in measurement. Much of the research was conducted either at the macro-level (i.e., examining involvement in student clubs and organizations in general), the micro-level (i.e., examining involvement in highly specific student groups or organizations), or using a scattershot approach (i.e., a random set of group experiences), all of which limit the transferability and/ or applicability of results across institutions. This section provides an overview of the existing research beginning with an examination of taxonomies of college students, which typically create categories of student subpopulations based on patterns of engagement within the college environment. This is followed by a discussion of research and findings organized by definitional parameter used for involvement (e.g., macro-level, micro-level, or scattershot approach) when explored in relation to student leadership development.

Taxonomies

Taxonomies of college students are examined as a means to understand how involvement and peer interactions work together to create student subcultures. Student taxonomies offer a bridge to better understand how involvement influences student educational gains (Kuh et al., 2000). Similarly, if how students socialize is important, then understanding student subcultures in the context of involvement is important as well (Kuh, 1995). Over the past 40 years, numerous researchers have attempted to classify students by a variety of characteristics (Astin, 1993a; Clark &

Trow, 1966; Holland, 1966; Kuh et al., 2000; Newcomb, Koenig, Flacks, & Warwick, 1967; Tabor & Hackman, 1976). This section will focus on the strengths and limitations of three of the most cited typologies: Clark and Trow (1966), Astin (1993a), and Kuh et al. (2000).

Clark and Trow (1966) proposed one of the earliest and most cited conceptual models of student subcultures (Kuh et al., 2000). The researchers' work is predicated on the belief that environments exert a coercive influence over the behavior of those within them (Clark & Trow). Therefore, students in their taxonomy were classified into groups based on two underlying dimensions that contributed to a primary orientation or subculture: students' degree of identification with the school and their involvement with intellectual ideas (Clark & Trow). These concepts reflect the degree of influence the environment exerts on student behaviors. The resulting taxonomy identified four subcultures: academic, nonconformist, collegiate, and vocational (Clark & Trow). Both academic and non-conformist orientations are characterized by high engagement with intellectual ideas through traditional modes (e.g., faculty interactions, curriculum, research projects), although non-conformists traditionally do not possess a strong affiliation to the institution and seek engagement outside the campus community (Clark & Trow). Collegiate and vocational subcultures are characterized by less involvement with intellectual ideas through traditional modes and intellectual stimulation sought through more social or experiential avenues (Clark & Trow). The vocational subculture, like the non-conformist, is characterized by less attachment to the institution.

Research on the Clark and Trow (1966) taxonomy is extensive with numerous studies confirming the construct validity as well as student differentiation between the four categories based on personality factors, behaviors, and attitudes and values (Apostal, 1968; Kees & McDougall, 1971; Lange, 1972; Lange, Woodburn, & Miller, 1974; Terenzini & Pascarella, 1977). Pertinent to this research, one study identified students within the collegiate subculture as significantly more involved in student activities such as clubs and organizations than students from each of the other categories (Maw, 1971). However, despite its popularity, the work of Clark and Trow suffers from a number of limitations. First, the initial conceptual model was created in the late 1950s based on students at a single institution and with a sample that is not consistent demographically (e.g., race, gender, socio-economic status) with the current college population on campuses today. This draws into question the generalizability of the model in today's higher education context given the lack of validity studies since the 1970s. Furthermore, the model and subsequent research on it do not identify the extent to which students' interactions across categories are mutually exclusive nor the degree to which values are shared within each category and how they differ from values held by college students in general (Terenzini & Pascarella).

Astin's (1993a) typology builds upon the work of Clark and Trow (1966) with findings paralleling those in previous studies attempting to identify taxonomies of college students. It also benefits from the use of longitudinal, multi-institutional data collected via the Cooperative Institutional Research Program (CIRP) between 1971 and 1980 (Astin). The model was initially created using a CIRP sub-sample of 2,595

students that had completed all 60 items used to create the classification (Astin). The emergent taxonomy was then tested for construct validity using more than 20,000 cases from the full sample as well as more than 15,000 cases from another CIRP longitudinal sample collected between 1985 and 1989 (Astin). The research builds on previous taxonomies by adding dimensions upon which students are classified into groups (i.e., values, self-concept, educational expectations, social attitudes, and expected behaviors) (Astin). The study resulted in seven categories: scholar (i.e., students with high academic self-esteem and expectations for academic success), social activist (i.e., students focused deeply on serving the greater community and committed to social change), artist (i.e., students that highly value artistic ability and creativity), hedonist (i.e., students that value and report high rates of alcohol and cigarette use, believe in legalization of marijuana, and report staying up all night), leader (i.e., students that report high degrees of popularity, social self-confidence, communication skills, and leadership skills), status striver (i.e., students committed to achieving personal and financial success and professional recognition), and uncommitted (i.e., students with a tenuous level of connection to the institution and high degrees of uncertainty about the college experience) (Astin). Of particular interest to this study is the category of leader. Students in this group were significantly more likely to report an expectation to be elected into positional leadership roles in college (Astin).

Although Astin's (1993a) taxonomy received considerably attention for the ways in which it built upon existing models, the findings are limited in a number of substantial ways. First, in validation studies using CIRP data, only 39% of students

were able to be classified by the model (Astin). That means almost two-thirds of students did not fit into any of the categories listed. This could be due to the limited number of items used to create the distinct groups. Each category of the taxonomy was established using between only four and six total items, significantly limiting the descriptive power of the results (Astin). Second, and perhaps most problematic, is the inference of behavior instead of the actual measurement of it. In other words, students are classified based on their expected behaviors during college versus actual reported behaviors, which could potentially change once the student is immersed in the environment. Third, the study relied upon definitional parameters to identify the category of leader that reflect more industrial constructions of the phenomena that are no longer consistent with most institutions' educational missions as they relate to leadership (Roberts, 2003). The category of social activist seems much more readily aligned with post-industrial models of leadership.

Kuh et al. (2000) attempted to build upon existing taxonomies using longitudinal, multi-institutional data from the CSEQ collected between 1990 and 1997. The sample was comprised of 51,155 students from 128 colleges and universities (Kuh et al.). The study relied on a total of 126 items that comprised eight components, or factors, used to classify students across the important behavioral dimension omitted in prior research (Kuh et al.). The components, or domains of engagement, reflected the following areas: academics, co-curricular involvement, social peer interactions, substantive peer interactions, scientific activities, cultural/ performing arts, faculty interactions, and sports and exercise (Kuh et al.). The researchers identified 10 categories of peer groups: disengaged (i.e., both low

academic and social effort as well as low levels of involvement and academic achievement), recreator (i.e., high effort in sports and exercise, but relatively low effort in all other areas), socializer (i.e., above average amounts of social peer interactions, but little involvement in other areas), collegiate (i.e., high involvement in co-curricular activities leading to increased faculty and peer interaction), scientist (i.e., emphasis on science, math, and quantitative research activities), individualist (i.e., substantive peer interactions around topics of art music, and theater, but little faculty interaction), artist (i.e., high value for artistic endeavors coupled with significant faculty interaction), grind (i.e., high academic effort, but little effort in any other domain), intellectual (i.e., above average effort levels across all domains), and conventional (i.e., mixed pattern of involvement typically characteristic of first-year students) (Kuh et al.). They also found that these peer groups were not predicated on institutional characteristics nor did composition across categories differ significantly by key demographic characteristics (Kuh et al.).

The major limitation of Kuh et al.'s (2000) research lies in its approach to measuring student behaviors. Although the goal is to categorize students into peer reference groups characterized by greater inter-group interaction, many of the survey items are not necessarily indicators of peer-to-peer interaction. For example, writing and revising a rough draft of a paper and finding material by browsing through the library are not necessarily group processes and likely occur in isolation. Thus, the taxonomy really consists of a variety of broadly defined involvement experiences and not necessarily just those characterized by high degrees of peer interaction, the source of greatest influence on student educational outcomes (Newcomb, 1962).

The taxonomies of college students represented above highlight an evolving attempt to distinguish between student subcultures based on characteristics related to their degree and type of engagement in the college environment. Understanding student subcultures provides an excellent intervention point for learning (Astin 1993a; Kuh et al., 2000; Renn & Arnold, 2003). It is also interesting to note the overlap in classification of categories across taxonomies (See Table 1), which some suggest is evidence of the stability of student peer/ reference groups over time and context (Astin; Kuh et al.). This is particularly apparent looking at the categories corresponding to Clark and Trow's (1966) collegiate that appear across taxonomies. In the Kuh et al. (2000) study, groups similar to the collegiate comprised nearly a third of the overall sample. These groups are regularly identified as highly involved in co-curricular group experiences, yet the measurement of this in taxonomies is only conducted at the macro-level (i.e., general membership in clubs and organizations) (Astin; Clark & Trow; Kuh et al.; Maw, 1971). This is inconsistent with theoretical claims that not all educational interventions are equal (Pace, 1984). A taxonomy of patterns of student involvement across co-curricular involvement experiences, then, could provide a needed supplement to understanding student subcultures, particularly those related to the collegiate classification.

Table 1

Overlap in Categories of Most Cited College Student Taxonomies

Clark & Trow 1966	Astin 1993a	Kuh et al. 2000
Academic	Scholar	Intellectual Scientist Grind
Collegiate	Social Activist Leader	Collegiate Socializer Conventional
Vocational	Status Striver	
Non-Conformist	Unconnected Hedonist Artist	Disengaged Recreator Artist Individualist

Macro-Level Research Approaches

Foundational research on college student leadership largely defined involvement variables using a macro-level approach that lumped any type of co-curricular group experience into a single indicator labeled involvement in student clubs and organizations. The work was also generated almost exclusively from CIRP longitudinal data, limiting both the variables used in the research as well as the definitional approach to leadership. Despite these limitations, four key studies established a body of literature in this area and are examined in detail in the following section. This is followed by a synthesis of additional studies on the influence of involvement in group experiences on college student leadership development that have taken a macro-level approach in measurement.

Foundational Research

Some of the earliest research conducted on college student leadership is associated with Astin's (1993a) typology of college students presented in the previous

section. Approximately 4,000 cases from the CIRP, a multi-institutional, longitudinal data set from 1984 to 1989, were used to identify a type of student labeled as leader. In this case, leader referred to students with high scores on measures relating to self-reported leadership ability, popularity, social self-confidence, and election to positional leadership roles. Increases in students classified as leaders were attributed in large part to high degrees of peer interaction as well as a variety of college experiences (Astin, 1993a). Astin (1993b) also examined increases in leadership abilities as an outcome variable, with election to a positional leadership role in a student club or organization identified as one of the strongest, positive effects. Additionally, the number of hours students participated in co-curricular student group experiences such as clubs and organizations was among the top environmental variables with a positive residual correlation with self-reported growth in leadership abilities (Astin, 1993b).

Astin's (1993b) early research on college student leadership clearly linked peer interactions through co-curricular group experiences with gains in leadership ability. However, the research itself suffers from definitional parameters inconsistent with current understandings of leadership. Variables used to classify students as leaders were tied to behaviors associated with more-leader centric models (e.g., leadership as attainment of positional leadership roles). Furthermore, no clear definition was provided for the term leadership when measuring it as a self-reported outcome variable, leaving students to respond from whatever developmental status with which they interpreted the term. For example, some students may self-report high leadership abilities, but define leadership as management or power and control.

Finally, the research relied more heavily on election to positional leadership roles as a measure of co-curricular involvement than general membership in clubs and organizations, further perpetuating a hierarchical and power-structured approach to leadership.

Another research study using CIRP data, this time from 1986 to 1990, examined college student leadership using a path-analytic technique (Smart et al., 2002). The sample consisted of 2,410 students from a single institution. The researchers were particularly interested in the influence of institutional expenditures on students' leadership development, but included the influence of co-curricular group experiences in their hypothesized model. The influence of these experiences was embedded in a composite variable for student activities that included number of hours spent each week participating in clubs and organizations, socializing with friends, and whether the participant had been elected to a positional leadership role (Smart et al.). Leadership was measured by a composite variable comprised of the students' self-perception of leadership ability, drive to achieve, popularity, and intellectual and social self-confidence (Smart et al.). After controlling for other variables, results indicated that the degree of engagement with involvement activities had positive direct and total effects on the measure of leadership ability (Smart et al). Participation in involvement activities also emerged as a mediating variable for significant indirect effects for other variables in the model (Smart et al.).

Given this research relied on CIRP data; it suffers from similar definitional limitations as Astin's (1993b) study. The researchers attempted to address this by adding additional items (i.e., intellectual self-confidence and drive to achieve) to the

composite variable for leadership ability. However, these additions did not sufficiently alter the measure in terms of consistency with current theoretical interpretations. The researchers' decision to include frequency of social interactions in the measure of student involvement activity, while consistent with research on peer influence (Astin; Newcomb, 1962), diluted the ability to draw inferences about the relative contribution of co-curricular group experiences to the overall results. However, in the context of Astin's previous research, one could assume that group experiences continue to contribute within the overall model. A final limitation of this study was its use of only a single site and the extent to which this hampers the generalizability of results to other college environments.

Kezar and Moriarty (2000) explored differences in self-perception of leadership ability and leadership-related traits across gender among African American and White students. The study was comprised of 9,731 participants from 352 schools collected as part of the CIRP 1987 to 1991 longitudinal data set (Kezar & Moriarty). The measure for self-reported leadership ability was not clearly indicated, but appeared to be the same, single-item measure used in composite scales from previous CIRP studies. Leadership-related scales were also not clearly explained, but appeared to be single-item measures for each of the following: public speaking ability, writing skills, ability to influence others, and social and intellectual self-confidence (Kezar & Moriarty). Step-wise regression was used to explore predictors for each of the outcomes based on the four populations of study: African American men, African American women, White men, and White women. The researchers included a wide-array of curricular and co-curricular involvement variables including active

participation in student clubs and organizations and election to a positional leadership role in a student club or organization. This reflects the use of both a macro-level and scattershot approach to defining involvement. Results suggested that election to a positional role was a significant and potent predictor of leadership ability for African American women and White men, but did not predict leadership ability for the other groups (Kezar & Moriarty). Active membership in a student group was a significant predictor only for White students (Kezar & Moriarty). Of the leadership-related measures, active participation in a group was a predictor of public speaking skills for White men and women, of ability to influence for White women, and social self-confidence for White men (Kezar & Moriarty). Election to a positional role only entered the regressions as a predictor of public speaking skills for White Men (Kezar & Moriarty).

The above study is an important philosophical contribution to the literature given its compelling argument that leadership as traditionally defined may not be equally accessible to all populations and that leadership development may be differentially influenced based on conditional effects. The study is also one of the first to examine a wide-array of predictors including broad institutional considerations. However, it failed to adequately differentiate how its measures of leadership are any different than those reflecting more traditional leadership models. The researchers likely attempted to compensate for this by including "leadership-related traits," although some might argue that their choices may not accurately capture this. Most of these limitations are a function of using an existing data set.

One of the first attempts to link leadership training with leadership ability and leadership-related outcomes was conducted using longitudinal CIRP data from 1994-1998 and supplemental surveys (Cress et al., 2001). The study relied on 875 participants from 10 institutions that identified as participating in formal leadership activities, and this data was compared with peers at the same institutions who had not participated in leadership activities (Cress et al.). These activities included election to a positional leadership role in a student club or organization as well as involvement in formal leadership training experiences, alternative spring break, tutoring and mentoring programs, and volunteer or service activities (Cress et al.). Thus, this study also integrated macro-level and scattershot approaches to measurement of involvement. Supplemental questions were included to enhance the definitional framework for leadership outcomes, which clustered into three composite variables labeled: leadership understanding and commitment, leadership skills, and personal and societal values. These composite outcomes were complemented by two leadership-related outcomes labeled multicultural awareness and civic responsibility. Results of the study indicated that participants in formal leadership activities scored significantly higher and demonstrated statistically larger gains than non-participants across all leadership measures (Cress et al.). Given the significant amount of controls employed in this study, the researchers suggested that outcomes are influenced not by individual characteristics or self-selection into programs, but by participation in leadership activities (Cress et al.).

Although, this design is not technically a macro-level approach to measuring co-curricular group experiences, the large number of experiences that fall within this

framework make it appropriate for inclusion in this section of the literature review. In comparison with the Smart et al. (2002) study, this research at least created a composite variable for leadership activities that did not inter-mingle less formal group experiences (e.g., socializing with friends). The study also benefited from a definitional framework for leadership that was more congruent with current understandings of the phenomena, though it still lacked theoretical grounding. It is also important to note that the study was not able to examine the quality of effort exerted in leadership activities, a variable identified as critical by Pace (1984). The study was limited to a comparative analysis of participants and non-participants, but did provide foundational evidence integral for future research.

Additional Macro-Level Studies

A number of additional research studies take a macro-level approach to defining student involvement and are useful in understanding the influence of co-curricular group experiences on leadership development. Theses studies, however, are either limited by their methodological design or did not include involvement as the key variable of interest. Nevertheless, the results provide useful insights into the topic area and are reviewed in the sections that follow.

A descriptive, single institution study was among the first published research to empirically test the social change model of leadership development (HERI, 1996) in its examination of the influence of four types of involvement, including membership in college organizations and positional leadership roles, on students' self-reported leadership development (Dugan, 2006b). This also reflected a mixed approach to measuring involvement that included both macro-level and scattershot

approaches. The study was comprised of 859 participants and used multivariate analysis of variance to examine mean differences across measures for the eight values associated with the model (i.e., consciousness of self, congruence, commitment, collaboration, common purpose, controversy with civility, citizenship and change). The study compared involved and uninvolved students, but did not account for quality of effort in each type of involvement. Students involved in positional leadership roles reported significantly higher mean scores than uninvolved peers across measures of commitment, collaboration, common purpose, and citizenship (Dugan). Students active as general members in student organizations reported significant differences with uninvolved peers across only common purpose and citizenship (Dugan). The study clearly demonstrated that group-level experiences have an impact on group-level outcomes. However, since the study was not longitudinal and controls were not in place to examine the effect of this type of involvement above and beyond other forms of involvement or pre-college characteristics, the generalizability of findings is limited.

Another single-site, qualitative study examined college student leadership development using a theoretical grounding; this time using the relational leadership model conceptualized by Komives et al. (1998). In a grounded theory of leadership identity development (LID) among highly involved students, researchers identified a 6-stage process through which individuals develop a leadership identity consistent with relational values associated with the post-industrial paradigm (Komives, Owen, Longerbeam, Mainella, & Osteen, 2005). Findings identified peer influences and meaningful involvement among the developmental influences across each stage of the

theory and its resulting model (Komives et al., 2005; Komives et al., 2006). Participants in the research associated older peers in student clubs and organizations as key reasons they chose to become involved (Komives et al., 2005; Komives et al., 2006). The actual group experiences then contributed in meaningful ways to the clarification of personal values, development of new skills, more complex ways of engaging with others, and ultimately the development of a relational leadership identity (Komives et al., 2005; Komives et al., 2006). The research provides a clear link between involvement in co-curricular group experiences and leadership development and benefits from a theoretical grounding in the college student leadership literature, a design choice typically missing in existing research. However, participants selected for the study all reported heavy involvement in student clubs and organizations calling into question the degree of transferability of findings to students who are less involved or uninvolved. Degree of transferability may also be limited given participants reflect only a single institution. Further testing of the theory and model is necessary to determine the extent to which it holds across populations.

In comparison with the Komives et al. (2005) research, another qualitative, single site study examined perceptions of leadership between students involved in positional leadership roles in co-curricular group experiences and those that identified as uninvolved (Shertzer & Schuh, 2004). The researchers found that students in positional roles demonstrated values associated almost exclusively with more industrial conceptualizations of leadership (e.g., positionality, individualism, control, trait-based approaches), but also felt more empowered to pursue leadership opportunities (Shertzer & Schuh). Uninvolved students shared a mixture of values

associated with both the industrial and post-industrial paradigms, but demonstrated powerful constraining beliefs (e.g., availability of opportunities, self-efficacy for leadership, general motivation) that limited their experiences (Shertzer & Schuh). The comparison between populations is helpful in understanding the influence of co-curricular group experiences especially when taken in context with the leadership identity development findings. One might assume that the more industrial perspectives regarding leadership are related to the student's stage of relational leadership identity. Similarly, the data from uninvolved students seems to reflect various stages of LID as well, indicating it may hold across both involved and uninvolved groups.

Findings from this study also point to the powerful role involvement in positional leadership roles plays in helping students to develop empowering beliefs in their leadership ability and reduce the influences of constraining beliefs, thus contributing to students' overall degree of self-efficacy for leadership. This suggests a potential indirect relationship between student involvement in co-curricular group experiences and leadership development outcomes. However, findings from this study are limited in a number of ways methodologically. First, the definitions used to differentiate between the two samples in the study reflect a more industrial dichotomy, making the presence of industrial leadership values unsurprising. Second, only limited descriptive information is shared regarding the sample, making it difficult to interpret findings. Finally, the methodology employed in this qualitative research lacks specificity and seems to involve simple interviewing rather than more rigorous methodologies such as case study or grounded theory.

Micro-Level Research Approaches

Although much of the foundational research on the influence of involvement in co-curricular group experiences on student leadership development has taken a macro-level approach in measurement, many studies have examined the specific influences of particular types of group experiences (e.g., student government, fraternity and sorority membership, formal community service) on leadership or the leadership characteristics of students in these groups. Evidence of influence can also be gleaned from scattershot approaches to measurement that reported unique differences between variables in the set of group experiences designed to measure involvement. This section examines research as it relates to particular co-curricular group involvement experiences.

Fraternities and Sororities

Social fraternities and sororities have a long history in American higher education and were developed as a means to create community and a sense of affiliation while promoting leadership, community service, and scholarship (Owen, 1991). A substantial amount of research examines the relationship between membership in social fraternities and sororities and leadership development. Early research was conducted using CIRP data by Astin (1993b) and found that the greatest gains in leadership skills were associated with high degrees of peer interaction, particularly in experiences such as social fraternities and sororities. Also using CIRP data, Kezar and Moriarty (2000) found membership in a social sorority to be a significant predictor of leadership ability for White women. It did not emerge as a predictor for African American women nor did fraternity membership demonstrate

significance for either White or African American men (Kezar & Moriarty). Antonio (2001) used CIRP data to examine the influence of the college environment, and specifically cross-racial interaction, on leadership development by splitting the sample to compare students reporting significant cross-racial friendships with those that reported more racially homogenous friendship groups. Membership in social fraternities and sororities emerged as a significant predictor of leadership development in hierarchical regressions for students with racially homogenous friendships, but not for those with racially heterogeneous friendships (Antonio). The work of the above research suffers from the same limitations associated with other CIRP studies, particularly around how leadership was defined and measured.

A single-campus study using an instrument designed to examine students' perceptions towards leadership based on a hierarchical or systemic orientation collapsed social fraternities and sororities in with political organizations and found no significant differences in student orientations (Thompson, 2006). That is, students involved in these groups were just as likely to identify a hierarchical orientation as a systemic orientation (Thompson). In another single-site, correlational study examining perceptions of leadership among members of social fraternities and sororities, the researchers defined three forms of leadership (i.e., social influence, transformational, and positional) and examined them using predictors related to key personality traits (e.g., extraversion, agreeability, dominance, hope for power) (Harms, Woods, Roberts, Bureau, & Green, 2006). Predictors of positional role attainment were associated with more industrial paradigm values of hope for power and dominance, while both social influence and transformational leadership were

related to more post-industrial values such as agreeableness and conscientiousness (Harms et al.). When both of the above studies are taken in the context of leadership identity development, one might infer that participants in these organizations simply run the gamut in the complexity of their thinking about leadership.

A significant amount of research on social fraternities and sororities is also grounded in the leadership model posited by Kouzes and Posner (1987, 2003), which suggests that there are five behaviors that individuals practice at times when they achieve their personal best as leaders. These include: challenging the process, inspiring a shared vision, enabling others to act, modeling the way, and encouraging the heart (Kouzes & Posner, 1987, 2003). This model was later adapted for college students along with an assessment instrument designed to measure each of the behaviors (Kouzes & Posner, 1998). Researchers have consistently found that perceptions of leader effectiveness within social fraternities and sororities is a function of the extent to which the individual exhibits the behaviors associated with the model and that there are not significant differences based on membership in fraternities versus sororities (Adams & Keim, 2002; Posner, 2004; Posner & Brodsky, 1992, 1994). However, what this line of research does not address is the extent to which the behaviors are a function of participation in social fraternities and sororities or some other variable. It could be that the group experience has little to do with the development of these skills and the relationship is more correlational than causal.

Cultural Fraternities and Sororities

Cultural fraternities and sororities differ from predominately White Greek-letter organizations across a number of key dimensions including a focus on

community service and cultural heritage (Kimbrough, 1995; McKenzie, 1990; Sutton & Terrell, 1997). Although not a recent phenomena, these organizations are relatively understudied as a source for student development having traditionally been examined in the aggregate with traditionally White fraternities and sororities (Sutton & Kimbrough, 2001). More recent research examines the unique contributions of these organizations to student leadership development. Kimbrough conducted a single-site study with 61 involved African American students, a portion of which (n = 27) identified as members of Black Greek-letter organizations. Both members of Black Greek-letter organizations and African American students involved in other cultural organizations self-reported high degrees of leadership skills (Kimbrough). Two-thirds of those involved in Black Greek-letter organizations also reported that membership had a direct and positive influence on their leadership aptitude (Kimbrough). These findings were mirrored in another small-scale study (n = 80) of African American men involved in Black Greek-letter organizations at two campuses, which found that 36% of participants associated leadership skill development with their experiences in the cultural fraternity (Sutton & Terrell). Participants in this study also identified involvement in a Black Greek-letter organization as contributing significantly to their self-efficacy for leadership (Sutton & Terrell). Another study examining trends in Black student involvement generated a larger sample of 405 participants from nine different campuses of which 47% reported membership in Black Greek-letter organizations (Kimbrough & Hutcheson, 1998; Sutton & Kimbrough). The researchers essentially validated previous findings relating to the relationship between Black Greek-letter organization membership and high levels of self-reported

leadership skills and self-confidence as well as the perceived positive influence of membership on leadership development (Kimbrough & Hutcheson; Sutton & Kimbrough). The studies above are limited by both sample size and the degree of sophistication of the analytical approach (e.g., cross-sectional design, absence of control variables and pretests, simplistic statistical tests employed) (Pascarella & Terenzini, 2005). Additionally, no empirical research was found examining the influences of membership in cultural fraternities and sororities targeting other populations (e.g., Native Americans, Latinos, Asian Americans) on leadership development.

Athletics

Examinations of college athletics can typically be divided into studies examining student participants in formal intercollegiate athletics versus those engaging in informal intramural experiences, although these differences are not always clearly delineated in the literature. Early research examining the influence of collegiate athletic involvement on leadership development using a national sample and numerous control variables identified a positive relationship between participation and developmental gains (Ryan, 1989). Astin (1993b) found a positive relationship between intramural involvement in particular and self-reported leadership gains using CIRP data. This finding was replicated with later CIRP data examining differences by race (Kezar & Moriarty, 2000). Researchers identified participation in intramurals as a significant predictor of leadership ability for White men and both African American and White women (Kezar & Moriarty). A longitudinal study of collegiate athletes and peers reporting no athletic involvement at four highly-selective

institutions found greater self-reported leadership capacities among college athletes (Aries, McCarthy, Salovey, & Banaji, 2004). In a comparative study of African American and White female athletes at 39 institutions, researchers examined the influence of participation on self-reported measures of personal development, including self-confidence to take on leadership responsibilities (Sellers, Kuperminc, & Damas, 1997). Researchers found no significant differences across groups as well as high degrees of perceived advantage in leadership ability based on participation in college athletics (Sellers et al.). Finally, in his study on student orientations toward leadership, Thompson (2006) identified participation in college athletics and intramurals as a significant contributor to more complex and systemic approaches.

Service Experiences

Research on the influence of involvement in community service, volunteerism, and service learning experiences suggests a positive influence on leadership development (Astin, Keup, & Lindholm, 2002; Pascarella & Terenzini, 2005). More complex studies using longitudinal, CIRP data and substantial controls identified significant gains in leadership ability for students involved in service (Astin & Sax, 1998; Astin, Sax, & Avalos, 1999; Astin, Vogelgesang, Ikeda, & Yee, 2000; Cress et al., 2001) and that volunteer work entered regression models as a significant predictor of leadership gains for both African American and White men as well as White women (Kezar & Moriarty, 2000). Another study using a sub-sample of CIRP data from six United Methodist affiliated institutions found religiously oriented community service to have a significant and positive effect on students' achievement orientation, a composite measure that included students' self-reported leadership

ability (Berger & Milem, 2002). It is important to note, however, that these studies all suffer from the same definitional limitations around how they measure leadership as foundational research on the subject matter.

Several smaller studies examining influences of service on leadership development are worthy of discussion as well. Thompson (2006), in his examination of philosophical orientations towards leadership, did not identify community service as a contributing resource towards more complex and systemic conceptualizations of leadership amongst students. However, a single institution, theoretically grounded, exploratory analysis of student leadership identified significant differences in self-reported leadership capacity between students involved in service and those with no service involvement across the following leadership values: consciousness of self, congruence, commitment, collaboration, common purpose, and citizenship (Dugan, 2006b). These differences represented a positive relationship between involvement in service and all leadership measures (Dugan). The author also identified community service as the involvement experience that contributed to the greatest gains across the broadest set of leadership values (Dugan).

Formal Leadership Training Experiences

Cress et al.'s (2001) use of CIRP data and supplemental surveys remains the strongest and most sophisticated examination of influences of participation in formal training programs on leadership development. The study is considered foundational research and was included in the macro-level section despite its inclusion of several other involvement variables in the design. The researchers found that involvement in formal leadership activities was significantly and positively related to gains across

five leadership-related outcome measures (Cress et al.). Few other studies have examined formal, co-curricular leadership training programs opting instead to examine curricular influences. A single-site study of students involved in formal, co-curricular leadership training programs identified significant differences in leadership ability in the theoretically derived measures of common purpose and citizenship for participants versus non-participants (Dugan, 2006b). These differences represented a positive relationship between participation in formal leadership programs and leadership measures.

Other Group Experiences

Little to no published research exists on a variety of other group experiences including paraprofessional positions, academic clubs, art-related organizations, governance groups, religiously-affiliated clubs, and military associations to name just a few. Two studies using longitudinal CIRP data did identify additional co-curricular group experiences related to leadership. Kezar and Moriarty (2000) found involvement in ROTC to be a significant predictor of leadership ability for both African American and White men and serving as a resident assistant a significant predictor for White men and White women. Antonio (2001) examined the influence of involvement in student governance groups and ethnic student organizations on students with racially homogenous versus heterogeneous friendship groups. Participation in governance groups was a significant predictor of leadership ability for both populations, while participation in ethnic student groups was not a predictor for either population (Antonio). An additional study using data collected at a single campus found that neither arts-related groups nor political organizations (e.g., student

governance groups) emerged as significant contributing resources towards more complex understandings of leadership (Thompson, 2006). Ethnography was used as a means to examine the influence of participation in a religiously–affiliated student club on student learning and mobilization (Magolda & Ebben, 2006). The researchers found that involvement in the organization provided a platform for the development of substantive leadership skills (Magolda & Ebben). Finally, in a study of the impact of involvement in lesbian, gay, bisexual, and transgender organizations, researchers found membership was related to positive gains across the developmental stages associated with the LID model (Komives et al., 2006; Renn & Bilodeau, 2005a, 2005b).

The above research using micro-level approaches is particularly focused on a small number of co-curricular group experiences such as fraternity and sorority membership, athletics, and community service. The myriad of other experiences have received only limited attention in the literature or no attention at all. The lack of research in these areas is likely a result of two specific issues. First, there may exist a general assumption that all co-curricular group experiences affect students in similar ways. However, researchers should be looking for differential affects based on type of co-curricular group experience and patterns of student involvement across them (Gellin, 2003; Foubert & Grainger, 2006; Hernandez et al., 1999; Hoffman, 2002; Moore et al., 1998; Renn & Bilodeau, 2005a). Second, researchers regularly presume leadership ability for those that are involved as members and especially as positional leaders in student organizations. As such, research regularly examines the effects of

these types of involvement on a variety of other educational outcomes, but rarely addresses the influence on leadership development itself.

Final Summary of Literature

The literature covered in this review represents key theoretical and empirical contributions that directly influence the understanding of co-curricular group experiences and their impact on college student leadership development. The theoretical model for this study is grounded in the work of Astin (1984) and Pace (1984) on student involvement and the role of the collegiate environment in shaping educational gains. The work of Newcomb (1962) and Weidman (1989) provide a rationale for looking specifically at co-curricular group experiences more closely as a source for student development. Finally, leadership development is identified as a key college outcome along with an overview of theoretical underpinnings of the phenomenon and specific assumptions associated with college student leadership development.

Research connecting involvement in co-curricular group experiences and college student leadership development was explored in depth and divided based on measurement approach (i.e., macro and micro-levels). A third measurement approach (i.e., the seemingly scattershot selection of group experience variables) was observed in the literature as well. Research in this area typically suffers from two core issues. First, the ways in which leadership is defined and measured differ significantly between studies and are rarely grounded in the theoretical knowledge-base associated with college student leadership. This results in difficulty in the comparison of findings across studies as well as a disconnect between research, theory, and practice.

Furthermore, many of the ways in which leadership is measured are in direct opposition to the post-industrial paradigm of leadership, which removes the centrality of position and power. Yet, many researchers include obtainment of positional leadership roles as the sole or key indicator of actual ability. Second, few studies compare the differential effects of various types of group experiences or how patterns of student involvement across multiple experiences relate to developmental progress (Gellin, 2003; Foubert & Grainger, 2006; Hernandez et al., 1999; Hoffman, 2002; Moore et al., 1998; Renn & Bilodeau, 2005a). This is critical as it would provide important insights into which educational experiences best serve student learning. This issue also highlights the flaw in existing literature related to the inability to compare results across studies due to substantively different ways of operationalizing the terms involvement and leadership.

CHAPTER 3: METHODS

This chapter builds upon the existing rationale and analysis of literature on college student involvement in co-curricular group experiences and the influence on leadership development by outlining a research study that empirically examined the subject matter more closely. Design choices related to this investigation are examined in detail and connected directly with justifications from previous research. The chapter includes a review of the purpose of the study, research questions, and hypotheses, discussion of the conceptual framework, and detailed descriptions of study procedures and analytic approaches.

Purpose of Study and Hypotheses

The purpose of this study was to expand knowledge regarding college student involvement in co-curricular group experiences. Specifically, three questions guided the research:

1) Do underlying, latent dimensions differentiate between patterns of student involvement across 21 types of co-curricular group experiences and can they be used for classification of students into subgroups?
2) Are there significant differences between subgroups on a theoretical measure of leadership development?
3) Are there significant relationships between key demographic characteristics (i.e., race and gender) and student subgroups?

Findings should contribute to a useful classification system that illustrates the co-curricular group involvement patterns of college students. The first question builds upon existing taxonomies of college student subpopulations (e.g., Astin, 1993b; Clark

& Trow, 1966; Kuh et al., 2000) to explore in depth students that traditionally fall within categories typified by involvement with the college environment and student group experiences such as clubs and organizations. In previous research these students were labeled collegiates (Astin; Clark & Trow), social activists or leaders (Astin), and socializers or conventionals (Kuh et al.) respectively. The secondary questions examine the degree to which latent classes within the emergent taxonomy differentiate between student outcomes and demographic variables. Due to the exploratory nature of this inquiry and the relative dearth of existing literature on patterns of student involvement (Hernandez et al., 1999; Moore et al., 1998), it becomes difficult to identify measures with which to test for convergent and discriminant validity. Literature exists on traditional corollaries with categories of existing typologies (Astin, 1993b; Kuh et al., 2000), however none of those taxonomies focused directly on the combined use of behavioral variables and peer reference groups, nor were they generated through the analysis of latent patterns. Thus, their use could significantly bias results when applied to this sample. As such, the challenge becomes how to further validity of an emergent taxonomy. Supplemental steps taken in the analytical process for the first question (i.e., splitting the sample and replicating results with the second half) contribute to establishing validity (Krathwohl, 1998; McMillan & Schumacher, 2001). Another means would be to determine whether the individual latent classes have the ability to discriminate between one another. In other words, are they actually measuring meaningfully different segments of the student population? Secondary questions specifically address this issue by attempting to demonstrate differential relationships for which

the subgroups truly discriminate among students (Krathwohl). The hypotheses and related support materials for each of the research questions are provided below and flow in the same order as they are listed in the above section.

Hypothesis 1

Patterns of college student involvement across 21 types of co-curricular group experiences will reflect latent classes representing a taxonomy. This taxonomy will represent underlying patterns of student involvement across multiple experiences based on commonalities among and between student interests and breadth of group experiences. The number and composition of categories is difficult to hypothesize given this study is largely exploratory. Previous researchers have used only conceptually derived categories that typically bias to either a scattershot approach (i.e., a seemingly random set of group experiences), the macro-level (i.e., student involvement experiences in general), or micro-level (i.e., a single, highly specific group experience such as peer educators, athletics, social fraternities) and rarely examine patterns of involvement or similarities and differences in how group involvement experiences influence one another (Hernandez et al., 1999; Moore et al., 1998). It is expected, though, that at least one latent dimension will emerge that differentiates between classes based on the amount of breadth in student involvement (i.e., how many different types of group experiences during college). Whether or not the various dependent indicator variables (i.e., co-curricular group involvement experiences) can be classified into subgroups around the single latent dimension is unknown. It could be that additional latent dimensions associated with student motivations for involvement (e.g., career advancement, social support) or the central

function of the group experience (e.g., recreation, political advocacy) emerge to differentiate between classes as well.

Hypothesis 2

Membership in latent classes will contribute to significant differences in student scores on a theoretically derived measure of leadership. Prior research identifies general student group involvement (i.e., a macro-level approach to measurement) as positively contributing to leadership-related outcomes (e.g., Astin, 1993b; Cress et al., 2001; Smart et al., 2002). Other studies connect more specific types of student group involvement (i.e., a micro-level or scattershot approach to measurement) to leadership-related outcomes (e.g., Antonio, 2001; Aries et al., 2004; Astin & Sax, 1998; Kimborough, 1995; Thompson, 2006). Fewer studies use theoretically derived leadership models to explore the influence of group involvement experiences on leadership development, although those that have identify similar positive results (e.g., Dugan, 2006b; Posner, 2004; Renn & Bilodeau, 2005a). However, no studies to date have examined latent patterns of involvement (Hernandez et al., 1999; Moore et al., 1998). These gaps in empirical knowledge contribute to difficulty in constructing a hypothesis. However, scattershot approaches in measurement have shown unique differences in the degree to which group experiences influence leadership outcomes (Dugan; Kezar & Moriarty, 2000; Thompson). Thus, it stands to reason that unique patterns of involvement may differentiate in similar ways that individual experiences do.

Hypothesis 3

There will be significant relationships between latent class membership and the demographic variables of race and gender. Research on this topic has produced mixed results with some studies identifying significant differences in both the quantity and type of involvement in co-curricular group experiences based on race (Arminio et al., 2000; Fischer, 2007) and others indicating no significant differences (DeSousa & King, 1992; Kuh et al., 2000; MacKay & Kuh, 1994; Watson & Kuh, 1996). However, one study using a sophisticated analytic approach, albeit at a single campus, may explain these divergent findings with the conclusion that there are significant differences, but they are the result of the amount of variance present in student reports about involvement (Hoffman, 2002). The researcher suggests that students of color report more dichotomous involvement experiences (i.e., either heavy amounts of involvement or total lack of involvement), while White students report moderate levels of involvement (i.e., rarely are they heavily or not involved) (Hoffman). Research on the differential experiences of college men and women and their respective values, attitudes, and degrees of educational outcome attainment supports the hypothesis that there would be significant compositional differences by gender (Sax & Harper, 2007; Smith, Morrison, & Wolf, 1994; Whitt, Pascarella, Elkins Nesheim, Marth, & Pierson, 2003). This notion is further bolstered by research citing that different types of college involvement have different effects on student learning based on gender (Kezar & Moriarty, 2000).

Conceptual Framework

The influence of the conceptual framework employed in the national study demonstrated a more indirect influence on this research with implications for understanding the manner and approach to data collection more than the actual analytic approach. Nevertheless, it is critical to understand as a means to frame the overall research design. The conceptual framework was an adapted version of the college impact model posited by Astin (1991). This model, known as the inputs-environment-outcome model (IEO), permits the researcher to "assess the impact of various environmental experiences by determining whether students grow or change differently under varying environmental conditions" (Astin, 1993b, p. 7). Essentially, it provides a framework for researchers to examine differential effects of the college context on outcomes after reducing biases associated with pre-college student characteristics (Astin, 1991).

A traditional IEO design assumes data collection occurs at minimally two different points in time to accurately capture change (Astin, 1991). For the purposes of this study, the model was adapted from its intended pre/ post, longitudinal assessment format to a retrospective design in which data were collected at a single point. This was accomplished by asking students to reflect retrospectively on past knowledge and experiences. Researchers have found that this then/ now approach, when used to study self-reported leadership development, provides a less conservative and more accurate measure of the phenomena by reducing the amount of response shift bias (Howard, 1980; Howard & Dailey, 1979; Rohs, 1999, 2002; Rohs & Langone, 1997).

Research Design

This quantitative study employed a causal comparative design to answer the stated research questions. Causal comparative designs rely upon pre-existing groups for data collection and do not manipulate independent variables (Krathwohl, 1998; McMillan & Schumacher, 2001; Mertens, 2005). This design method was most appropriate given the scope of the study and ethical issues associated with withholding treatments, defined here as self-selected involvement in co-curricular group experiences, from participants. Standard survey research techniques were employed using the internet as the mode of delivery along with principles of web-based design (Crawford, McCabe, & Pope, 2005; Groves et al., 2004).

Data used in this study were collected as part of the Multi-Institutional Study of Leadership (MSL). The purpose of the MSL was to enhance knowledge regarding contemporary college student leadership development as well as the influence of higher education as a context in which building leadership capacity occurs (Dugan et al., 2006). This was accomplished by examining student leadership outcomes with specific attention paid to environmental factors that influenced leadership development (Dugan et al., 2006). The next sections provide an overview of the design including sampling strategy, instrumentation, and data collection.

Sample

The sampling strategy employed for MSL consisted of two distinct phases. The first phase involved the solicitation and selection of participating colleges and universities from throughout the United States. The second phase involved protocols

for selecting student samples from each of the participating campuses. A detailed description of both phases is provided.

Institutional Sample

The selection process for participation in the MSL was initially advertised across three listservs comprised of faculty and administrators working in student affairs or leadership education. This request for applications for participation generated a pool of approximately 150 institutions interested in the research. From this group, a total of 55 schools were selected based on the judgment of the researchers and standard purposeful sampling procedures designed to maximize variation across institutions and best capture the diversity present in American higher education (McMillan & Schumacher, 2001). The MSL research team identified a set of key criteria used in this process (See Appendix A for master criteria list), which included consideration for: geographic region and location, institutional control, institutional size, Carnegie classification, and population served (e.g., Historically Black Colleges and Universities, women's institutions, Hispanic Serving Institutions) among other factors. Criteria were also established to identify the degree to which leadership education was institutionalized to ensure the final sample represented schools ranging from those with comprehensive leadership programs to those with no formalized program. Finally, criteria also took into consideration the degree to which the institution was familiar with and used the social change model of leadership development (HERI, 1996) as a theoretical basis for educational practice. Schools were selected with varying degrees of use of the social change model. Of the 55 schools invited to participate in the study, two schools dropped out of the process

prior to data collection due to time constraints, and one institution was unable to follow study protocols resulting in a low response rate and unusable data. A total of 52 schools completed data collection and are represented in the overall sample (See Appendix B for a list of participating campuses). Of these, 50 institutions are used in this study. Community colleges were removed given the desire to look at patterns of student involvement over four years.

Student Sample

Participating institutions with a total undergraduate enrollment of less than 4,000 students provided full population samples. All other institutions drew a simple random sample of students from their total undergraduate population. Given the number of participating campuses and wide range of institutional sizes, schools were provided the exact number of students to draw for their sample. This number was calculated using a desired confidence level of 95% and a $\pm$3 confidence interval. The number generated was then increased by 70% to enhance the probability of acquiring the desired 30% response rate typical in web-based survey research (Couper, 2000; Crawford et al., 2001). Intentional oversampling not only enhances the overall return rate, but also reduces analysis limitations associated with small cell sizes for subpopulations (Krathwohl, 1998).

The total sample size for the MSL was 155,716 students of which 56,854 submitted usable surveys. The resultant return rate of 37% exceeded the standard rate achieved in web-based survey research (Couper, 2000; Crawford et al., 2001). Data for this study were further reduced across five dimensions given the nature of the research questions. First, any cases in which the respondent failed to complete at least

90% of the core survey (i.e., the 68-item block of questions associated with measurement of the social change model of leadership) were eliminated. A total of 6,476 cases were removed bringing the final number of responses to 50,378. Removed cases were not significantly different from the total group of responders across basic demographic variables. Second, data from the two community colleges in the sample were removed given the amount of data representing these institutions were significantly less than that from four-year institutions and a goal of this study was to examine patterns of involvement that evolved over at least four years. Third, the MSL sample significantly over-represented full-time students (94% of overall sample), so data from part-time students were removed as well. Fourth, only students that identified as seniors were used in these analyses to ensure sufficient time for participation in co-curricular group experiences and the various patterns in involvement to emerge over the course of the collegiate experience. Additionally, only cases in which the participant reported involvement in at least one co-curricular group experience were used as a means to examine the traditional typology category of the collegiate in depth (Astin, 1993b; Clark & Trow, 1966; Kuh et al., 2000). Finally, standard data cleaning procedures were used to ensure the quality and accuracy of responses (Tabachnick & Fidell, 2007). This included the removal of outliers, duplicate cases, potentially falsified data, and any cases with missing data across the 21 dichotomous, dependent variables (i.e., group involvement experiences). Outliers were defined by examining the total number of types of group experiences students participated in over the course of their college career. Any cases representing less than 1% of the sample (i.e., participants reported involvement in 13

to 20 types of group experiences) were removed. A total of 104 cases were removed at this final stage.

The final sample for this study totaled 11,209 participants. Transfer students comprised 31% (n = 3,475) of the sample and 12% (n = 1,358) of participants indicated they were first-generation college students. The mean age of respondents was 23 years old (SD = 4.04) with 87% of respondents falling within the age range of 18 – 24. Females (60%, n = 6,723) were slightly overrepresented compared to males (40%, n = 4,443) when examined against the national gender profile of 57% female college students (Chronicle Almanac, 2006). This may have to do with the inclusion of three women's colleges in the study. The racial diversity of this sample, 24% students of color (n = 2,647), is slightly less than the national average at the time of data collection, which was 29% (Chronicle Almanac). Finally, 4% of participants identified as lesbian, gay, or bisexual (n = 395) and a total of 9 students identified as transgender.

Instrument

The MSL survey instrument was comprised of new and pre-existing scales compiled specifically for use in the national study. The overall instrument (See Appendix C) was created by a team of researchers at the University of Maryland, College Park. Instrument design was grounded in Astin's (1991) IEO model with sections of the instrument specifically addressing pre-college characteristics and beliefs, aspects of participants' educational experiences, and college-related outcomes. Instrument content was either generated by the research team or provided with permission from other national studies. Inputs in this study addressed 14

demographic categories (e.g., race, socio-economic status, citizenship status) and 23 pre-college characteristics (e.g., pre-college involvement, grades, efficacy for leadership). Other items were included to measure the degree to which participants engaged with a wide range of collegiate experiences (e.g., mentoring, formal leadership training, internships, socio-cultural discussions with peers). Outcomes from the instrument were tied to the social change model of leadership development (HERI, 1996) as well as several other leadership-related outcomes (e.g., cognitive development, appreciation of diversity, self-efficacy for leadership), although the latter were not used in this analysis.

The MSL instrument relied upon student self-report data. Student self-reports have received considerable attention with regard to their accuracy and ability to adequately measure educational gains, despite the fact that researchers suggest that they can produce accurate results under specific conditions (Anaya, 1999; Astin, 1993b; Bauer, 1992; Gonyea, 2005; Pace, Barahona, & Kaplan, 1985; Pike, 1995). These conditions include rigorous methodological standards as well as ease of participant use (Gonyea). The participant component is characterized by the ability to comprehend questions, the ability to retrieve necessary information, perceived value of the questions being asked, and clarity of response options (Gonyea). When the above is in place, self-reports can generally be considered appropriate. This study was consistent with this consideration given the primary outcome measure underwent previous field-testing in a variety of studies (Dugan, 2006a, 2006b; Haber, 2006; Meixner, 2000; Morrison, 2001; Rubin, 2000; Smist, 2006). Furthermore, a study of self and peer-reported leadership behaviors and the quality of those behaviors found

self-reports of leadership to be generally accurate (Turrentine, 2001). The researcher found that the frequency of self-reported leadership behaviors tended to be slightly inflated, while the self-reported quality of those behaviors tended to be slightly more conservative. In both cases the error rates were low, with 27% of behaviors being inaccurately matched and only 17% of observations of the quality of behaviors inaccurately attributed (Turrentine). This again lends credibility supporting the use of student self-report data for the purposes of this study.

The primary research question in this study relied upon 21 dichotomous, categorical variables used to determine participant involvement in co-curricular group experiences. These variables (See Table 2) were created from a broad analysis of existing student group experiences offered on college and university campuses nationally. The goal was to create a list of categories that avoided a scattershot, macro-level, or micro-level approach, yet was specific enough that there was clear differentiation between groups based on central purpose of the organization. Furthermore, involvement opportunities that were not predicated on substantive group experiences and peer interactions (e.g., study abroad, internships, student employment) were excluded. The emergent list underwent three rounds of review. The first evaluation was conducted by the 19-member MSL research team, which included graduate students, full-time professionals, and a faculty member, all of whom were versed in the nature of student group involvement. This process involved generating a list of co-curricular group experiences that was as exhaustive as possible and then narrowing back down to a number that balanced specificity with

Table 2

Co-Curricular Group Experience Variables and Example Experiences

Variable	Descriptive Examples
Academic/ Departmental/ Professional	Pre-law society, academic fraternity, engineering club
Arts/Theater/Music	Theater group, marching band
Campus-wide programming groups	Program board, film series board, multicultural programming committee
Cultural/ International	Black Student Union, German Club
Honor Society	Omicron Delta Kappa (ODK), Mortar Board, Phi Beta Kappa
Living-learning programs	Language house, leadership floors, ecology halls
Leadership	Peer leadership program, emerging leaders program
Media	Campus radio, student newspaper
Military	ROTC, cadet corps
New Student Transitions	Admissions ambassador, orientation advisor
Para-professional group	Resident assistants, peer health educators
Political/ Advocacy	College Democrats, Students Against Sweatshops
Religious	Campus Crusades for Christ, Hillel
Service	Circle K, Alpha Phi Omega (APO)
Culturally based fraternities and sororities	National Pan-Hellenic Council (NPHC) groups such as Alpha Phi Alpha Fraternity, Inc., Latino Greek Council groups such as Lambda Theta Alpha Latin Sorority, Inc.
Social fraternities or sororities	Panhellenic or Interfraternity Council groups such as Sigma Phi Epsilon or Kappa Kappa Gamma
Sports- Intercollegiate or Varsity	NCAA hockey, varsity soccer
Sports- Club	Club Volleyball
Sports- Leisure or Intramural	Intramural flag football, rock climbing club
Special Interest	Comedy Group
Student governance group	Student Government Association, Residence Hall Association, Interfraternity Council

generalizability across campus types. The development of this list was aided by examining published records of student group experiences at institutions across the country. The final list was comprised of 22 variables and demonstrated face validity to the expert panel that created it.

The second round of evaluation involved feedback from representatives from the 55 selected campuses. These individuals possessed expert content knowledge on the subject matter from their positions in institutional research or student activities offices at a variety of institutional types. Specifically, they were asked to review the instrument to determine the degree to which questions would be understood by students at their campus and reflect co-curricular group experiences that were available. The MSL research team discussed feedback, which led to an adapted list with 21 total variables. Key changes included switching the variable labeled "ROTC" to "Military" to make the grouping less specific (i.e., less of a micro-level approach) and to be inclusive of experiences such as cadet corps. For similar reasons, the variable labeled "Student Government" was changed to "Governance" and examples added to include governance across a number of types of experiences (e.g., residence hall associations, interfraternity councils). Two separate variables, "Political" (e.g., College Democrats, Libertarians) and "Advocacy" (e.g., Students Against Sweatshops, Amnesty International) were merged for better generalizability across campuses and the sake of parsimony. Finally, a variable was created to capture "New Student Transitions." The descriptor of orientation counselor was pulled from the "Paraprofessional" variable and used to describe the "New Student Transitions" variable along with the example of admissions ambassadors. This final list was

comprised of 21 total variables listed in alphabetical order so that students could scan through and readily identify groups.

A final evaluation was conducted as part of formal pilot studies and led to changes in the descriptive examples associated with each category as well as a slight change in ordering. A total of 14 participants at a single campus and reflecting a variety of involvement backgrounds (i.e., no experience with involvement in group experiences to highly involved students) provided feedback on the interpretability of the instrument after completing it. A primary suggestion involved the importance of moving "Cultural Fraternities and Sororities" in front of "Social Fraternities and Sororities" so that it was a visible option prior to a general category for Greek-letter organizations. The rationale was that some members of the cultural Greek-letter system have a sense of affiliation with the broader social fraternity and sorority system while others do not. The goal was to reduce the chance of an order effect by switching the sequence of the two variables. Additional small changes were made in the descriptors for each variable, for example adding a non-Christian example of a religious organization. These changes did not alter the final number of variables.

The second research question relied upon MSL items associated with an adapted version of the Socially Responsible Leadership Scale (SRLS) (Tyree, 1998), which measured the social change model of leadership development (HERI, 1996). The original SRLS was comprised of eight separate scales including: Consciousness of Self, Congruence, Commitment, Collaboration, Common Purpose, Controversy with Civility, Citizenship, and Change. The SRLS was created using confirmatory factor analysis (Tyree). Additionally, to increase the accuracy of the measure, the

Crowne-Marlowe Social Desirability Scale was used to remove any items that inappropriately biased responses (Tyree). The initial instrument was comprised of 104-items across the eight scales with participants reporting using a 5-point Likert-like response continuum ranging from strongly disagree (1) to strongly agree (5) (Tyree). A number of studies have employed the instrument with consistent results and strong reliability levels (Dugan, 2006a, 2006b; Haber, 2006; Meixner, 2000; Morrison, 2001; Rubin, 2000; Smist, 2006). Scale reliability for the original instrument ranged from a high of .92 on Citizenship to a low of .71 on Controversy with Civility. The instrument was subsequently reduced to 83-items using standard data reduction techniques prior to the investigation (Appel-Silbaugh, 2005; DeVellis, 2003). The reduced SRLS was used in a pilot study, which led to a further reduction of the instrument to a final total of 68-items using the same techniques (DeVellis; Dugan et al., 2006). Scales range in total number of items from six to 11 in the final version of the instrument. Reliability levels across all eight scales in the original version, revised form, pilot study, and final study are provided in Table 3. Given reliability is a function of using an instrument with a specific population and not the instrument itself (Mertens, 2005), alphas were calculated for each institution in the study as well as by categories in each major student sub-population (i.e., race, gender, sexual orientation). Reliabilities across all of these were consistent and did not deviate by more than .12.

Table 3

Reliability Levels for SRLS in Various Formats

Scales	Original[a]	Revised Format[b]	MSL Pilot[b]	MSL[c]	This Study[c]
Consciousness of Self	.82	.78	.83	.79	.78
Congruence	.82	.79	.85	.80	.79
Commitment	.83	.83	.87	.83	.82
Collaboration	.77	.80	.83	.82	.80
Common Purpose	.83	.81	.87	.82	.80
Controversy with Civility	.69	.72	.77	.77	.75
Citizenship	.92	.89	.92	.77	.75
Change	.78	.82	.83	.81	.81
Omnibus SRLS	-	-	-	.96	.96

[a]103-item instrument (Tyree, 1998). [b]83-item instrument (Appel-Silbaugh, 2005). [c]68-item instrument (Dugan et al., 2006).

Post data collection, a correlation matrix revealed strong degrees of intercorrelation (r = .45 to .77) among the eight measures associated with the social change model. A principal component analysis using Oblimin rotation was conducted as a means to examine the factor structure among the eight scales. This analysis revealed a single factor solution that explained over 70% of the variance in the eight measures and demonstrated a high degree of reliability (Chronbach alpha = .96). This omnibus-SRLS was used as the dependent variable for the second research question.

Data Collection

Human Subjects Permissions

Human subjects permission was obtained for the overall MSL study through the University of Maryland, College Park and covered this research project. See Appendix D for a copy of the IRB approval for this study and Appendix E for the most recent IRB renewal notification. Institutional Review Board (IRB) approval was also sought at each of the 52 participating campuses. Those institutions without a human subjects board provided written documentation from their chief institutional

researcher or vice-president for student affairs stating that study protocols were consistent with institutional policy and the national IRB requirements would govern data collection on their campus. Although study protocols were standardized and approved under the national IRB, some institutions were permitted to make changes determined to be more rigorous in nature (e.g., additional explanation or specific language in consent forms) and required by their individual human subjects processes. These adaptations were documented with the University of Maryland IRB.

Pilot Studies

Two pilot studies were conducted during the fall of 2005 in advance of the primary data collection. The first pilot study was conducted with 14 undergraduate student volunteers using a paper and pencil version of the instrument. These students represented a diverse array of demographic characteristics and range of university experiences including those without any formal involvement on campus. The pilot study was specifically designed to solicit qualitative feedback on the survey instrument as well as gauge item clarity, perceived burden, and completion rates. Upon finishing the survey instrument, each participant completed a debriefing interview with a member of the research team. Results provided key insights into question comprehension as well as the level of burden for participants. Post-test interviews revealed the instrument was too long and needed to be shortened to reduce the average completion time of 30 - 35 minutes. Several scales were removed that related indirectly to the purpose of the MSL study. The decision was also made to use four scales (i.e., cognitive development/ identity development, student activism, developmental work opportunities, and student governance influences) as sub-studies

with each to be randomly administered to 25% of the participants from an institution's random or full-population sample. This allowed for a further reduction of the total number of items on the instrument.

The second, web-based pilot test was conducted in December 2005 using a simple random sample of 3,000 undergraduate students from the University of Maryland, College Park. This pilot test followed the protocols established for the primary study and served as a means to establish content and construct validity for newly created scales, test reliability of pre-existing scales, and re-examine completion time and overall burden on subjects. A total of 782 participants responded to the instrument contributing to a return rate of 23%. The distributions among demographic groups were consistent with institutional demographics (Dugan et al., 2006). Completion time was reduced to 25 – 30 minutes, which was still deemed too significant a burden and contributing to the low response rate. Researchers revisited the SRLS block of questions and made a final set of item reductions as detailed in the previous section. Additionally, the pilot study revealed that the final block of eight items were consistently missing data due to participant drop off rates. This issue was addressed using an internet survey design technique that involved splitting the SRLS into eight blocks each of which was internally and externally randomized. In other words, a number of different variations of the question order and block order allowed missing data to be spread across the entire set of SRLS questions rather than limited to the final few items. These changes contributed to a final completion time of approximately 20 minutes.

Data Collection

Data collection was conducted from January 20th, 2006, to March 8th, 2006, with each institution assigned a 3-week window that fell at least two weeks after the start of its academic semester, but prior to midterm exams. Data collection was limited to the second semester to ensure that first-year and transfer students had ample time to become familiar with the institutional environment. The survey was conducted completely via the web with students receiving up to four email invitations to participate. Email invitations were individually addressed and sent at four day intervals with no additional emails sent once the participant completed the survey or opted out of responding. See Appendix F for a copy of the template used by each institution to construct this email. Appendix G and H contain templates for subsequent contact emails.

Emails varied slightly by institution based on individual incentive plans. Each institution was encouraged to develop an individualized incentive plan to enhance motivation to complete the instrument. Participants that completed the instrument in its entirety were entered into a raffle for prizes. Incentives ran the gamut from i-Pods and X-Box 360 game systems to university parking passes and food coupons. Only respondents from the specific institution were eligible for its individual incentives. All respondents were eligible for a set of national incentives that included four i-Pod Nanos, a free registration for the LeaderShape Institute, and a $50 gift card to Old Navy clothing store.

Embedded in the contact email was a unique identification number used to access the actual survey. Participants clicked on a hyperlink embedded in the email or

inserted the URL directly into a web browser to access the survey. An initial screen prompted them to input their unique identification number. Once entered, they were presented with a consent form outlining the purpose of the study and nature of risks (See Appendix I). Participants agreed to the parameters of the study by clicking on a button indicating consent after which a new unique identification number was assigned to them and the previous one erased. All responses were directed to a new database that could not be linked to the original database to protect confidentiality for participants. The final average completion time for the survey was 20 minutes.

Data Analysis Plan

This section outlines the analytic approach planned for each of the research questions in the study.

Research Question 1

The first research question explored whether or not latent phenomena could be identified to assist in the classification of students into subgroups based on their patterns of involvement across 21 types of co-curricular group experiences (e.g., political groups, student governance, club sports). Both cluster analysis and latent class analysis were considered as analytic techniques to examine the first hypothesis. Cluster analysis, an interdependence technique, is often used in this type of research as a method of identifying structure among cases along a selected set of variables (Everitt et al., 2001; Hair et al., 1998; Hair & Black, 2000). Cluster analysis is essentially a grouping method in which individuals are organized into clusters that maximize internal homogeneity as well as between cluster heterogeneity (Everitt et al.; Hair et al.; Hair & Black). However, a number of characteristics of data from this

study made cluster analysis a difficult fit for this research. The various methods of cluster analysis each possess restrictive dimensions that would require data be force-fitted to the technique as opposed to supporting it. Specifically, hierarchical cluster analysis allows for the use of dichotomous variables (Finch, 2005), but typically is restricted to use with small data sets (e.g., under 500 cases) given the complexity of algorithms used and procedures for interpreting the final number of groupings (Finch; Hair et al.). Data from this study were reduced to a level that could be processed by standard computers, but were not small enough to ensure the accuracy of the interpretive process. Conversely, nonhierarchical cluster analysis allows for the grouping of large data sets, but variables must be continuous (Finch; Hair et al.; Hair & Black). A third type of cluster analysis, two step, relies on hierarchical techniques, but pre-clusters data to allow for the analysis of larger data sets (Everitt et al.). Two step also allows for both continuous and categorical data, but cannot use data that is either dichotomous or interval (Everitt et al.). Thus, while cluster analysis is the more generally understood technique, this data had a number of characteristics that made the analytic approach inappropriate for this research.

Given the issues related to use of cluster analysis, latent class analysis was selected as the analytic technique to answer the first research question. Latent class analysis is a technique similar to cluster analysis, but more appropriate for use with dichotomous data representing unobservable or latent phenomena (Dayton, 1998). Table 4 provides a list of common terms associated with latent class analysis along with their definitions. The technique identifies subtypes, or categories, of mutually exclusive and exhaustive latent classes in multivariate, categorical data (McCutcheon,

Table 4

Common Terms Associated with Latent Class Analysis

Term	Description
Bayesian information criterion (BIC)	Goodness of fit measure that takes into account parsimony and is effective with large samples
Classification error	The proportion of cases that are misclassified when classification is based on modal assignment
Conditional or partial probability	Provide an indication regarding the degree of relation between indicator variables and individual classes
Covariate	Exogenous variables that vary between cases; can be used to predict cases (i.e., active) or for descriptive purposes (i.e., inactive)
Factor level	An ordered (i.e., hierarchical) level describing the distribution of indicator variables across the discrete latent factor
Goodness of fit	Statistical measures that assess the degree to which data fit proposed models
Indicator variable	Dependent variables used to classify cases into latent classes
Latent class	Conditionally independent clusters or subgroups of cases that arise as a function of unobservable patterns identified from indicator variables
Latent factor	Unobservable, underlying variable or dimension that is dichotomous or ordered, discrete, and accounts for patterns of relationship among indicator variables
Loading	Approximate standardized linear regression coefficients describing the relationship between a given latent factor and indicator variables
Local independence	Key assumption of latent class analysis that requires indicator variables to be independent (i.e., uncorrelated) within a given latent class
Modal probability	Classification or assignment to the class for which the case has the highest posterior membership probability
Parameters	Patterns of response that distinguish cases in one latent class from those in another based on conditional response probabilities
Residuals	Provide an indication of the degree of estimated and observed bivariate associations between indicators; used to verify if assumption of local independence is met

Note. Information in this table is drawn from the following sources: Dayton (1998) and Vermunt and Magidson (2005).

1987). Latent classes are defined by the local or conditional independence that is present among variables (Dayton). In other words, when the underlying latent construct is accounted for, the variables used for classification are uncorrelated within a given class (Dayton). Models generated using latent class analyses rely on maximum-likelihood estimates of conditional or partial response probabilities (Dayton). These probabilities are then used to classify cases into particular classes.

Latent class analysis was an appropriate method for this study given the use of dichotomous data, the heterogeneity of the sample, and the established dearth of statistically validated taxonomies relating to patterns of student involvement in co-curricular group experiences. The 21 variables representing group experiences were selected to characterize the breadth of opportunities available to college students today in a diverse array of institutional environments resulting in a heterogeneous data set that was well suited for this analytic approach. Considerable attention was given to variable selection in order to maximize the usefulness of the resulting classification given the role variable selection plays in the model creation process (Magidson & Vermunt, 2004). Additionally, latent class analysis provides an opportunity to significantly extend results generated with techniques (e.g., Q-factor analysis, K-means cluster analysis) in other studies of student taxonomies (Astin, 1993a; Kuh et al., 2000). Each of these studies was limited by the number of variables used to classify students. Latent class analysis, on the other hand, does not associate variables exclusively with a single category or class (Dayton, 1998). Rather, it allows for the examination of underlying patterns of involvement among and between the 21 indicator variables essentially resulting in 2^{21} total patterns with which to classify

students into latent classes. In the case of this study, a total of 5,208 total response patterns were present in the data set.

Latent class analysis offered a further benefit over other approaches through extensions designed to augment exploratory analyses by allowing for analogs to factor analysis (Magidson & Vermunt, 2001). Methodologists recommend beginning exploratory analyses with a traditional latent class modeling approach and subsequently expanding the number of latent classes as well as the number of latent factors (i.e., underlying latent dimensions that describe the data) to achieve the best fit and a more parsimonious result (Magidson & Vermunt). Latent factors are entered into the model by combining dependent variable patterns that are inter-related (i.e., violate the assumption of local independence) in a fashion similar to factor analysis and as a means to restrict the overall model (Magidson & Vermunt). This often results in additional classes, but not an increase in the number of parameters required to estimate the overall model (Magidson & Vermunt).

Given this research question is exploratory in nature, data were randomly split into two separate samples using SPSS software. The separate data sets were then imported into Latent Gold 4.0, a statistical software package used to run latent class analyses (Vermunt & Magidson, 2005). The first set of data was used to explore model solutions, while the second was used for validation purposes. The total number of latent classes in a data set is normally unknown at the start of the research (Dayton, 1998). As such, model fit became an integral component to this exploratory analysis. The decision of how many latent classes existed in the data was based on four criteria: parsimony, model fit statistics, rate of error in classifications, and

meaningfulness of the solution (Dayton; Magidson & Vermunt, 2004). The Bayesian information criterion (BIC), a parsimony technique, was used to measure goodness of fit given its preference for complexity in models and utility with large sample sizes (e.g., over a thousand cases) (Dayton). For the purposes of this study, the BIC was particularly appropriate given data were sparse. Scarcity in a data set occurs when there are a large number of potential response patterns ($n = 2^{21}$) in relation to the number of respondents (n = 11,209). Under this condition it is better to use the BIC as a model selection criterion as opposed to the likelihood-ratio statistic (L^2), which requires data with a chi-squared distribution, which this data set did not have (Vermunt & Magidson).

Once a model was selected using the first data set, a respecification process occurred with the second half as a means to validate the solution. The same process of running models until an adequate solution was obtained proceeded using the same selection criteria. Results from the validation process were used in conjunction with the first analysis to determine the most appropriate model solution. The same process was then conducted a third time on the full sample to ensure a similar solution. The results were then profiled based on the patterns that emerged as salient for each factor and class. Modal and partial probabilities were used to assign class membership and subsequently exported back to SPSS to support analysis of additional research questions.

Research Question 2

The second research question was designed to assess the degree to which various latent classes within the overall emergent taxonomy contributed to

statistically significantly different scores on a theoretical measure of leadership. A one-way, between-groups analysis of variance (ANOVA) with univariate follow-up tests was used to identify significant differences and the extent of their magnitude. The omnibus SRLS was used as the dependent measure given its theoretical grounding using the social change model of leadership development.

Research Question 3

The third research question examined whether or not there were significant relationships between the emergent taxonomy and the demographic variables of race and gender. This was determined using chi-square tests of independence, a non-parametric test used to examine the relationship between two categorical variables (King & Minium, 2008). These tests required all cell sizes to exceed five cases (King & Minium). As such, categories of race that did not meet this condition were treated as missing to meet the analytic requirements.

Summary Statement

This chapter provided an overview of the research design employed in this study. This included an outline and rationale for the methodological approach, conceptual framework, and data collection plan. Specific attention was paid to how and why the particular analytic technique was selected and its benefits in the context of the primary research question. The next chapter provides a detailed account of the results from this study.

CHAPTER FOUR: RESULTS

The purpose of this study was to explore whether or not latent phenomena could be identified to assist in the classification of students into subgroups based on their patterns of involvement across 21 types of co-curricular group experiences (e.g., political groups, student governance, club sports). Further analyses examined the extent to which the emergent taxonomy truly discriminated between the subgroups that comprised it. This chapter presents findings from these analyses along with an evaluation of results in relation to the hypotheses presented in the previous chapter.

Research Question 1

The first research question examined the extent to which latent phenomena underlie student involvement across co-curricular group experiences and whether they could be used to classify students into subgroups, or latent classes. Exploratory latent class analysis using both factor and cluster-based approaches was employed given evidence of its effectiveness in generating parsimonious and interpretable solutions with a high degree of model fit (Magidson & Vermunt, 2001). For validation purposes, data were randomly split into two sub-samples and the analyses run on each to verify consistency of results (Krathwohl, 1998; McMillan & Schumacher, 2001). The same analysis was then conducted using the full sample. The analytic process is described in detail starting with each sub-sample and culminating with the full sample and eventual classification of cases into classes.

Sub-Sample 1

The first sub-sample of data was comprised of 5,560 cases randomly selected using the SPSS statistical software program. These data were then imported into

Latent Gold 4.0, a software package specifically designed for use with latent class analysis (Vermunt & Magidson, 2005). The 21 types of co-curricular group experiences were entered into the program as dependent indicator variables. Additionally, a variable labeled "range," which represented the sum of the different types of group experiences, was entered as an inactive covariate. Inactive covariates are not included in the estimation of model parameters, but do provide output useful for examining their representation within a model (Vermunt & Magidson). Due to the sparse nature of this data set (i.e., the number of cases is low in comparison to the total number of possible response patterns), a chi-squared distribution cannot be assumed and the model fit likelihood ratio chi-squared statistic (L^2) may not be accurate (Vermunt & Magidson). Thus, the BIC, which is based on log-likelihoods, is a better measure of goodness of fit as it takes into account both the degrees of freedom and number of parameters when evaluating the model (Vermunt & Magidson). The lower the BIC, the better the fit of the model to the data (Dayton, 1998). For the purposes of model selection, the BIC was used as the primary criterion with consideration also paid to classification error rate and degree of interpretability of resultant classes.

Per recommendations from methodologists, the analytic flow began with the exploration of latent class cluster solutions with up to four classes all describing a single underlying dimension, or latent factor (Magidson & Vermunt, 2001). Table 5 provides model statistics for each of these. With each additional class the BIC went down, while both the number of parameters and degree of classification error increased. At this point in the analysis, it was appropriate to see if the addition of a

second latent dimension, or factor, improved model fit (Magidson & Vermunt). Latent factors are assumed to be dichotomous and are represented by ordered (i.e., hierarchical) levels (Vermunt & Magidson, 2005). The addition of a second latent factor generates a restricted version of the four class cluster model; the number of latent classes is the same, although the number of parameters is significantly less (Magidson & Vermunt). Further evidence for examining additional latent factors in this data was derived from the presence of significant residuals among the 21 indicator variables. This was an indication that the assumption of local independence may have been violated; however this could be controlled for by adding latent factors.

Table 5

Comparison of Goodness of Fit for Models from Random Data Set 1

Model	BIC [b]	Parameters	L^2 [c]	*df*	*p*-value	Classification Error
1-Class	104163	21	24692	5539	0.00	0.00
2-Class	100870	43	21209	5517	0.00	0.09
3-Class	100310	65	20458	5495	0.00	0.18
4-Class	100130	87	20089	5473	0.00	0.21
2-Factor (8,2)	100633	52	20894	5508	0.00	0.24
3-Factor (8,2,2)	100001	76	20055	5484	0.00	0.21
4-Factor (8,2,2,2)	99607	101	19445	5459	0.00	0.30
5-Factor (8,2,2,2,2)	99589	127	19204	5433	0.00	0.30
4-Factor (7,2,2,2)	99598	100	19445	5460	0.00	0.31
4-Factor (6,2,2,2)	99592	99	19448	5461	0.00	0.21
4-Factor (5,2,2,2) [a]	99579	98	19443	5462	0.00	0.27
4-Factor (4,2,2,2)	99588	97	19461	5463	0.00	0.28

Note. $n = 5{,}560$.

[a]The 4-Factor (5,2,2,2) model is determined to have the best model fit.
[b]Bayesian information criterion.
[c]Likelihood ratio chi-squared statistic.

Output from the range covariate across the first four cluster models suggested that it likely represented the underlying latent factor and was confounding the ability to examine other latent dimensions (i.e., it was causing a response level effect). In

other words, each of the emergent classes represented a general range in the number of co-curricular group experiences that a participant reported. Latent class analysis allows for the segmentation of a known factor so that its degree of influence on the other factors is partialed out of the model to better examine relative differences (Vermunt & Magidson, 2005). This involved increasing the number of levels of the factor beyond the standard two, allowing for correlations between factors, and assigning equal effects (i.e., all variables contribute equally to a particular factor) (Vermunt & Magidson). Latent class models with between two and five latent factors were estimated using the same dependent indicators and covariate. The first latent factor in each of the models was assigned to represent range and segmented using the above technique. The number of levels for this factor was set to eight as a means to partial out as much of its influence on other factors as possible. The use of eight levels was selected at random knowing the ideal number of levels would need to be assessed once the overall number of latent factors was determined. All other factors contained the standard two levels.

Table 5 shows that the three, four, and five factor models improved in goodness of fit as observed in the reduced BIC in relation to the cluster-based models. Note that the numbers in parentheses that appear in the table next to the model name represent the number of levels present in each of the factors. The five factor model offered the best fit with data (BIC = 99,589), although the solution was only slightly better than the four factor model (BIC = 99,607). Additionally, the number of parameters was significantly higher in the five factor model and it resulted in a total of 10 classes, making interpretability more difficult due to the emergence of classes

into which few participants could be classified. Latent classes that are small in size present an issue of interpretability and draw into question the degree to which the finding is useful to practice. For this reason, the four factor model appeared to offer a better, more parsimonious solution (Dayton, 1998). Further models were estimated using four latent factors, but lowering the number of levels on the segmented first factor to identify an ideal quantity that partialed out its effect on other factors while maximizing model fit. The subsequent four factor models with between seven and four levels are represented in Table 5. The four factor model with five levels on the first factor maximized model fit statistics (i.e., the model demonstrated the lowest BIC) and further reduced the number of parameters (n = 98) and percent of classification error (E = 27%).

The next step in latent class analysis examined the four factor model to determine if the three primary factors (i.e., Factor 2, Factor 3, and Factor 4) differentiated between the indicator variables. Table 6 provides loadings for each indicator across factors, rates of classification error for factors, and the amount of variance explained by both factors and indicator variables. Loadings represent an approximate standardized linear regression coefficient for an indicator variable on a given factor (Vermunt & Magidson, 2005). This provides information on the key indicator variables differentiating between levels of a latent factor. Loadings are not interpreted using standardized cut-off points, but rather by examining each set of loadings as a continuum and identifying variables clustered at relative ends of each spectrum (Vermunt & Magidson, 2005). Note that all the loadings on Factor 1 were significant, negative, and within the same approximate range. This corresponded to

the segmentation conducted to partial out its influence on other factors. Factor 2 was characterized by strong, negative loadings for academic and honors experiences and strong, positive loadings for artistic experiences. Factor 3 reflected strong, negative loadings for intercollegiate athletics, club sports, and intramurals and strong, positive loadings for artistic and cultural experiences. Factor 4 demonstrated strong, negative loadings for programming experiences and strong, positive loadings for academic, artistic, honors, religious, service, social Greek-letter, intercollegiate athletic, club sport, and intramural experiences. The overall level of variance explained was above

Table 6

Variable Contributions for 4-Factor (5,2,2,2) Model in Random Data Set 1

Group Experience Variables	Factor 1	Factor 2	Factor 3	Factor 4	R^2
Academic	-0.37**	-0.39**	-0.03	0.21**	0.28
Arts	-0.38**	0.25**	0.29**	0.27**	0.11
Programming	-0.31**	-0.02	0.08	-0.23**	0.28
Cultural	-0.37**	0.16**	0.27**	0.05	0.17
Honors	-0.42**	-0.40**	0.02	0.34**	0.33
Living-Learning	-0.30**	0.06	0.09**	0.03	0.09
Leadership	-0.39**	-0.11**	-0.02	-0.11*	0.27
Media	-0.32**	0.17**	0.08**	0.14**	0.06
Military	-0.16**	0.12**	-0.04	0.15**	0.02
Student Transitions	-0.34**	-0.09*	0.07	-0.09*	0.21
Paraprofessional	-0.26**	-0.03	0.06	-0.06	0.12
Political	-0.37**	0.11**	0.11**	0.12**	0.08
Religious	-0.44**	0.14**	0.13**	0.30**	0.07
Service	-0.41**	-0.04	0.05	0.20**	0.10
Cultural Greeks	-0.18**	0.08**	0.06	-0.01	0.05
Social Greeks	-0.39**	0.07*	-0.18**	0.24**	0.10
Intercollegiate Athletics	-0.27**	0.16**	-0.24**	0.30**	0.12
Club Sports	-0.30**	0.11**	-0.36**	0.25**	0.20
Intramurals	-0.37**	0.11*	-0.50**	0.31**	0.33
Special Interest	-0.38**	0.15**	0.06*	0.17**	0.07
Governance	-0.33**	-0.06	-0.01	-0.13*	0.23
Standard R^2	0.67	0.48	0.50	0.50	-
Classification Error	0.27	0.18	0.17	0.14	-

Note. Group experience variable names are shortened for readability. n = 5,560.
* $p < .01$. **$p < .001$.

50% for each of the factors with relatively low rates of classification error ($E \leq 18\%$) across the three primary factors. These results suggested a clear differentiation between indicators on factors and that the model yielded meaningful findings.

The next phase of analysis considered factor level size and conditional partial probabilities for classification into membership in the varying levels of each factor. The relative size of levels in Factor 2 and Factor 3 showed an almost even split, a sign of strong differentiation between involvement patterns by the latent factor (See Table 7). The size difference between levels on Factor 4 was less balanced, but still within reason to distinguish patterns (Vermunt & Magidson, 2005). Conditional partial probabilities were used in this analysis given the presence of more than one latent factor and reflect the strength of the effect of the factor on the indicators (See Table 7) (Vermunt & Magidson). It is important to note that these probabilities do not reflect mutually exclusive classifications, but the likelihood that a group experience is observed or not observed within a given factor level (Vermunt & Magidson). They are useful primarily for descriptive purposes. Interpreted in conjunction with the factor loadings, it becomes clear when differences in probability for participation between levels reflect the underlying latent pattern versus a random effect. For example, in Factor 2 there was a 7% higher probability for involvement in student transitions for Level 2 than Level 1. However, student transitions did not emerge in the loadings as one of the strongest indicators differentiating between the levels. This suggested that it did not contribute as significantly to the underlying latent dimension that Factor 2 represented. A more important difference existed on the honors indicator where the difference in probabilities for involvement between the two levels was

greater (41%) and the loadings situated it as a significant variable describing the underlying latent factor.

Analysis of the first sample determined that the four factor solution with five levels on the first factor best fit the data. This model balanced parsimony and goodness of fit, had low levels of classification error, and resulted in clearly distinguishable and interpretable patterns in student involvement across the three primary factors. Factor 2 differentiated between artistic and academic experiences. Factor 3 differentiated between sports and culture/arts. Factor 4 differentiated between programming and many of the other group experiences.

The next step in this process would typically have explored and interpreted resultant latent classes emerging from the model. Modal probabilities would be generated for each unique pattern of response and then cases assigned to a specific latent class that represents one of the eight variations present from crossing levels from the three primary factors. However, for the purposes of this study, this part of the process was delayed until after data were run on the second sub-sample to see if the same model emerged with the best fit.

Sub-Sample 2

The second sub-sample was comprised of 5,649 cases and analysis followed the same procedure as with the first sub-sample. Table 8 provides model statistics for the first four latent class cluster solutions. As with the previous sample, the BIC dropped with each successive class, residuals pointed to the benefit of examining additional latent factors, and the covariate of range (i.e., breadth of involvement) seemed to represent the dominant latent dimension. Given the above, solutions with

between two and five latent factors were estimated. Segmentation of the first factor was achieved by allowing for equal effects, permitting factors to correlate, and increasing the number of levels on the first factor to eight. Table 8 provides estimations for the models with additional latent factors. As in the first sub-sample, the five factor model had the lowest BIC (BIC = 100,323), but was close in range to the four factor model (BIC = 100,337). The number of parameters (n = 100) in the four factor model was substantially lower as was the degree of classification error. When this was considered in conjunction with issues of parsimony and interpretability, the four factor model was determined to have the best overall goodness of fit. Subsequent four factor models were then estimated to determine an ideal number of levels for the first latent factor. Table 8 provides estimated models for these and shows that the four factor model with five levels in the first factor had the best overall model fit statistics.

Loadings across each of the factors are presented in Table 9. Loadings on Factor 1 were all significant, negative in direction, and within the same general range, which reflected the segmentation process. Loadings for Factor 2 were highly negative for academic and honors groups and highly positive for arts groups as well as the three sports indicators (i.e., intercollegiate athletics, club sports, and intramurals). Factor 3 demonstrated high negative loadings for art and cultural groups and high positive loadings for the three sports indicators. Factor 4 resulted in high negative loadings for programming, leadership, student transitions, and governance groups and high positive loadings for arts, religious, honors, special interest, and the three sports groups. The level of variance explained across the three primary factors ranged

Table 7

Probabilities for Indicators on 4-Factor (5,2,2,2) Model with Data Set 1

	Factor 1					Factor 2		Factor 3		Factor 4	
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2
Level Size	0.51	0.01	0.28	0.12	0.09	0.56	0.44	0.59	0.41	0.70	0.30
Academic	0.32	0.50	0.68	0.82	0.90	0.36	0.77	-	-	0.65	0.32
Arts	0.07	0.14	0.26	0.43	0.62	0.28	0.09	0.29	0.07	0.25	0.06
Programming	0.04	0.08	0.15	0.27	0.44	-	-	-	-	0.07	0.19
Cultural	0.07	0.14	0.25	0.42	0.60	0.23	0.10	0.28	0.07	-	-
Honors	0.15	0.27	0.44	0.63	0.78	0.16	0.57	-	-	0.45	0.11
Living-Learning	0.03	0.06	0.12	0.22	0.38	-	-	0.09	0.05	-	-
Leadership	0.06	0.12	0.22	0.37	0.56	0.10	0.22	-	-	0.11	0.22
Media	0.04	0.09	0.17	0.31	0.49	0.17	0.06	0.13	0.08	0.15	0.05
Military	0.01	0.02	0.04	0.08	0.16	0.05	0.01	-	-	0.04	0.00
Student Transitions	0.04	0.07	0.14	0.26	0.42	0.06	0.13	-	-	0.07	0.13
Paraprofessional	0.02	0.04	0.07	0.15	0.27	-	-	-	-	-	-
Political	0.05	0.11	0.20	0.35	0.53	0.17	0.09	0.16	0.09	0.16	0.08
Religious	0.09	0.17	0.31	0.49	0.67	0.26	0.14	0.26	0.15	0.29	0.08
Service	0.05	0.11	0.20	0.35	0.53	-	-	-	-	0.16	0.07
Cultural Greeks	0.01	0.02	0.04	0.07	0.15	0.03	0.01	-	-	0.02	0.02
Social Greeks	0.07	0.14	0.25	0.41	0.60	0.19	0.12	0.11	0.25	-	-
Intercollegiate Athletics	0.03	0.07	0.14	0.26	0.42	0.15	0.04	0.05	0.19	0.17	0.02
Club Sports	0.05	0.09	0.18	0.32	0.50	0.16	0.07	0.05	0.31	0.18	0.03
Intramurals	0.29	0.46	0.64	0.79	0.89	0.58	0.42	0.28	0.82	0.65	0.21
Special Interest	0.07	0.13	0.24	0.40	0.58	0.21	0.10	0.17	0.13	0.20	0.08
Governance	0.04	0.08	0.15	0.28	0.45	-	-	-	-	0.08	0.15

Notes. Group experience variable names are shortened for readability. n = 5,560. Empty cells represent variables that were not significant ($p > .01$) contributors to the respective factor.

Table 8

Comparison of Goodness of Fit for Models from Random Data Set 2

Model	BIC[b]	Parameters	L^2 [c]	*df*	*p*-value	Classification Error
1-Class	104953	21	24816	5628	0.00	0.00
2-Class	101628	43	21302	5606	0.00	0.09
3-Class	101091	65	20574	5584	0.00	0.19
4-Class	100931	87	20225	5562	0.00	0.23
2-Factor (8,2)	101553	52	21149	5597	0.00	0.26
3-Factor (8,2,2)	100748	76	20136	5573	0.00	0.25
4-Factor (8,2,2,2)	100337	101	19510	5548	0.00	0.23
5-Factor (8,2,2,2,2)	100323	127	19271	5522	0.00	0.31
4-Factor (7,2,2,2)	100328	100	19509	5549	0.00	0.24
4-Factor (6,2,2,2)	100319	99	19509	5550	0.00	0.17
4-Factor (5,2,2,2) [a]	100271	98	19469	5551	0.00	0.28
4-Factor (4,2,2,2)	100330	97	19537	5552	0.00	0.28

Note. $n = 5{,}649$.

[a]The 4-Factor (5,2,2,2) model is determined to have the best model fit.
[b]Bayesian information criterion.
[c]Likelihood ratio chi-squared statistic.

between 46% and 52% and the rate of classification error did not exceed 19% (See Table 9). These results suggested a clear differentiation between indicators on factors and that the model yielded meaningful results. This is substantiated by the further analysis of factor level sizes and conditional partial probabilities. The factor level sizes indicated a balanced split between levels for Factor 2 and Factor 3 and an acceptable level of split for Factor 4 (See Table 10).

Results from analysis of the second sub-sample specified the four factor solution with five levels on the first factor as fitting the data best. This model was parsimonious, had low levels of classification error, and resulted in clearly distinguishable and interpretable patterns in student involvement across the three primary factors. Factor 2 differentiated between recreational and academic experiences. Factor 3 differentiated between sports and culture/arts. Factor 4

differentiated between traditional collegiate experiences (i.e., programming, leadership, student transitions, and governance groups) and many of the other group experiences (i.e., arts honors, religious, athletics, club sports, intramurals, and special interest groups). The next step in the analytic process involved comparing results between the two sub-samples.

Sub-Sample Comparison

In comparing results for the two sub-samples, the same model solution (i.e., the four factor model with five levels on the first factor) emerged with the best fit. Note the models in both sub-samples resulted in the same number of estimated parameters ($n = 98$). In general, the three primary latent factors in each sub-sample differentiated between similar indicators. However, the second sub-sample did result in some unique differences. For example, loadings for Factor 2 in the second sub-sample included the three sporting indicators with the arts indicator as primary variables for differentiating between levels. Similarly, the additional loading of leadership, student transitions, and governance groups with programming groups in Factor 4 of the second sub-sample provided more clarity in terms of differentiating between levels. These differences likely stem from the sparse nature of the data set. Variations in the patterns present in each sample do not significantly alter what defines the latent classes, but can shift results slightly (Vermunt & Magidson, 2005). Overall, results from the second sub-sample seemed to validate results from the first sub-sample. The general replication of findings suggested it would be appropriate to move forward with the four factor model solution using the full data set.

Table 9

Variable Contributions for 4-Factor (5,2,2,2) Model in Random Data Set 2

Group Experience Variables	Factor 1	Factor 2	Factor 3	Factor 4	R^2
Academic	-0.38**	-0.34**	-0.01	0.16**	0.23
Arts	-0.36**	0.18**	-0.27**	0.32**	0.14
Programming	-0.31**	0.03	-0.20**	-0.17**	0.24
Cultural	-0.38**	0.12**	-0.28**	0.16**	0.15
Honors	-0.34**	-0.56**	0.03	0.24*	0.43
Living-Learning	-0.30**	0.03	-0.15**	0.03	0.10
Leadership	-0.31**	-0.02	-0.12**	-0.27**	0.31
Media	-0.33**	0.11**	-0.12**	0.16**	0.06
Military	-0.18**	0.12**	0.02	0.15**	0.02
Student Transitions	-0.31**	-0.08	-0.08*	-0.17**	0.23
Paraprofessional	-0.25**	0.00	-0.13**	-0.11**	0.15
Political	-0.39**	0.04	-0.11**	0.19**	0.08
Religious	-0.43**	0.12**	-0.11**	0.29**	0.07
Service	-0.40**	-0.07*	-0.09**	0.12	0.12
Cultural Greeks	-0.18**	0.05	-0.04	0.05	0.03
Social Greeks	-0.38**	0.05	0.20**	0.17**	0.12
Intercollegiate Athletics	-0.29**	0.17**	0.30**	0.26**	0.14
Club Sports	-0.30**	0.20**	0.33**	0.23**	0.18
Intramurals	-0.38**	0.21**	0.43**	0.26**	0.26
Special Interest	-0.37**	0.14**	-0.14**	0.23**	0.08
Governance	-0.31**	-0.01	-0.08*	-0.19**	0.23
Standard R^2	0.67	0.46	0.52	0.52	-
Classification Error	0.28	0.19	0.16	0.14	-

Note. Group experience variable names are shortened for readability. n = 5,649.
* $p < .01$. **$p < .001$.

Table 10

Probabilities for Indicators on 4-Factor (5,2,2,2) Model with Data Set 2

	Factor 1					Factor 2		Factor 3		Factor 4	
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2
Level Size	0.52	0.01	0.26	0.14	0.07	0.57	0.43	0.50	0.50	0.67	0.33
Academic	0.33	0.51	0.68	0.81	0.90	0.38	0.75	-	-	0.63	0.39
Arts	0.07	0.13	0.24	0.39	0.57	0.23	0.08	0.07	0.28	0.25	0.05
Programming	0.04	0.08	0.15	0.27	0.44	-	-	0.05	0.18	0.07	0.17
Cultural	0.07	0.14	0.25	0.41	0.59	0.21	0.11	0.08	0.31	0.21	0.10
Honors	0.13	0.24	0.40	0.58	0.74	0.09	0.67	-	-	0.38	0.12
Living-Learning	0.03	0.05	0.11	0.20	0.34	-	-	0.04	0.11	-	-
Leadership	0.05	0.10	0.19	0.33	0.50	-	-	0.08	0.18	0.08	0.26
Media	0.04	0.08	0.15	0.27	0.44	0.13	0.06	0.07	0.14	0.13	0.05
Military	0.01	0.02	0.05	0.09	0.17	0.05	0.01	-	-	0.05	0.01
Student Transitions	0.04	0.07	0.13	0.24	0.40	-	-	0.06	0.11	0.06	0.15
Paraprofessional	0.02	0.04	0.07	0.13	0.24	-	-	0.02	0.07	0.03	0.07
Political	0.06	0.12	0.21	0.36	0.53	-	-	0.10	0.18	0.17	0.08
Religious	0.10	0.18	0.31	0.48	0.66	0.26	0.15	0.16	0.26	0.29	0.09
Service	0.05	0.10	0.19	0.33	0.50	0.10	0.15	0.09	0.15	-	-
Cultural Greeks	0.01	0.02	0.04	0.08	0.15	-	-	-	-	-	-
Social Greeks	0.07	0.13	0.24	0.40	0.58	-	-	0.25	0.09	0.20	0.09
Intercollegiate Athletics	0.03	0.07	0.13	0.24	0.39	0.13	0.04	0.21	0.03	0.14	0.02
Club Sports	0.05	0.09	0.17	0.30	0.47	0.19	0.05	0.28	0.04	0.17	0.04
Intramurals	0.29	0.45	0.63	0.78	0.88	0.61	0.34	0.73	0.26	0.61	0.26
Special Interest	0.06	0.12	0.22	0.37	0.55	0.19	0.09	0.10	0.20	0.20	0.07
Governance	0.04	0.08	0.15	0.27	0.44	-	-	0.07	0.12	0.07	0.17

Notes. Group experience variable names are shortened for readability. n = 5,649. Empty cells represent variables that were not significant ($p > .01$) contributors to the respective factor.

Full Data Set

Given the slight differences in results between sub-samples, the same analytic process detailed above was replicated on the full sample (n = 11,209) as a safety precaution. Results of model estimations revealed solutions that were nearly identical to the previous analyses (See Table 11). The four factor model with five levels in the first factor emerged as the most parsimonious, demonstrated the highest degree of goodness of fit, and appeared to be the most interpretable. Note that this model had the same number of parameters (n = 98) as in the two previous analyses. The overall rate of classification error was 28%.

Table 11

Comparison of Goodness of Fit for Models with the Full Sample

Model	BIC[b]	Parameters	L^2 [c]	*df*	*p*-value	Classification Error
1-Class	208966	21	42329	11188	0.00	0.00
2-Class	202189	43	35348	11166	0.00	0.09
3-Class	200948	65	33902	11144	0.00	0.19
4-Class	200465	87	33213	11122	0.00	0.22
2-Factor (8,2)	201859	52	34934	11157	0.00	0.22
3-Factor (8,2,2)	200215	76	33066	11133	0.00	0.25
4-Factor (8,2,2,2)	199301	101	31919	11108	0.00	0.31
5-Factor (8,2,2,2,2)	198999	127	31374	11082	0.00	0.36
4-Factor (7,2,2,2)	199212	100	31839	11109	0.00	0.29
4-Factor (6,2,2,2)	199206	99	31842	11110	0.00	0.28
4-Factor (5,2,2,2)[a]	199196	98	31841	11111	0.00	0.28
4-Factor (4,2,2,2)	199264	97	31918	11112	0.00	0.15

Note. n = 11,209.

[a]The 4-Factor (5,2,2,2) model is determined to have the best model fit.
[b]Bayesian information criterion.
[c]Likelihood ratio chi-squared statistic.

The examination of factor loadings revealed similar results to those in the two prior analyses (See Table 12). Note that the ordering of Factor 2 and Factor 3 switched from the sub-sample results, but the results were otherwise nearly identical. Factor 2 showed the highest negative loadings on the three sports variables (i.e.,

intercollegiate athletics, club sports, and intramurals) and the highest positive loadings on arts and cultural groups. Factor 3 demonstrated high negative loadings for academic and honors groups and high positive loadings for arts groups. Finally, Factor 4 resulted in high negative loadings for programming, leadership, student transition, paraprofessional, and governance groups and high positive loadings for the majority of remaining group experiences (i.e., all three sports groups, social Greek-letter, religious, academic, service, special interest, arts, and honors groups). Indicators explained between 48% and 50% of the variance, and classification error rates did not exceed 18% on any of the three primary factors.

The size of the resulting factor levels paralleled those found in sub-sample analyses with a better balance achieved for Factor 2 and Factor 3 than for Factor 4 (See Table 13). Interpreting the nature of the latent factors describing the various levels was important prior to the process of assignment of cases into latent classes to ensure consistent interpretations. This process involved examining both the loadings and probability data to determine how levels within a given factor differentiate between involvement variables. It is important to note that no single probability on a given level can be interpreted on its own. Rather, the interpretation process requires that a factor level be considered in relation to any other levels in that same factor. For example, In Factor 2, Level 1, intramurals would appear to demonstrate a relatively high probability (28%) in comparison with the other variables on that level. However, when taken in comparison with the probability for intramurals on Level 2 of the same factor (78%), it becomes clear that the overall probability is actually low.

Table 12

Variable Contributions for 4-Factor (5,2,2,2) Model with the Full Sample

Group Experience Variables	Factor 1	Factor 2	Factor 3	Factor 4	R^2
Academic	-0.38**	-0.02	-0.36**	0.22**	0.25
Arts	-0.37**	0.29**	0.24**	0.28**	0.12
Programming	-0.31**	0.11	-0.03	-0.20**	0.26
Cultural	-0.38**	0.28**	0.15**	0.10**	0.15
Honors	-0.39**	0.00	-0.44**	0.36**	0.37
Living-Learning	-0.30**	0.11**	0.04	0.03	0.09
Leadership	-0.38**	0.01	-0.10	-0.14**	0.28
Media	-0.33**	0.11**	0.15**	0.14**	0.06
Military	-0.16**	-0.02	0.13**	0.14**	0.02
Student Transitions	-0.34**	0.04	-0.11*	-0.09*	0.22
Paraprofessional	-0.26**	0.07	-0.04	-0.08*	0.13
Political	-0.39**	0.11**	0.08**	0.16**	0.08
Religious	-0.44**	0.13**	0.15**	0.30**	0.07
Service	-0.42**	0.06	-0.05*	0.19**	0.10
Cultural Greeks	-0.18**	0.05*	0.06*	0.02	0.03
Social Greeks	-0.40**	-0.19**	0.06*	0.24**	0.11
Intercollegiate Athletics	-0.27**	-0.25**	0.17**	0.28**	0.12
Club Sports	-0.30**	-0.34**	0.15**	0.23**	0.19
Intramurals	-0.38**	-0.47**	0.15**	0.31**	0.30
Special Interest	-0.38**	0.11**	0.15**	0.18**	0.07
Governance	-0.34**	0.00	-0.07	-0.14**	0.23
Standard R^2	0.67	0.48	0.50	0.50	-
Classification Error	0.28	0.18	0.17	0.15	-

Note. Group experience variable names are shortened for readability. n = 11,209.
* $p < .01$. **$p < .001$.

Table 13

Probabilities for Indicators on 4-Factor (5,2,2,2) Model with Full Sample

	Factor 1					Factor 2		Factor 3		Factor 4	
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2
Level Size	0.51	0.01	0.26	0.14	0.08	0.57	0.43	0.57	0.43	0.69	0.31
Academic	0.32	0.50	0.68	0.82	0.91	-	-	0.38	0.76	0.66	0.31
Arts	0.07	0.14	0.25	0.42	0.61	0.29	0.07	0.26	0.08	0.25	0.06
Programming	0.04	0.08	0.15	0.28	0.45	-	-	-	-	0.07	0.17
Cultural	0.07	0.14	0.25	0.42	0.61	0.29	0.07	0.22	0.10	0.19	0.11
Honors	0.14	0.26	0.43	0.62	0.78	-	-	0.15	0.60	0.46	0.09
Living-Learning	0.03	0.06	0.11	0.21	0.37	0.10	0.04	-	-	-	-
Leadership	0.06	0.11	0.21	0.36	0.55	-	-	-	-	0.10	0.22
Media	0.04	0.08	0.17	0.30	0.48	0.13	0.07	0.15	0.06	0.14	0.05
Military	0.01	0.02	0.04	0.09	0.17	-	-	0.05	0.01	0.05	0.01
Student Transitions	0.03	0.07	0.14	0.26	0.43	-	-	0.06	0.14	0.07	0.13
Paraprofessional	0.02	0.03	0.07	0.14	0.26	-	-	-	-	0.04	0.06
Political	0.05	0.11	0.21	0.36	0.55	0.17	0.09	0.16	0.10	0.17	0.07
Religious	0.09	0.17	0.31	0.49	0.67	0.26	0.15	0.27	0.14	0.30	0.08
Service	0.05	0.10	0.20	0.35	0.53	-	-	0.11	0.15	0.16	0.07
Cultural Greeks	0.01	0.02	0.04	0.08	0.15	0.03	0.02	0.03	0.01	-	-
Social Greeks	0.07	0.13	0.25	0.41	0.60	0.11	0.26	0.18	0.13	0.23	0.07
Intercollegiate Athletics	0.03	0.07	0.14	0.26	0.43	0.04	0.20	0.15	0.04	0.16	0.02
Club Sports	0.05	0.09	0.18	0.32	0.50	0.05	0.29	0.17	0.06	0.18	0.03
Intramurals	0.28	0.45	0.64	0.79	0.89	0.28	0.78	0.59	0.38	0.64	0.22
Special Interest	0.06	0.12	0.23	0.39	0.58	0.19	0.11	0.21	0.09	0.20	0.07
Governance	0.04	0.08	0.15	0.28	0.45	-	-	-	-	0.07	0.15

Notes. Group experience variable names are shortened for readability. n = 11,209. Empty cells represent variables that were not significant ($p > .01$) contributors to the respective factor.

Factor 2, Level 1 demonstrated a higher probability for involvement patterns related to groups focused on identity and expression (i.e., arts, theater, music, cultural, and international groups) than sports (i.e., intercollegiate athletics, club sports, and intramurals), while Factor 2, Level 2 reflected the opposite. Factor 3, Level 1 indicated a higher probability for patterns of involvement associated with the arts than academic careers (i.e., academic, departmental, and professional organizations as well as honor societies), while Factor 3, Level 2 was the opposite. Finally, Factor 4, Level 2 captured a higher probability for patterns involving highly-visible, traditional collegiate activities (i.e., campus-wide programming boards, leadership groups, new student transitions, paraprofessional groups, and governance organizations) than more diffuse patterns of involvement (i.e., no dominant group probability), while Factor 4, Level 1 was the opposite.

The next step in the analytical process explored resultant latent classes emerging from the model. Modal probabilities were generated for each unique pattern of response and then cases assigned to the specific latent class that represented one of the eight variations derived from crossing levels from the three primary factors. Table 14 provides descriptive information regarding the classes along with probabilities for each indicator by class. Table 15 is an extension of table 14 adding naming conventions for each of the latent classes and factor levels. It also distills the indicator probabilities to reflect just those group experiences represented in the pattern of involvement describing the latent class.

Table 14

Probabilities and Descriptors of Latent Classes with Full Sample

	1	2	3	4	5	6	7	8
Factor 2	Level 1	Level 1	Level 1	Level 1	Level 2	Level 2	Level 2	Level 2
Factor 3	Level 1	Level 1	Level 2	Level 2	Level 1	Level 1	Level 2	Level 2
Factor 4	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2
Size	0.19	0.09	0.24	0.05	0.21	0.11	0.08	0.03
n	2,186	973	2,747	540	2,319	1,200	956	288
Academic	0.22	0.37	0.81	0.85	0.31	0.44	0.88	0.88
Arts	0.40	0.40	0.19	0.27	0.05	0.12	0.04	0.04
Programming	0.03	0.52	0.09	0.69	0.01	0.35	0.06	0.57
Cultural	0.26	0.60	0.20	0.45	0.03	0.20	0.05	0.13
Honors	0.07	0.03	0.75	0.66	0.07	0.05	0.96	0.79
Living-Learning	0.06	0.25	0.08	0.32	0.02	0.15	0.05	0.17
Leadership	0.03	0.44	0.13	0.78	0.03	0.5	0.21	0.82
Media	0.14	0.28	0.09	0.17	0.07	0.18	0.06	0.12
Military	0.04	0.04	0.01	0.02	0.05	0.06	0.02	0.01
Student Transitions	0.02	0.28	0.11	0.63	0.01	0.28	0.14	0.65
Paraprofessional	0.02	0.19	0.05	0.42	0.01	0.16	0.04	0.30
Political	0.14	0.30	0.14	0.29	0.07	0.21	0.12	0.22
Religious	0.27	0.35	0.22	0.29	0.14	0.22	0.18	0.21
Service	0.08	0.19	0.20	0.37	0.05	0.18	0.20	0.39
Cultural Greeks	0.02	0.10	0.02	0.08	0.01	0.07	0.02	0.06
Social Greeks	0.11	0.14	0.11	0.14	0.19	0.41	0.32	0.49
Intercollegiate Athletics	0.04	0.04	0.03	0.02	0.29	0.28	0.23	0.14
Club Sports	0.02	0.06	0.03	0.02	0.35	0.47	0.33	0.33
Intramurals	0.21	0.33	0.17	0.22	0.86	0.91	0.93	0.91
Special Interest	0.19	0.32	0.13	0.25	0.11	0.23	0.10	0.21
Governance	0.02	0.34	0.08	0.63	0.02	0.41	0.14	0.70
Mean Range[a]	2	6	4	8	3	6	5	8

[a]Refers to the covariate designed to measure the total number of types of group experiences reported by participants.

Table 15

Emergent Classes, Factor Interactions, and Probable Group Experiences

	Affinity Group Affiliates	**Identity & Expression Leaders**	**Academic Careerists**	**Cultural Collegiates**
Factor 1	Identity & Expression	Identity & Expression	Identity & Expression	Identity & Expression
Factor 2	Arts	Arts	Academic Careers	Academic Careers
Factor 3	Diffuse	Collegiate	Diffuse	Collegiate
Mean Breadth	2	6	4	8
Highest Probabilities	Arts (40) Religious (27) Cultural (26)	Cultural (60) Programming (52) Leadership (44) Arts (40)	Academic (81) Honors (75)	Academic (85) Leadership (78) Programming (69) Honors (66) Student Transitions (63) Governance (63) Cultural (44)
	Athletes	**Social Recreators**	**Recreational Academics**	**Social Collegiates**
Factor 1	Sports	Sports	Sports	Sports
Factor 2	Arts	Arts	Academic Careers	Academic Careers
Factor 3	Diffuse	Collegiate	Diffuse	Collegiate
Mean Breadth	3	6	5	8
Highest Probabilities	Intramurals (86) Club Sports (35) Academics (31) Intercollegiate Athletics (29)	Intramurals (91) Club Sports (47) Academics (44) Social Greeks (41)	Honors (96) Intramurals (93) Academic (88)	Intramurals (91) Academic (88) Leadership (82) Honors (79)

	Governance (41) Programming (35)	Governance (70) Student Transitions (65) Programming (57) Social Greeks (49)

Note. Numbers in parentheses represent the probability a given indicator is found in a latent class. Breadth represents the number of types of group experiences an individual experienced.

Affinity Group Affiliates

Class 1 represented underlying involvement patterns associated with higher probabilities for identity and expression, arts, and diffuse patterns of involvement. It was among the largest classes (19%; n = 2,186), although members of the subgroup reported involvement in the fewest types of group experiences (m = 2). Indicators in this class with the highest probability were arts (40%), religious (27%), and cultural (26%). As such, the class was labeled Affinity Group Affiliates to reflect the focus on identity-based groups and the expressive arts.

Identity and Expression Leaders

The second class was influenced by the following factor interactions: identity and expression, arts, and traditional collegiate. Members of this latent class reported an average of six types of group experiences and represented 9% of the overall sample. Indicators with the highest probability in this class included: cultural (60%), programming (52%), leadership (44%), and arts (40%). This cluster was labeled Identity and Expression Leaders, which reflected the combination of community-directed involvement (i.e., programming and leadership) with aesthetic arts and identity group experiences.

Academic Careerists

The third class was the largest (24%; n =2,747) with members reporting an average involvement in four types of group experiences. Probabilities suggested patterns of involvement associated with arts and cultural groups, academic careers, and more diffuse experiences. This was evident in indicator probabilities, which were highest for academic and honors groups and diffused across all other experiences at a relatively low rate. Thus, this class was labeled Academic Careerists.

Cultural Collegiates

The fourth class was amongst the smallest in the sample (5%), but members reported one of the highest ranges of group experiences (m = 8). Factor interactions resulted in patterns emphasizing arts and culture, academics and honors, and the traditional collegiate. A large number of indicators demonstrated high probabilities for this class and included: leadership (78%), programming (69%), honors (66%), student transitions (63%), governance (63%), and cultural (44%). The label assigned to this class was Cultural Collegiates, which reflected the breadth of involvement represented in this pattern, emphasis on cultural experiences, and experiences with high visibility and a campus-wide influence.

Athletes

The fifth class represented 21% of the sample (n = 2,319) with members averaging involvement in three group experiences. Patterns of involvement derived from factors specified higher probabilities for patterns involving sports, arts, and diffuse group experiences. Among the most likely group experiences were intramurals (86%), club sports (35%), academics (31%), and varsity sports (29%).

Involvement across other variables was diffuse. This class was identified as Athletes given the emphasis on sports and the rather diffuse range of involvement across other activities.

Social Recreators

The sixth class represented 11% of the total sample and averaged involvement in six group experiences. Patterns across factors reflected emphases on sports, arts, and traditional collegiate group experiences. The highest probabilities among indicators included: intramurals (91%), club sports (47%), academics (44%), governance (41%), social Greek-letter groups (41%), and programming (35%). This class was labeled Social Recreators to reflect the combination of sports and social organizations.

Recreational Academics

Members of the seventh class were involved with approximately five types of organizations and comprised 8% (n = 956) of the total sample. Involvement reflected latent patterns associated with sports, academic careers, and a diffuse set of experiences. This was apparent in the examination of indicator probabilities, which were highest for honors (96%), intramurals (93%), and academics (88%). Probabilities across other indicators were low and scattered. This class was labeled Recreational Academics to capture the combination of academic and recreation activities that typically partnered with a random set of other group experiences.

Social Collegiates

The final class was the smallest, representing only 3% of the overall sample. Similar to the fourth class (i.e., Cultural Collegiates), members of this class had a

wide range of group experiences averaging about eight per person. Latent factor patterns associated with this class were sports, academic careers, and traditional collegiate group experiences. A wide array of indicators demonstrated high probabilities including: intramurals (91%), academics (88%), leadership (82%), honors (79%), governance (70%), student transitions (65%), programming (57%), and social Greek-letter groups (49%). This class was labeled Social Collegiates to capture the breadth of experiences and social nature of many of the groups.

The first research question explored whether or not latent phenomena could be identified that assisted in the classification of students into subgroups based on their patterns of involvement across 21 types of co-curricular group experiences. The stated hypothesis suggested that at least one latent dimension would be identified and associated with the breath, or number of types of group experiences, of involvement during college. Results indicated this was accurate. Three additional latent factors were identified as well. Moreover, the interaction among latent factors was successfully used to classify students into a total of eight latent classes.

Research Question 2

The second research question examined whether classes of the emergent taxonomy representing patterns of student involvement discriminated against one another when examined in relationship to a theoretically-derived measure of leadership development. Prior to the analysis, a total of 62 cases with missing data were removed. Additionally, sample sizes were balanced to avoid a violation of homogeneity of variance (Tabachnick & Fidell, 2007). This was done by using the full sample from the Social Collegiates class and drawing random samples to match

this number (n = 285) for each of the other classes. A one-way, between-groups analysis of variance (ANOVA) was conducted with latent class membership as the independent variable and the Omnibus SRLS as the dependent variable. Statistically significant mean differences were identified across class memberships [F(7, 2,272) = 12.21, p < .05, d = .4] with a small to moderate effect size (See Table 16). Post-hoc comparisons were conducted using a Bonferroni adjusted value of .01 to control for Type I error (Hair et al., 1998; Tabachnick & Fidell). Significant mean differences were found between several classes with results indicating a clear discrimination between subgroups on the dependent measure. Significant differences were identified between Cultural Collegiates and Affinity Group Affiliates [t(568) = 6.19, p < .01, d = .5], Academic Careerists [t(568) = 4.49, p < .01, d = .4], Athletes [t(568) = 7.61, p < .01, d = .6], and Recreational Academics [t(568) = 4.77, p < .01, d = .4]. Additional differences were identified between Social Collegiates and Affinity Group Affiliates [t(568) = 5.02, p < .01, d = .4], Athletes [t(568) = 6.30, p < .01, d = .6], and Recreational Academics [t(568) = 3.60, p < .01, d = .3]. Finally, significant differences were found between Athletes and both Identity and Expression Leaders [t(568) = 3.76, p < .01, d = .3] and Social Recreators [t(568) = 3.87, p < .01, d = .3]. The classes with a higher probability for involvement in traditional collegiate patterns all scored significantly higher than other classes.

Table 16

ANOVA table with post hoc comparisons for Latent Classes on Omnibus SRLS

Latent Class	N	Mean	*SD*	*F*	*P*	*d*	Tukey's post hoc
1. Affinity Group Affiliate	285	3.96	.40				
2. Identity and Expression Leader	285	4.05	.40				
3. Academic Careerist	285	4.02	.36				
4. Cultural Collegiate	285	4.15	.33				
5. Athlete	285	3.93	.36				
6. Social Recreator	285	4.05	.38				
7. Recreational Academics	285	4.01	.37				
8. Social Collegiate	285	4.12	.36				
	2,280	4.04	.38	12.21	.000	.40	4 > 3 4, 8 > 1,7 5 < 2, 4, 6, 8

Notes. Omnibus SRLS is measured on a 5-point Likert scale.

The hypothesis associated with the second research question stated that meaningful differences would be identified based on latent class membership when examined in relationship to a theoretical measure of leadership. Results confirmed the hypothesis. Class membership was associated with differential scores on the outcome measure with different classes demonstrating varying magnitudes of significance and/ or effect.

Research Question 3

Question three examined whether or not there were significant relationships between latent class membership and the demographic variables of race and gender. For the analysis of race, cases in which the respondent identified as Native American (n = 29) were treated as missing to avoid violating the chi-square test of independence assumption of at least five cases per cell. The racial categories used in the analysis, then, were African American/ Black, Asian American, Latino, Multiracial, and White. Results revealed significant differences between participant race and class

membership [$\chi^2(28) = 726.81$, $p < .001$] (See Table 17). Cramer's V is a measure of association (i.e., an approximation of effect size) traditionally used with chi-square tests of independence in which there are more than two categories (Field, 2005). In this analysis, Cramer's V was significant ($p < .001$) and the value was .13, indicating a significant, but small magnitude of relationship between racial groups and class membership (Field). The examination of observed versus expected cases across dimensions revealed that students of color were routinely over-represented in the Affinity Group Affiliates and Identity and Expression Leaders classes, which were associated with patterns of involvement with a higher probability for cultural and international group experiences. Students of color were proportionally under-represented in Athletes and Recreational Academics, groups for which the latent patterns favored involvement that combined sports and a more diffuse set of group experiences. The opposite was true for White students. Additionally, African American/ Black students were proportionally over-represented as Cultural Collegiates.

Table 17

Prevalence (%) of students by race in each latent class

Latent Class	White	African American/ Black	Asian American	Latino	Multiracial
Affinity Group Affiliate	68	6	11	5	10
Identity and Expression Leader	53	13	12	7	14
Academic Careerist	77	4	8	3	7
Cultural Collegiate	66	11	8	4	11
Athlete	84	2	4	3	7
Social Recreator	78	3	6	4	9
Recreational Academics	92	1	2	1	4
Social Collegiate	87	0	5	2	6

Note. $\chi^2(28) = 726.81$, $p < .001$

A significant relationship was also found between gender and class membership [$\chi^2(7) = 595.59$, $p < .001$] (See Table 18). Cramer's V was again significant ($p < .001$) and the value was .23 indicating a significant and moderate magnitude of relationship between gender and class membership. The expected versus observed counts suggested men were proportionally over-represented and women under-represented in three of the four classes associated with patterns involving high probabilities for sports (i.e., Athletes, Social Recreators, and Recreational Academics). Conversely, women were over-represented and men under-represented across all other class memberships.

Table 18

Prevalence (%) of students by gender in each latent class

Latent Class	Women	Men
Affinity Group Affiliate	65	35
Identity and Expression Leader	68	32
Academic Careerist	72	28
Cultural Collegiate	73	27
Athlete	43	57
Social Recreator	50	50
Recreational Academics	54	46
Social Collegiate	63	37

Note. $\chi^2(7) = 595.59$, $p < .001$

The hypothesis for the third research question suggested that there would be a significant relationship between class membership and demographic variables. Results from the study confirmed an overall relationship with both race and gender. Furthermore, representation between categories of the demographic variables demonstrated proportional over-representation and under-representation with specific classes.

Summary

This chapter provided an overview of the results associated with each of the research questions explored in this study. Results established the presence of four latent factors underlying patterns of student involvement in co-curricular group experiences. Interactions across three of these factors contributed to the classification of students into eight latent classes describing patterns of group involvement characterized by high degrees of peer contact. Tests designed to determine whether or not classes truly discriminated between students were conducted as well. Emergent classes differed in their influence on a theoretically-derived measure of leadership and demonstrated significant relationships with the key demographic variables of race and gender. The next chapter examines these findings more closely and provides suggested implications, limitations, and areas for future research.

CHAPTER FIVE: DISCUSSION

This chapter provides a review of the central problem as well as study design and methodology. The chapter then presents a discussion of the findings including interpretations connected to existing theory and research. Implications are offered as well as descriptions of limitations and recommended areas for future research. The chapter ends with a brief summary of this research.

Statement of Problem

Literature and research on co-curricular group involvement experiences often suggest a direct relationship with gains in traditional college student outcomes (Pascarella & Terenzini, 2005). However, research on this topic is often polarized in its design. Some researchers (e.g., Magolda & Ebben, 2006; McLure, 2006; Pike, 2003) report the unique benefits of a specific type of involvement (e.g., social fraternities, service organizations, residence hall councils) without accounting for how concurrent experiences contribute to learning as well. Although this research is important, particularly in the development of a better understanding of traditionally under-studied populations, it has the potential to overestimate the influence of the student group experience as well as present non-applicable findings should schools not have similar group experiences on their campuses. Other researchers report findings for involvement in co-curricular group experiences broadly (e.g., Flowers, 2004; Foubert & Grainger, 2006; Lundberg et al., 2007), which limits the ability of practitioners to target interventions given the absence of parameters defining what is meant by the term. Finally, some researchers take a more scattershot approach to studying involvement by selecting a seemingly random set of group experiences

(Dugan, 2006b; Kezar & Moriarty, 2000; Thompson, 2006). These sets of experiences are often constructed in relation to the researcher's central hypotheses, as an attempt to capture breadth of involvement, or using knowledge of the student sample prior to the investigation. However, the approach still fails to accurately capture the full range of patterns of involvement and can contribute to confounded results in which overall effects as well as unique contributions remain unclear. Given the above, the reduction of student patterns of involvement across co-curricular group experiences into a thematic taxonomy could provide a valuable middle ground for use in both research and practice. This framework could then be applied in college impact research design models to better understand the influence of patterns of student group experiences on educational outcomes such as leadership development.

The purpose of this study was to explore whether latent phenomena could be identified to assist in the classification of students into subgroups based on their patterns of involvement across 21 types of co-curricular group experiences (e.g., political groups, student governance, club sports). Further analyses attempted to establish whether or not the emergent subgroups truly discriminated among students. The study served as a direct response to Kuh's (1995) call for an increase in research on student cultures and the link between behaviors and characteristics associated with these cultures and educational outcomes. Furthermore, the study afforded an opportunity to examine the traditional student typology category of collegiate in more significant depth (Astin, 1993a; Clark & Trow, 1966; Kuh et al., 2000). The specific research questions informing this study included the following:

1) Do underlying, latent dimensions differentiate between patterns of student involvement across 21 types of co-curricular group experiences and can they be used for classification of students into subgroups?
2) Are there significant differences between subgroups on a theoretical measure of leadership development?
3) Are there significant relationships between key demographic characteristics (i.e., race and gender) and student subgroups?

Review of Methods

This quantitative study employed a cross-sectional, causal comparative design using data from the Multi-Institutional Study of Leadership (MSL). The purpose of the MSL was enhance knowledge regarding contemporary college student leadership development as well as the influence of higher education as a context in which building leadership capacity occurs (Dugan et al., 2006). The sample was comprised of multiple institutions of higher education in the United States. Purposeful sampling techniques were used to select a pool of institutions that best represented the vast diversity of institutional types in the U.S. higher education system. Participant samples were drawn according to study parameters from each of the participating schools as detailed in Chapter 3. The total sample size for the MSL was 155,716 cases of which 56,854 submitted usable surveys. The resultant return rate of 37% exceeded the standard rate achieved in web-based survey research (Couper, 2000; Crawford et al., 2001). Data were cleaned and reduced according to study parameters to include only seniors to ensure enough time within the collegiate environment to

experience the wide array of co-curricular group experiences. The final sample for this study was comprised of 11,209 cases representing 50 colleges and universities.

The MSL survey instrument consisted of new and pre-existing scales compiled specifically for use in the national study. The primary research question for this study relied upon 21 dichotomous variables used to determine participant involvement in co-curricular group experiences (e.g., academic groups, social fraternities and sororities, student governance, paraprofessional roles). Latent class analysis, a technique similar to cluster analysis, but more appropriate for use with dichotomous data representing unobservable or latent phenomena, was selected as the analytic technique (Dayton, 1998). Latent class analysis identifies subtypes, or categories, of mutually exclusive and exhaustive latent classes in multivariate, categorical data (McCutcheon, 1987). As an analytic technique, latent class analysis was well suited for this exploratory study given its ability to integrate analytic techniques that are analogues to both factor analysis and cluster analysis (Magidson & Vermunt, 2001, 2004). The second two research questions in this study used one-way analysis of variance and chi-squared tests of independence to examine the extent to which emergent latent classes discriminated between one another when describing student leadership outcomes and demographics.

Summary of Results

The primary research question considered whether there were latent dimensions to students' involvement patterns in co-curricular group experiences and if those patterns would be useful in identifying and classifying students into subgroups. Results verified the presence of four latent factors, three of which

contributed to student classification into latent classes. The first latent factor reflected the degree of breadth (i.e., the number of different types of group experiences) in student involvement, but was not used to classify students given the extent to which it masked the presence of other factors. The use of an inactive covariate allowed for this data to still be represented in the overall findings, although the factor itself was partialed out of the analysis. The first of the three primary factors differentiated between higher probabilities for patterns of involvement focused on identity and expression (i.e., arts, theater, music, cultural, and international group experiences) as opposed to sports (i.e., intercollegiate athletics, club sports, and intramurals). The second latent factor distinguished between higher probabilities for patterns involving arts (i.e., arts, theater, and music) versus academic careers (i.e., academic, departmental, and professional groups as well as honors societies). The third latent factor differentiated between patterns of involvement related to highly visible traditional collegiates (i.e., campus-wide programming, leadership, new student transition, and governance groups) and a more diffuse pattern (i.e., involvement in limited or an unrelated group of experiences).

Interactions across the three primary latent factors contributed to complex patterns representing student involvement in group experiences. These interactions were used to classify students into eight discrete latent classes each representing a set of involvement patterns from the more than 5,200 present in the data. The latent classes were interpreted based on factor influences and group experience probabilities and labeled as follows: Affinity Group Affiliates, Identity and Expression Leaders, Academic Careerists, Cultural Collegiates, Athletes, Social Recreators, Recreational

Academics, and Social Collegiates. Table 15 in Chapter 4 provides an overview of the latent classes, associated factor patterns, and group experiences with the highest probabilities.

The secondary research questions examined the extent to which categories of the emergent latent class taxonomy discriminated against one another as a means of furthering validity. Latent class membership contributed to significant mean differences on a measure of socially responsible leadership. Significant relationships were also identified between latent classes and the demographic variables of race and gender.

Discussion

This section provides a detailed analysis of findings from the study in the context of existing literature. This begins by interpreting the emergent taxonomy as a whole in relation to extant knowledge. A more detailed discussion is then provided that explores latent factors and classes, situating each in the literature. This is followed by an interpretation of the secondary questions and implications of findings for both research and practice in student affairs and higher education. The section then gives attention to limitations of the study and provides recommendations for future research.

Interpretation and Relationship to Previous Research

Results of this study confirmed the presence of both latent factors influencing patterns of student involvement and a taxonomy of latent classes describing student subgroups based on those patterns. The identification of this taxonomy builds upon existing theory relating to student involvement as well as previously identified

taxonomies. This extension of theory is visible in a number of unique ways including the focus on peer interactions, examination of patterns amongst behavioral variables, and refinement of the category of students typically referred to as collegiates.

First, existing taxonomies of student subcultures (e.g., Astin, 1993a; Clark & Trow, 1966; Kuh et al., 2000) relied largely on variables describing student perceptions or interactions within the college environment covering a broad spectrum of student experiences (e.g., using a study lounge, writing a research paper, participating in a student organization, expectations for election to positional leadership roles, perceived artistic talent). Although important, neither of these is fundamentally predicated on high degrees of student interaction. In fact, many variables were associated with tasks accomplished in isolation. This is despite theorists' identification of the peer reference group as the single greatest influence on college student values and outcomes (Astin, 1996; Newcomb, 1962; Weidman, 1989). Newcomb suggested that:

> In so far as we are interested in what college experience does to students' attitudes we must, because of the nature of attitude formation and change, be interested in the groups to which students (wittingly or not) yield power over their own attitudes. Most attitudes- and particularly those in which educators are interested- are, as social psychologists like to say, anchored in group membership. (p. 479)

The theoretical assertion of the primacy of peer groups to student learning is corroborated by the vast amounts of empirical research that have explored the topic (Astin, 1991, 1993b, 1996; Pascarella & Terenzini, 1991, 2005). Nevertheless,

existing taxonomies continue to rely heavily on variables unrelated or indirectly related to peer interactions. The emergent taxonomy from this study, however, benefits from the use of variables that were directly linked to participation in peer groups associated with high degrees of peer interaction.

Second, in addition to the reliance on variables that may not capture peer interaction, many of the existing taxonomies failed to measure actual behavior. For example, Astin's (1993a) taxonomy utilized a combination of students' attitudes and intended behaviors and/ or goals for college. The study presented here benefits from the use of measures of actual student behavior and so is more closely related to Kuh et al.'s (2000) taxonomy. Furthermore, existing research on student involvement rarely takes into account patterns of involvement, which often times confounds results (Gellin, 2003; Foubert & Grainger, 2006; Hernandez et al., 1999; Hoffman, 2002; Moore et al., 1998; Renn & Bilodeau, 2005a). The examination of involvement in group experiences in this study used a more complex analytic method that allowed for an examination of underlying latent dimensions shaping patterns of involvement behavior rather than associating individual variables with a single factor or class. The use of patterns of behavior increased the number of variables used for classification into subgroups exponentially from the finite number of predictor variables (e.g., in this case 21) to the much larger number of varying involvement patterns (e.g., in this case 5,208). Thus, the study expanded upon existing taxonomies by adding to the complexity with which the subgroups are generated and responding to the call for an examination of involvement behaviors that accounts for patterns across different types of student group experiences.

Third, almost all existing taxonomies recognize a subgroup of students typically described as collegiates or a variation on the term (Astin, 1993a; Clark & Trow, 1966; Horowitz, 1965; Kuh et al., 2000; Tabor & Hackman, 1976). This group is characterized by student involvement in clubs and organizations and peer interactions, and in Kuh et al.'s study accounted for almost a third of the student sample. However, despite the large size of this group and the wide array of experiences and content areas that comprise co-curricular group experiences, little has been done to refine knowledge regarding students in this category. Are we to assume that all students involved in clubs and organizations are alike and experience the college environment in similar ways? A central function of this study was to examine the collegiate category more closely to determine if students reporting involvement in co-curricular group experiences could be further divided based on where they directed their involvement behaviors. Results from the study suggest that students typically classified as collegiates do differ in meaningful ways. Additionally, the combination of macro-level (e.g., involvement in student clubs and organizations in general) and micro-level (e.g., involvement in group athletics, induction into honors societies, participation in community service groups) approaches to measurement of student involvement in most typologies confounds results creating artificial differentiations in which a student either is a collegiate and participates in clubs and organizations or is categorized into another group associated with arts, sports, social activism, or some other arena of the college environment. However, are these micro-level variables not co-curricular group experiences as well? Do they really exclude the student from identification as a collegiate? The assumption made in prior

taxonomies that the collegiate category is somewhat divorced from more academic, artistic, or athletic subcultures would appear to be false based on results from this study. The emergent taxonomy presented here identified latent classes characterized by group experience patterns associated with these other arenas of the college environment.

In addition to exploring connections between existing literature and the overall taxonomy, the emergent latent factors and classes are worthy of discussion. However, interpretations of this in the context of existing knowledge are a bit more challenging given the near total absence of research on latent patterns of student involvement (Gellin, 2003; Foubert & Grainger, 2006; Hernandez et al., 1999; Hoffman, 2002; Moore et al., 1998; Renn & Bilodeau, 2005a). The sections that follow elaborate on factors and classes and attempt to connect the content in meaningful ways to existing knowledge particularly as it relates to categories of previously identified taxonomies.

Latent Factors

A total of four latent factors were identified that differentiated between student involvement patterns across 21 types of co-curricular group experiences. Factor 1, which represented breadth of involvement, was not used to classify students into subgroups and was segmented out of the analysis given the degree to which it masked the ability to identify other latent variables. However, the study was still able to approximate the effect of this factor via a covariate designed to measure involvement breadth, or the number of different types of student group experiences. The covariate differentiated between the classes that eventually emerged from the

other three factors and seemed to reflect small, moderate, and large breadths. The small breadth classes were involved in an average of two to four group experiences. Affinity Group Affiliates, Athletes, and Academic Careerists all fell in this range. The moderate group reflected involvement in five or six experiences and included Recreational Academics, Social Recreators, and Identity and Expression Leaders. The large breadth groups averaged participation in eight experiences and included the Social Collegiates and Cultural Collegiates.

Factor 2 differentiated between identity and expression patterns (i.e., arts, theater, music, cultural, and international groups) and sports-related patterns (i.e., intercollegiate athletics, club sports, and intramurals). Factor 3 distinguished between arts (i.e., arts, theater, and music groups) and academic careers (i.e., academic, departmental, and professional groups as well as honor societies). Factor 4 demonstrated perhaps the most interesting contrasts in patterns of involvement, which related to highly visible, traditional collegiate experiences (i.e., campus-wide programming, leadership, new student transitions, paraprofessional roles, and governance groups) versus a more diffuse pattern (i.e., relatively equally distributed probabilities for involvement across all other group experiences pointing to a random set of experiences). This last latent pattern was referred to as traditional collegiate given it reflected group experiences associated with higher degrees of influence, engagement, and investment in the campus community as well as potentially higher degrees of contact with student affairs administrators (Kuh et al., 2000). This is consistent with how Clark and Trow (1966) and subsequent theorists described the

category of students they labeled collegiates. In this taxonomy it represented a pattern of involvement that could be used to differentiate between classes.

Affinity Group Affiliates

The latent class labeled Affinity Group Affiliates reflected the interaction of patterns associated with identity and expression, arts, and diffuse sets of involvement. The indicator variables with the highest probabilities included arts, cultural, and religious groups. Students in this category were involved in only a limited number of group experiences ($m = 2$) suggesting that when they were involved, it likely reflected the above groups. This class was among the largest with 19% of students being classified as members. An examination of relationships with race and gender revealed that students of color and women were over-represented in this group in comparison with men and White students.

Cultural and religious groups are often associated with salient aspects of an individual's social identity and typically serve as an opportunity for self-expression in a safe community of like peers (Guiffrida, 2003; Harper & Quaye, 2007; Padilla, Trevino, Gonzalez, & Trevino, 1997). Cultural organizations in particular serve an important role on predominantly White campuses as a source for social support and comfort in an environment that might be relatively foreign or hostile (Guiffrida). To some degree, students involved in artistic groups may develop a similar sense of identity based on their affinity for creative activity and peer group norm sharing (Barber, Stone, Hunt, & Eccles, 2005). Given this, one might infer that this latent class is populated by students demonstrating a higher degree of awareness of their social identity particularly as it relates to the broader campus community.

Furthermore, students in this class had low probabilities for involvement in group experiences involving campus-wide efforts, an important distinction with other classes in this taxonomy. It could be that this class represents a starting point from which students learn the skills and coping techniques necessary for success in an environment in which the cultural, racial, religious, or social norms differ from their own social identity. As such, the latent class is labeled Affinity Group Affiliates given the small degree of breath and extent to which group experiences in this category potentially represent identity-based affinities. Kuh et al. (2000) identified a category of student they labeled the artist, which also reflected high degrees of involvement in art, theater, and music experiences. However, their category did not incorporate cultural group experiences in any way.

Identity and Expression Leaders

The interaction of latent factors associated with identity and expression, arts, and the traditional collegiate contributed to the latent class labeled Identity and Expression Leaders. This class greatly resembled the Affinity Group Affiliates and is distinguished largely by the inclusion of patterns associated with the traditional collegiate. Co-curricular group experiences with the highest probability for this class included arts, campus-wide programming, cultural, and leadership experiences. This class represented about 9% of the student sample and members were involved in an average of six different types of group experiences. Similar to the previously described class, women and students of color were over-represented in comparison with their male and White peers.

It is interesting that of the group experiences associated with the traditional collegiate pattern, the two with the highest probability for this class were campus-wide programming and leadership. What is not know is whether members of this class were involved in leadership and campus-wide programming as a means to advance their individual affinity groups or as a completely separate endeavor. Often, identity-based organizations serve as training grounds or cultural enclaves through which students develop the self-efficacy and social linkages to eventually progress into more campus-wide venues (Harper & Quaye, 2007; Murguia, Padilla, & Pavel, 1991; Sutton & Terrell, 1997). Similarly, research suggests that as students become more comfortable with their racial identity the group experience begins to be seen as an outlet or platform for educating and sensitizing others on campus regarding their respective population (Guiffrida, 2003; Harper & Quaye; McLure, 2006). It could be that this class represents an extension of the first latent class (i.e., Affinity Group Affiliates), but with members taking on more active roles within the group experiences. Existing taxonomies offer little help in understanding the nature of this class as no previous work has identified a unique pattern of involvement related heavily to cultural group experiences. In fact, few other taxonomies even incorporated variables related to cultural forms of involvement.

Academic Careerists

The latent class labeled Academic Careerists was the result of an interaction between latent factors associated with patterns of involvement in identity and expression, academic careers, and diffused sets of experiences. Co-curricular group experiences associated with involvement in academic, departmental, and professional

groups as well as honor societies demonstrated exceptionally high probabilities (i.e., 75% to 81%) for inclusion in this class, overshadowing all other group experiences. This class represented the largest percentage of the population (24%) with members typically involved in about four different types of organizations. Women were typically over-represented in this class, but racial groups were distributed equally.

The class derived its name from the intense focus on disciplinary, academic, and career-driven group experiences. The class is similar to the category of student Astin (1993a) defined as Scholars given both emphasize participation in honors societies, although his definition is principally derived using variables associated with perceived academic aptitudes. That this class is the largest may be a reflection of the largely traditionally-aged sample and generational influences that flow from the millennial classification. The millennial generation is characterized by both an achievement orientation and high needs for recognition (Howe & Strauss, 2000). The types of involvement experiences reflected in this pattern are associated with academic recognition useful for later career or educational advancement and would probably appeal to millennials.

Cultural and Social Collegiates

Cultural and Social Collegiates represented two latent classes derived from the interactions between latent factors associated with patterns of involvement in academic careers and traditional collegiate involvement. They differ only on the third factor, which involved identity and expression for Cultural Collegiates and sports for Social Collegiates. Each of the classes is small comprising 5% or less of the student population, although both contain students reporting the highest breath of

involvement (i.e., eight different types of group experiences). Both classes share a high probability for the following indicator variables: academics, programming, honors, leadership, new student transitions, and governance groups. Social Collegiates also have a high probability for social fraternities and sororities and intramurals, while Cultural Collegiates add cultural groups to their list. Students of color and women were over-represented in the Cultural Collegiate class in comparison with their White and male peers. Kuh et al. (2000) identified a similar result with men under-represented in the class of students they identified as collegiates. Both the Cultural and Social Collegiates share a high breadth of involvement and experiences in campus-wide groups characterized by representation of constituents and influence over the campus environment. One could speculate that they differ, perhaps, in the routes through which they came to the campus-wide positions. Both of these classes are perhaps the closest in describing what other taxonomies (Astin, 1993a; Clark & Trow, 1966; Kuh et al.; Tabor & Hackman, 1976) meant when creating or replicating a category labeled collegiate or a derivative of the term. This taxonomy suggests, however, that collegiates do not just demonstrate a high rate of participation in co-curricular group experiences, but also a high degree of campus influence, engagement, and investment.

Athletes

The latent class labeled as Athletes represented the interaction of factors associated with patterns of involvement in sports, arts, and a diffuse set of experiences. Group experiences with the highest probabilities for this class included intramurals, club sports, intercollegiate athletics, and to a lesser degree, academic

experiences. The probability for participation in intramurals was extremely high (86%) and this was the only class in which intercollegiate athletics demonstrated a significant probability. Members reported involvement in an average of three different types of group experiences and approximately 21% of students were assigned to this latent class. The presence of the diffuse pattern suggested that involvement beyond sports likely represented a random set of experiences. White students and men were over-represented in these classes while women and students of color were under-represented. The class bears similarities to Kuh et al.'s (2000) student category labeled Recreators, although their measures included variables with less of a direct relationship to sports (e.g., playing games in the student union, individual exercise). They did, however, report a similar over-representation of men in the category. The fact that participants in club sports and intercollegiate athletics seemed to cluster as a latent class in its own right was relatively consistent with existing research. Scholarship on student athletes suggests that in general, commitments to varsity and club teams reduces the amount of time available for other co-curricular activities, which is reflected in lower levels of participation outside of the athletic arena (Carodine, Almond, & Gratto, 2001; Greer & Robinson, 2006; Howard-Hamilton & Sina, 2001).

Social Recreators

The Social Recreators class developed from intersections between latent factors associated with involvement in sports, arts, and traditional collegiate patterns. The group experiences with the highest probabilities included: intramurals, club sports, social fraternities and sororities, campus-wide programming, governance, and

academics. Students in this class reported involvement in an average of six different types of group experiences and members made up 11% of the total student population. Men were over-represented in this class. The class derived its name from the nature of the sports activities (i.e., intercollegiate athletics is not represented) and influences from campus-wide involvement. Intuitively, one can see connections between many of the group experiences associated with this class. Social fraternity and sorority membership is associated with higher degrees of student involvement in other clubs and organizations (Pike, 2000, 2003), and Greek-letter organizations typically have their own governance structure, programming initiatives, and divisions in intramural sports (Mauk, 2006). Although in name this class may seem similar to the category Kuh et al. (2000) labeled Recreator, they differ substantially as the Recreator in their taxonomy demonstrated significantly lower levels of co-curricular involvement than students in other categories, which was not the case here.

Recreational Academics

Factors associated with involvement in sports, academic careers, and diffuse patterns combined to create the latent class labeled Recreational Academics. This class demonstrated extremely high probabilities (i.e., between 88% and 93%) on a small number of indicators that included: academic groups, intramurals, and honor societies. Membership in this group accounted for about 8% of the overall population and students reported involvement in an average of five different co-curricular group experiences. Given the presence of the diffuse pattern, it is likely that involvement beyond the three primary group experiences was random. Again, men were over-represented in this class as were White students. The key differentiation between this

class and the Social Recreators lies in the emphasis on academic-related groups. One might assume that the pattern reflects students focused on academic endeavors, but willing to participate in intramurals as a recreational outlet.

Leadership Outcomes and Demographics

The purpose of this study was not to explore in depth the relationships between the emergent taxonomy and student outcomes and demographics. These variables were largely introduced as a means to determine the extent to which emergent latent classes discriminated between one another. This was proven to be the case, which furthered the validity of the emergent taxonomy. However, analyses from these questions also contribute to furthering knowledge beyond a concern for validity and merit an abbreviated consideration in their own right.

This study identified significant mean differences on a measure of socially responsible leadership based on membership in different classes in the emergent taxonomy. Interestingly, class memberships associated with the traditional collegiate pattern of involvement (i.e., Social Collegiates, Cultural Collegiates, Identity and Expression Leaders, and Social Recreators) were generally statistically significantly higher than those with the more diffuse pattern of involvement. Of these, the greatest magnitudes of difference were positively associated with classification as either Social Collegiates or Cultural Collegiates. This data did not determine the cause of these differences, although it may have related to the breadth and amount of group experiences (Huang & Chang, 2004), the opportunity to assume more positional leadership roles (Dugan, 2007; Kezar & Moriarty, 2000), and/ or the nature of the mentoring and staff interactions associated with traditional collegiate involvement

experiences (Jabaji, Slife, Komives, & Dugan, 2007; Kuh et al., 2000; Thompson, 2006).

A significant relationship was also identified between both race and gender and the eight classes of the emergent taxonomy. Over and under-representation of particular genders and races were detailed in the interpretation of each class in the previous section. It is important to note, however, how these relationships related to previous research. Findings from both Astin's (1993a) and Kuh et al.'s (2000) studies indicated differences across taxonomy categories by gender, which was consistent with this study. However, divergent findings were found as it related to race. Astin's study failed to account for influences of race while Kuh et al. determined that racial identification was equally distributed across categories of their taxonomy. This study found the reverse with over-representation of students of color in some classes (i.e., Affinity Group Affiliates and Identity and Expression Leaders) and under-representation in other classes (i.e., Athletes and Recreational Academics). It could be that these differences reflect the lack of variables associated with cultural or identity-based student experiences in the Kuh et al. study. The finding of differential involvement among students based on race is consistent with other research that considered racial differences in student involvement (DeSousa & King, 1992; Hoffman, 2002; MacKay & Kuh, 1994; Watson & Kuh, 1996).

Implications

A variety of implications stem from the findings associated with this study. These implications have the potential to influence both research and practice in

student affairs and higher education. Potential influences of the study related to each of these areas are explored in the sections that follow.

Higher Education Research

Findings from this study answered the persistent call from researchers to examine patterns of student involvement in group experiences and the degree to which they shape student subcultures (Gellin, 2003; Foubert & Grainger, 2006; Hernandez et al., 1999; Hoffman, 2002; Kuh et al., 2000; Moore et al., 1998; Renn & Bilodeau, 2005a). The resultant latent class taxonomy has the potential to influence future research design in higher education. The taxonomy could serve as a conceptual model from which to further explore patterns of student involvement or individual classes. Alternatively, the taxonomy could serve as a new tool in the measurement of student involvement that avoids the weaknesses associated with scattershot, macro-level, or micro-level approaches. Use of the latent factors as actual questions (i.e., representing the eight unique patterns of involvement) could significantly reduce the number of items in survey instruments in turn decreasing the amount of perceived burden for respondents and potentially increasing overall response rates (Crawford, et al., 2001; DeVellis, 2003). Findings from this study present a clear option for reducing the total number of group experience items while still capturing the critical influence of patterns of student involvement.

An additional benefit for research in higher education lies in the degree to which findings allow for a more accurate approach to measuring college impact. Researchers suggest that understanding the outcomes of college requires not just the ability to measure them, but also a keen understanding of unique student subcultures

and how they relate to outcomes (Kuh et al., 2000; Renn & Arnold, 2003). This claim is supported by recent calls for more research examining the conditional effects of the college environment on student subpopulations (Pasacarella, 2006; Pascarella & Terenzini, 2005).

The latent class taxonomy generated from this study could potentially influence college impact research in two key ways. First, latent classes provide a clearly defined set of student subpopulations for use in conditional analyses. This would allow for an examination of a variety of collegiate outcomes as they relate to populations for which practitioners have some degree of influence (e.g., administrators can encourage or discourage student involvement in particular patterns of involvement). Second, latent factors could be used in traditional college impact models to replace scattershot, macro-level, or micro-level variables intended to measure college involvement. This study resulted in both eight latent classes representing unique student populations as well as four latent factors representing unique patterns of involvement across co-curricular group experiences. The latent factors could be substituted into traditional college impact models to measure involvement in lieu of the more traditional macro-level, micro-level, or scattershot approaches. This would allow for a more accurate assessment of the contributions of involvement in co-curricular group experiences to student outcomes.

Furthermore, the latent classes established in this study demonstrate a significant improvement in classification accuracy than categories from previous studies. Astin (1993a) was unable to classify 39% of the students from his sample, a fact that related at least partially to his use of traditional factor analysis. Factor

analytic techniques group variables, not cases, which means that the classification of students reflect associations with variables rather than other cases. In this study, all students were able to be classified, largely due to the probabilistic nature of latent class analysis and its focus on grouping cases. Additionally, the classification error rate was a relatively low 28% for this study. Kuh et al. (2000) conducted a factor analysis prior to their cluster analysis to reduce the total number of variables. They reported that factors in their analysis explained a total of 42% of the overall variance. Latent factors from this study improved upon this by explaining between 48% and 50% of the total variance with classification error rates between 15% and 18%. This offers a marked improvement over existing models both in terms of the ability to examine patterns as well as the accuracy of the measures.

Professional Practice

Scholars suggest that understanding peer cultures and subgroups can significantly improve the quality of student learning (Kuh, 1990, 1995; Renn & Arnold, 2003). More specifically, Astin (1993a) suggested typologies are useful for both determining where to direct educational interventions as well as how to individualize them to the unique needs of various student populations. A number of implications from this study flow from these assumptions. First and foremost, the emergent taxonomy serves as a useful heuristic tool to understand student subgroups associated with patterns of involvement. This provides a framework for recognizing relationships among and between types of co-curricular group involvement experiences. Findings also identified significant relationships between latent class membership and both race and gender. Again, these findings are useful for both

understanding how students are involved and who typically populates various peer reference groups. This information can in turn be used to shape the nature of educational interventions as well as points of delivery. For example, if a student affairs unit wishes to increase outreach to students of color, focusing efforts in the locations where Affinity Group Affiliates and Identity and Expression Leaders congregate would likely be more effective than focusing on venues associated with Athletes or Recreational Academics. A further refinement in targeting interventions in this example might include outreaching specifically to Affinity Group Affiliates given on average this latent class is involved in fewer types of group experiences and their involvement rarely includes the traditional collegiate experiences prevalent for Identity and Expression Leaders.

Initial findings from this study also suggest that patterns of involvement reflecting traditional collegiate experiences may demonstrate high degrees of influence as evidenced by the strength of their association with higher leadership scores. If this is the case, it positions group experiences associated with the pattern (i.e., paraprofessionals, new student transitions, leadership, campus-wide programming, and governance groups) as highly influential. More research is needed to confirm this to be sure. However, should this be the case, it ought to be a wake-up call for student affairs practitioners regarding the amount of time invested in students within this pattern (i.e., Social and Cultural Collegiates) in relationship to their relative size. Students with any degree of influence from the traditional collegiate pattern represent only a third of the student population in this study and those with the highest degree of influence from the pattern, and likely the most direct contact with

administrators, represent only 8% of the sample. Practitioners may need to consider how to redistribute their time and attention to better serve the educational needs of a broader range of students.

Finally, a number of co-curricular group experiences examined in this study played a defining role in the involvement patterns across multiple latent factors and classes. Specifically, academic groups, intramurals, and honor societies each influenced the patterns of at least four different latent classes. To what extent, then, could these specific groups serve as "gateway experiences" useful for drawing students into other patterns of involvement that may relate more directly to positive outcomes? Student affairs practitioners could either target students within these experiences for advising support to potentially shift their patterns of involvement or design specific educational interventions to address learning needs. Academic groups offer a particularly powerful gateway as this type of experience factored into six of the eight latent classes. Advising for these types of organizations is often only loosely influenced by student affairs units and tends to fall to the academic disciplines in which the group is grounded. This would appear to be an enormous entry point for student involvement and exceptional opportunity for student affairs practitioners to intervene.

The implications presented represent potential influences on both higher education research and practice. Additional research replicating the study, validating the model, and connecting latent classes to educational outcomes would significantly improve its utility in educational research and practice. Perhaps the greatest

implication of this study, then, is its establishment of a foundation from which to build.

Limitations

Like any research, this study was restricted by a number of limitations, many of which relate directly to the methodological design. This section outlines several limitations associated with design elements, the conceptualization of measures, and the analytic approach.

Design Limitations

Two limitations related to the design of this research program should be clearly identified. The first concerns the sample used in the study to identify the latent class taxonomy. Although a national research project with data from a total of 50 institutions, the sample was strongly biased towards full-time, traditionally-aged students attending four-year institutions. The design decision was made to limit cases for this analysis to students at four-year schools who were enrolled full-time. The national profile at the time of data collection, however, suggested that approximately 40% of students nationally attended community colleges and just over half were enrolled part-time (Chronicle Almanac, 2006). Additionally, data in this study skewed towards traditionally-aged students with 87% of participants falling between the ages of 18 and 24. National statistics suggest only about 57% of student fall within that age range (Chronicle Almanac). Findings from this study, then, should be considered as generalizable only to the population from which the data was sampled. Caution is encouraged when using findings at two-year colleges, with non-traditionally aged students, or those that are enrolled part-time.

The second design limitation relates to the use of cross-sectional data and the simulation of a longitudinal approach using retrospective questions. Although this particular research did not rely heavily on educational outcomes, the overall MSL study from which data was drawn does. Therefore, some consideration of this is appropriate to contextualize the nature of the data set and its limitations. Astin and Lee (2003) expressed concern regarding the large amount of cross-sectional research being conducted that attempts to simulate longitudinal designs especially when used as an indicator of institutional effectiveness. However, research does indicate that when measuring self-reported leadership development as an educational outcome, retrospective questions may provide a stronger indication of student gains due to concerns associated with response-shift bias (Howard, 1980; Howard & Dailey, 1979; Rohs, 1999, 2002; Rohs & Langone, 1997). The inherent assumption in measurement of change is a common metric used for measurement at each point in time and that:

> A person's standard for measurement of the dimension being assessed will not change from pretest to posttest. If the standard of measurement were to change, the posttest ratings would reflect this shift in addition to the actual changes in the person's level of functioning. Consequently, comparisons of pretest with posttest ratings would be confounded by this distortion of the internalized scale. (Rohs & Langone, p. 51)

This would suggest that cross-sectional research may be appropriate when examining leadership development. Furthermore, this study is not necessarily interested in examining institutional effectiveness or comparing scores across institutions. Past research suggests that institutional factors tend to play an insignificant role in

predicting leadership as an educational outcome (Antonio, 2000; Astin, 1993b; Kimborough & Hutcheson, 1998; Smart et al., 2002). Additionally, the focus of this research was on student level data.

Limitations of Measures

Limitations also exist in the way in which certain variables were operationalized in this study. First, the 21 categories of co-curricular involvement used in this research were a direct source of limitation. The accuracy of latent class analysis reflects the degree to which input variables are both appropriate and accurately reflect the phenomena being measured (Everitt et al., 2001; Hair et al., 1998; Hair & Black, 2000; Vermunt & Magidson, 2005). As such, the inclusion or exclusion of a particular variable can affect the final result. Significant attention was paid to the development of the categories of group involvement experiences to ensure that they were representative of the participating schools and overall landscape of opportunities for students nationally. That process was detailed in chapter three. However, one could likely argue for the inclusion, adaptation, or exclusion of variables based on alternative hypotheses. Furthermore, none of the variables reflected group involvement experiences that occur outside the context of the college environment. Weidman (1989) suggested that non-college reference groups (e.g., community organizations, religious associations, work environments, parent-teacher associations) demonstrate potential for influencing college student socialization and ultimately college outcomes as well. For this study, these groups were excluded for two reasons. First, the direct interest was in student groups for which institutions of higher education may have some potential influence. Second, the degree to which

non-college reference groups are characterized by high degrees of peer interaction was not something that could be widely determined. As such, variables in this study were restricted to those in the college environment and those predicated by high degrees of peer interaction.

An additional limitation of the 21 group experience variables is associated with their formatting as binary with a simple indication of participation or non-participation. Both Pace (1984) and Astin (1984) suggested that measures should account for the quality of effort or degree of physical and psychological investment in a given activity, which these measures do not do. Quality of effort is important given its degree of association with high quality experiences (Pace). Furthermore, peer group influence is typically a function of the degree to which the groups are meaningful to a student and the amount of effort expended in an activity can serve as a strong proxy for this (Newcomb, 1962; Pace). The choice to use binary variables that did not measure quality of effort was made given the length of the instrument and this block of items in particular. It was feared that students' perceptions of burden with regard to the instrument would be increased too dramatically and have a negative influence on the overall return rate should students be required to respond to 21 variables each with five levels of response (Crawford et al., 2001; DeVellis, 2003). Although this limits the findings from this study, results still provide a much needed platform for future research on this topic and are among the first to examine patterns in co-curricular involvement in group experiences.

A final measurement limitation is associated with the concept of leadership as measured in this research, which is a function of the post-industrial paradigm and

theoretically grounded using the social change model. This model posits that leadership is a relational and group process, values-based, geared towards fostering change, and characterized by social responsibility (Astin & Astin, 2000; HERI, 1996). Comparatively, Bass (1990) suggested that there are almost as many definitions of leadership as those who have studied it. Many of these other definitions, particularly those related to management paradigms, are not consistent with the definition advanced in this research. As such, results of this study are solely a function of the particular form of leadership described here. Different relationships between the leadership outcome and various latent classes might have arisen were an alternative definition of leadership used in this study.

Analytic Limitations

A number of limitations arise given the analytical techniques employed in this study. First, much like cluster analysis, latent class analysis blends elements of both art and science (Everitt et al, 2001; Hair & Black, 2001; Vermunt & Magidson, 2005). Latent class analysis reduces the degree to which this is the case over cluster analysis, but ultimately the researcher is required to interpret the meanings of latent factors and classes. This can potentially introduce a degree of bias into the results. Second, latent class analysis classifies students into discrete classes, but the results do not describe the path through which students become involved in these groups nor the degree to which interactions occur across discrete groups. Renn and Arnold (2003) suggested that student typologies are meaningful tools for understanding "who" students are, but they fail to express "how" students become involved in the groups in the first place. This, they suggested, is an important omission that limits the degree to

which educational interventions can be accurately targeted (Renn & Arnnold). This study also does not capture the degree to which students interacted across and between latent classes, an important consideration that could affect the influence of class membership on educational outcomes (Kuh et al., 2000).

A final analytical limitation addresses the fact that this research represented participants from a total of 52 different institutions. Given cases in this study were essentially nested within individual institutions, some would argue that a multilevel approach should have been used to examine effects at multiple levels simultaneously (Raudenbush & Bryk, 2002). Latent class analysis is able to control for multilevel data through processes similar to structural equation modeling and hierarchical linear modeling (Vermunt, 2003). This approach, however, was not used in this study given influences associated with institutional characteristics have largely been proven insignificant in previous research on leadership development (Antonio, 2000; Astin, 1993b; Kimborough & Hutcheson, 1998; Smart et al., 2002) as well as student typologies (Kuh et al., 2000; Pascarella & Terenzini, 2005).

Future Research

Recommendations for future research flow directly from the unique findings observed from this study as well as limitations associated with it. First and foremost, studies are needed that attempt to replicate these findings. Pascarella (2006) suggested that "Findings are ultimately accepted as valid by the scientific community only to the extent they are replicable" (p. 510). He went on to challenge that replication studies remain relatively undervalued in higher education research, despite their necessity for confirming the validity of findings. Although this study enhanced

perceptions of validity by splitting the sample to test and then confirm results, future research should examine the extent to which the same latent class taxonomy emerges using other data. Of particular importance is testing the model in the context of studies un-related to college student leadership development as well as with samples that better represent students at two-year institutions, non-traditionally-aged students, and part-time students. Another line of inquiry should examine the extent to which Weidman's (1989) assertions regarding the influence of non-college reference groups holds true and the degree to which it potentially reshapes patterns of involvement identified in the latent class model presented here.

Researchers should also consider qualitative approaches to replicating the model, which would allow for a substantively deeper understanding of the latent classes and patterns of student involvement. Qualitative research might also add enough dimensions to determine the extent to which the classes represent a developmental sequence through which students proceed during the course of their college career. Although not evident from data in this study, one might infer movement within the emergent model with students beginning their involvement in patterns such as Affinity Group Affiliates moving to Identity and Expression Leaders and eventually ending as Cultural Collegiates. Should a developmental progression emerge, it would need to be considered in the content of students' cognitive, psychosocial, and social identity development. Characteristics of the environment (e.g., campus climate, available opportunities, structural and compositional diversity) that support or hinder progression should also be taken into account. Qualitative or

mixed-method approaches would be better suited for accurately capturing these complex and fluid variables.

Future research should also address Kuh's (1995) call for "high-stakes" research that takes into account the influence of student cultures on educational outcomes. Studies should examine the extent to which patterns of involvement as represented by the latent factors predict critical educational outcomes such as cognitive development, psychosocial development, identity development, student appreciation of diversity, career-related skills, and educational attainment and persistence. Does the use of patterns of involvement demonstrate differential results from those obtained using the more typical scattershot, macro-level, or micro-level approaches? Are there differences in outcomes between latent class subgroups and students that report no involvement in co-curricular group experiences? Conditional analyses could also be conducted looking at differential influences on college outcomes for students within each of the identified latent classes.

Finally, further research should be conducted to profile students within each of the latent classes identified in this research. Implications for practice will increase as it becomes more clear who it is that occupies these subgroups of the student population. Researchers are encouraged to explore descriptions involving more traditional student demographic variables (e.g., age, socio-economic status, transfer status, college generational status) as well as those that are traditionally absent in the literature (e.g., sexual orientation, disability status, religious affiliation, political orientation). Additionally, data in this study represented patterns that had emerged near the end of the college experience. Research would be beneficial that examined

how these patterns evolve throughout the course of college to better understand how patterns influence students over time. Furthermore, research should consider the emergent classes in the context of taxonomies unexplored in this research. For example, studies should examine the extent to which the latent classes reflect classifications associated with Holland's (1966) theory of vocational personalities and environments. Specific attention could also be paid to investigating whether Holland's taxonomy could further inform the understanding of students classified as Academic Careerists in this research.

Conclusion

Estimates indicate that somewhere between half and three quarters of college students participate in a co-curricular group experience prior to graduation (NSSE, 2006; Dugan, 2007). Existing literature, however, has largely failed to account for patterns of involvement across different types of group experiences (Gellin, 2003; Foubert & Grainger, 2006; Hernandez et al., 1999; Hoffman, 2002; Moore et al., 1998; Renn & Bilodeau, 2005a), opting instead for designs using scattershot, macro-level, or micro-level approaches. This fundamentally biases outcomes and skews the general understanding of student involvement and its influences. This study directly addressed this issue through the examination of latent involvement patterns across 21 types of co-curricular group experiences. The study also extends the student taxonomy literature (e.g., Astin, 1993a; Clark & Trow, 1966; Kuh et al., 2000) through the redefinition and expansion of the category of students traditionally identified as collegiates (i.e., students that report involvement in co-curricular activities such as clubs and organizations). Latent involvement factors were used to

classify students into a taxonomy comprised of eight latent classes each reflecting the nature of its members' involvement patterns. In sum, these findings provide an important foundation from which to increase the understanding of both patterns of student involvement and student reference groups as well as their influence on critical college outcomes.

Appendix A

MSL Selection Criteria & Screening Factors

1. Institutional Control
    a. Public
    b. Private
2. Carnegie Classification
    a. Research- Extensive
    b. Research- Intensive
    c. Masters I
    d. Baccalaureate (merged)
    e. Associates Colleges
3. Institutional Size
    a. Small
    b. Medium
    c. Large
4. Geographic Region
    a. South
    b. East
    c. West
    d. Midwest
    e. Plains
5. Geographic Location
    a. Urban
    b. Suburban
    c. Rural
6. Primary Student Residence
    a. Commuter
    b. Residential
7. Special Focus
    a. Historically Black College or University (HBCU)
    b. Hispanic Serving Institution (HSI)
    c. Women's College
    d. Big Ten
    e. Ivy League
    f. Religious Affiliation
8. Curricular Leadership Program
    a. Institutionalized
    b. In Development
    c. None
9. Co-curricular Leadership Program
    a. Institutionalized
    b. In Development
    c. None
10. Current Use of Social Change Model
    a. Yes
    b. No
11. Institutional Commitment to Project
    a. High
    b. Moderate
    c. Low

12. Fee Assistance Needed
    a. Yes
    b. No

Appendix B

Participating Institutions and School Classifications

Institution	Carnegie Type	Public/ Private	Size
Auburn University	Research Extensive	Public	Large
Brigham Young University	Research Extensive	Private	Large
California State University, Northridge	Masters	Public	Large
California State University, San Marcos	Masters	Public	Medium
Claflin University	Baccalaureate	Private	Small
Colorado State University	Research Extensive	Public	Large
DePaul University	Research Intensive	Private	Medium
Drake University	Masters	Private	Medium
Drexel University	Research Intensive	Private	Medium
Elon University	Masters	Private	Medium
Florida International University	Research Extensive	Public	Large
Florida State University	Research Extensive	Public	Large
Franklin College	Baccalaureate	Private	Small
Gallaudet University	Masters	Private	Small
George Mason University	Research Intensive	Public	Large
Georgia State University	Research Extensive	Public	Large
John Carroll University	Masters	Private	Medium
Lehigh University	Research Extensive	Private	Medium
Marquette University	Research Extensive	Private	Medium
Meredith College	Masters	Private	Small
Metro State University	Baccalaureate	Public	Large
Miami University	Research Intensive	Public	Large

Monroe Community College	Associates College	Public	Large
Montgomery College	Associates College	Public	Large
Moravian College	Baccalaureate	Private	Small
Mount Union College	Baccalaureate	Private	Small
North Carolina State University	Research Extensive	Public	Large
Northwestern University	Research Extensive	Private	Medium
Oregon State University	Research Extensive	Public	Large
Portland State University	Research Intensive	Public	Large
Rollins College	Masters	Private	Small
Simmons College	Masters	Private	Small
St. Norbert College	Baccalaureate	Private	Small
State University of New York at Geneseo	Masters	Public	Medium
Susquehanna University	Baccalaureate	Private	Small
Syracuse University	Research Extensive	Private	Large
Texas A & M University	Research Extensive	Public	Large
Texas Woman's University	Research Intensive	Public	Medium
University of Arizona	Research Extensive	Public	Large
University of Arkansas	Research Extensive	Public	Large
University of California, Berkeley	Research Extensive	Public	Large
University of Illinois at Urbana-Champaign	Research Extensive	Public	Large
University of Maryland Baltimore County	Research Extensive	Public	Medium
University of Maryland College Park	Research Extensive	Public	Large

University of Maryland Eastern Shore	Research Intensive	Public	Medium
University of Minnesota	Research Extensive	Public	Large
University of Nevada Las Vegas	Research Intensive	Public	Large
University of New Hampshire	Research Extensive	Public	Large
University of North Carolina, Greensboro	Research Intensive	Public	Large
University of North Dakota	Research Intensive	Public	Large
University of Rochester	Research Extensive	Private	Medium
University of Tampa	Masters	Private	Medium

Appendix C

MSL Survey Instrument

NOTE:
This is a paper and pencil version of what will be presented as an on-line web survey. Skip patterns will automatically take the respondent to the appropriate section. Shaded sections/ items will be used in split samples and will not be asked of all participants.

COLLEGE INFORMATION

1. Did you begin college at your current institution or elsewhere? (Choose One)

- ○ Started here
- ○ Started elsewhere

2. Thinking about this academic term, how would you characterize your enrollment? (Choose One)

- ○ Full-Time
- ○ Less then Full-Time

3. What is your current class level? (Choose One)

- ○ First year/freshman
- ○ Sophomore
- ○ Junior
- ○ Senior
- ○ Graduate student
- ○ Other

4. Are you currently working OFF CAMPUS?
(Circle one) YES NO
If NO skip to #5

4a. Approximately how many hours do you work off campus in a typical 7 day week?

4b. In your primary off campus position, how frequently do you: (Circle one for each item)

1 = Never	**3 = Often**
2 = Sometimes	**4 = Very Often**

Perform repetitive tasks	1	2	3	4
Consider options before making decisions	1	2	3	4
Perform structured tasks	1	2	3	4
Have the authority to change the way some things are done	1	2	3	4
Coordinate the work of others	1	2	3	4
Work with others on a team	1	2	3	4

5. Are you currently working ON CAMPUS?
(Circle one) YES NO
if NO skip to #6

5a. Approximately how many hours do you work on campus in a typical 7 day week?

5b. In your primary position, how frequently do you: (Circle one for each item)

1 = Never	**3 = Often**
2 = Sometimes	**4 = Very Often**

Perform repetitive tasks	1	2	3	4
Consider options before making decisions	1	2	3	4
Perform structured tasks	1	2	3	4
Have the authority to change the way some things are done	1	2	3	4
Coordinate the work of others	1	2	3	4
Work with others on a team	1	2	3	4

6. In an average academic term, do you engage in any community service?
YES NO
if NO skip to #7

In an average academic term, approximately how many hours do you engage in community service? (circle one for each category).

As part of a class
0 1-5 6-10 11-15 16-20 21-25 26-30

With a student organization
0 1-5 6-10 11-15 16-20 21-25 26-30

As part of a work study experience
0 1-5 6-10 11-15 16-20 21-25 26-30

On your own
0 1-5 6-10 11-15 16-20 21-25 26-30

7. Check all the following activities you engaged in <u>during your college experience</u>.

- ○ Studied abroad
- ○ Experienced a practicum, internship, field experience, co-op experience, or clinical experience
- ○ Participated in a learning community or some other formal program where groups of students take two or more classes together.
- ○ Enrolled in a culminating senior experience (capstone course, thesis etc.)

○ None of the above

YOUR PERCEPTIONS BEFORE ENROLLING IN COLLEGE

8. Looking back to *before you started college*, how confident were you that you would be successful at the following:
(Circle one response for each.)

1 = Not at all confident 3 = Confident
2 = Somewhat confident 4 = Very confident

Handling the challenge of college-level work	1	2	3	4
Feeling as though you belong on campus	1	2	3	4
Analyzing new ideas and concepts	1	2	3	4
Applying something learned in class to the "real world"	1	2	3	4
Enjoying the challenge of learning new material	1	2	3	4
Appreciating new and different ideas, beliefs	1	2	3	4
Leading others	1	2	3	4
Organizing a group's tasks to accomplish a goal	1	2	3	4
Taking initiative to improve something	1	2	3	4
Working with a team on a group project	1	2	3	4

9. Looking back to *before you started college*, how often did you engage in the following activities:
(Circle one response for each.)

1 = Never 3 = Often
2 = Sometimes 4 = Very Often

Performing volunteer work	1	2	3	4
Participating in student clubs/ groups	1	2	3	4
Participating in varsity sports	1	2	3	4
Took leadership positions in student clubs, groups or sports	1	2	3	4
Participating in community organizations (e.g. church youth group, scouts)	1	2	3	4
Taking leadership positions in community organizations	1	2	3	4
Participating in activism in any form (e.g. petitions, rally, protest)	1	2	3	4
Getting to know people from backgrounds different than your own	1	2	3	4
Learning about cultures different from your own	1	2	3	4
Participating in training or education that developed your leadership skills	1	2	3	4

10. Looking back to *before you started college*, please indicate your agreement with the following items by choosing the number that most closely represented your opinion about that statement AT THAT TIME:
(Circle one response for each.)

1 = Strongly disagree 4 = Agree
2 = Disagree 5= Strongly Agree
3 = Neutral

Hearing differences in opinions enriched my thinking	1	2	3	4	5	
I had low self esteem	1	2	3	4	5	
I worked well in changing environments	1	2	3	4	5	
I enjoyed working with others toward common goals	1	2	3	4	5	
I held myself accountable for responsibilities I agree to	1	2	3	4	5	
I worked well when I knew the collective values of a group	1	2	3	4	5	
My behaviors reflected my beliefs	1	2	3	4	5	
I valued the opportunities that allowed me to contribute to my community,	1	2	3	4	5	
I thought of myself as a leader ONLY if I was the head of a group (e.g. chair, president)	1	2	3	4	5	

11a. Before you started college, **how would you describe the amount of leadership experience you have had (e.g., student clubs, performing groups, service organizations, jobs)?** Please circle the appropriate number
No experience 1 2 3 4 5 Extensive experience

11b. Before you started college, **how often did others give you positive feedback or encourage your leadership ability (e.g., teachers, advisors, mentors)?**
Please circle the appropriate number
Never 1 2 3 4 5 frequently

11c. Before you started college, **How would you have reacted to being chosen or appointed the leader of a group?** Please circle the appropriate number
Very uncomfortable 1 2 3 4 5 very comfortable

11d. Before you started college, **how often did you see others be effective leaders?**
Please circle the appropriate number
Never 1 2 3 4 5 frequently

11e. Before you started college, **how often did you think of yourself as a leader**
Please circle the appropriate number
Never 1 2 3 4 5 frequently

YOUR EXPERIENCE IN COLLEGE

12. How often have you engaged in the following activities during your college experience:
(Circle one for each item)

1 = Never 3 = Often
2 = Sometimes 4 = Very Often

Paid attention to national issues	1	2	3	4
Paid attention to global issues	1	2	3	4
Was aware of the current issues facing the community surrounding your institution	1	2	3	4
Signed a petition or sent an email about a social or political issue	1	2	3	4
Bought or did not buy a product or service because of your views about the social or political values of the company that produces or provides it	1	2	3	4
Contacted a public official, newspaper, magazine, radio, or television talk show to express your opinion	1	2	3	4
Took part in a protest, rally, march, or demonstration	1	2	3	4

13. Since starting college, how often have you:

been an involved member or active participant in college organizations?
Never 1 2 3 4 5 Much of the time

held a leadership position in a college organization? (for example, serving as an officer or a club or organization, captain of an athletic team, first chair in a musical group, section editor of the newspaper, chairperson of a committee)
Never 1 2 3 4 5 Much of the time

been an involved member or active participant in an off-campus community organization (e.g. PTA, church group)?
Never 1 2 3 4 5 Much of the time

held a leadership position in a community organization? (for example, serving as an officer or a club or organization, leader in a youth group, chairperson of a committee)
Never 1 2 3 4 5 Much of the time

YOUR STUDENT GROUP INVOLVEMENTS

14. Which of the following kinds of student groups have you been involved with during college?
(Check all the categories that apply)

- ○ Academic/ Departmental/ Professional (e.g., Pre-Law Society, an academic fraternity, Engineering Club)
- ○ Arts/Theater/Music (e.g., Theater group, Marching Band)
- ○ Campus-wide programming groups (e.g., program board, film series board, a multicultural programming committee)
- ○ Cultural/ International (e.g., Black Student Union, German Club)
- ○ Honor Society (e.g., Omicron Delta Kappa [ODK], Mortar Board, Phi Beta Kappa)
- ○ Living-learning programs (e.g., language house, leadership floors, ecology halls)
- ○ Leadership (e.g., Peer Leadership Program, Emerging Leaders Program)
- ○ Media (e.g., Campus Radio, Student Newspaper)
- ○ Military (e.g., ROTC)
- ○ New Student Transitions (e.g., admissions ambassador, orientation advisor)
- ○ Para professional group (e.g., Resident assistants, peer health educators)
- ○ Political/ Advocacy (e.g., College Democrats, Students Against Sweatshops)
- ○ Religious (e.g., Campus Crusades for Christ, Hillel)
- ○ Service (e.g., Circle K, Alpha Phi Omega [APO])
- ○ Culturally based fraternities and sororities (e.g., National Pan-Hellenic Council (NPHC) groups such as Alpha Phi Alpha Fraternity Inc., or Latino Greek Council groups such as Lambda Theta Alpha)
- ○ Social fraternities or sororities (e.g. Panhellenic or Interfraternity Council groups such as Sigma Phi Epsilon or Kappa Kappa Gamma)
- ○ Sports- Intercollegiate or Varsity (e.g., NCAA Hockey, Varsity Soccer)
- ○ Sports- Club (e.g., Club Volleyball)

- ○ Sports- Leisure or Intramural (ex: Intramural flag football, Rock Climbing)
- ○ Special Interest (ex: Comedy Group)
- ○ Student governance group (ex: Student Government Association, Residence Hall Association, Interfraternity Council) IF CHECKED go to item 14A

14A. Were you involved in your campus-wide student government association? (Circle one) YES NO

If No, skip to item 15.

Thinking about your student government experience, indicate your level of agreement with the following items:
(Circle one response for each.)

1 = Strongly disagree 4 = Agree
2 = Disagree 5 = Strongly agree
3 = Neutral

I found it hard to represent my constituents' concerns	1	2	3	4	5
I successfully initiated change on behalf of my constituents (e.g., policy, institutional, or social)	1	2	3	4	5
My motivation for involvement was about gaining influence	1	2	3	4	5
My motivation for involvement was to receive recognition	1	2	3	4	5
My motivation for involvement was to help others	1	2	3	4	5
I have witnessed effective constituency-based efforts for change	1	2	3	4	5
Effective constituency-based efforts for change have influenced my own actions	1	2	3	4	5
I held a constituency-based position prior to this college SGA experience (e.g. high school or other governance group)	1	2	3	4	5
Experience with previous constituency based positions did NOT make me more effective in my college SGA work	1	2	3	4	5

15. At any time during your college experience, how often have you been in mentoring relationships where another person intentionally assisted your growth or connected you to opportunities for career and personal development?
Indicate how many times

Student affairs staff
(e.g., a student organization advisor, career counselor, the Dean of Students, or residence hall coordinator):
..... never once several many

Faculty ..... never once several many

Employers ..... never once several many

Community members ..... never once several many
Other students ..... never once several many

16. During interactions with other students outside of class, how often have you done each of the following in an average school year? (Circle one for each.)
1 = Never 3 = Often
2 = Sometimes 4 = Very Often

Talked about different lifestyles/ customs	1	2	3	4
Held discussions with students whose personal values were very different from your own	1	2	3	4
Discussed major social issues such as peace, human rights, and justice	1	2	3	4
Held discussions with students whose religious beliefs were very different from your own	1	2	3	4
Discussed your views about multiculturalism and diversity	1	2	3	4
Held discussions with students whose political opinions were very different from your own	1	2	3	4

DEVELOPING YOUR LEADERSHIP ABILITIES

17. **Since starting college, how many times have you participated in the following types of training or education that developed your leadership skills (ex: courses, Resident Assistant training, organization retreats, job training)** (Circle one for each.)

17a- Short-Term Experiences (ex: individual or one-time workshops, retreats, conferences, lectures, or training)
Never once several many

17b-Moderate-Term Experiences (ex: a single course, multiple or ongoing retreats, conferences, institutes, workshops, and/or training.
Never once several many

If NEVER skip to 17c;

Did your experience involve any academic courses?
YES NO

If no, skip to 17c

a. How many leadership courses have you completed?

b. How many other courses have you taken that contributed to your leadership abilities (e.g. ethics course, personal development courses, management courses)? *Keep in mind you might have taken such a course but it did not contribute to your leadership.*

17c- Long-Term Experiences (ex: multi-semester leadership program, leadership certificate program, leadership minor or major, emerging leaders program, living-learning program),

Never once several many

if NEVER skip to 18

Which of the following Long-Term Activities did you experience? (check all that apply)

- ○ Emerging or New Leaders Program
- ○ Peer Leadership Program
- ○ Leadership Certificate Program
- ○ Multi-Semester Leadership Program
- ○ Senior Leadership Capstone Experience
- ○ Residential Living-learning leadership program
- ○ Leadership Minor
- ○ Leadership Major
- ○ Other

ASSESSING LEADERSHIP DEVELOPMENT

18. Please indicate your agreement or disagreement with the following items by choosing the number that most closely represents your opinion about that statement.
(Circle one response for each.)

***For the statements that refer to a group, think of the most effective, functional group of which you have been a part.* This might be a formal organization or an informal study group. For consistency, use the same group in all your responses.**

1 = Strongly disagree **4 = Agree**
2 = Disagree **5= Strongly Agree**
3 = Neutral

I am open to others' ideas	1	2	3	4	5
Creativity can come from conflict	1	2	3	4	5
I value differences in others	1	2	3	4	5
I am able to articulate my priorities	1	2	3	4	5
Hearing differences in opinions enriches my thinking	1	2	3	4	5
I have low self esteem	1	2	3	4	5
I struggle when group members have ideas that are different from mine	1	2	3	4	5
Transition makes me uncomfortable	1	2	3	4	5
I am usually self confident	1	2	3	4	5
I am seen as someone who works well with others	1	2	3	4	5
Greater harmony can come out of disagreement	1	2	3	4	5
I am comfortable initiating new ways of looking at things	1	2	3	4	5
My behaviors are congruent with my beliefs	1	2	3	4	5
I am committed to a collective purpose in those groups to which I belong	1	2	3	4	5
It is important to develop a common direction in a group in order to get anything done	1	2	3	4	5
I respect opinions other than my own	1	2	3	4	5
Change brings new life to an organization	1	2	3	4	5
The things about which I feel passionate have priority in my life	1	2	3	4	5
I contribute to the goals of the group	1	2	3	4	5
There is energy in doing something a new way	1	2	3	4	5
I am uncomfortable when someone disagrees with me	1	2	3	4	5
I know myself pretty well	1	2	3	4	5
I am willing to devote the time and energy to things that are important to me	1	2	3	4	5
I stick with others through difficult times	1	2	3	4	5
When there is a conflict between two people, one will win and the other will lose	1	2	3	4	5
Change makes me uncomfortable	1	2	3	4	5
It is important to me to act on my beliefs	1	2	3	4	5
I am focused on my responsibilities	1	2	3	4	5
I can make a difference when I work with others on a task	1	2	3	4	5
I actively listen to what others have to say	1	2	3	4	5
I think it is important to know other people's priorities	1	2	3	4	5

My actions are consistent with my values	1	2	3	4	5
I believe I have responsibilities to my community	1	2	3	4	5
I could describe my personality	1	2	3	4	5
I have helped to shape the mission of the group	1	2	3	4	5
New ways of doing things frustrate me	1	2	3	4	5
Common values drive an organization	1	2	3	4	5
I give time to making a difference for someone else	1	2	3	4	5
I work well in changing environments	1	2	3	4	5
I work with others to make my communities better places	1	2	3	4	5
I can describe how I am similar to other people	1	2	3	4	5
I enjoy working with others toward common goals	1	2	3	4	5
I am open to new ideas	1	2	3	4	5
I have the power to make a difference in my community	1	2	3	4	5
I look for new ways to do something	1	2	3	4	5
I am willing to act for the rights of others	1	2	3	4	5
I participate in activities that contribute to the common good	1	2	3	4	5
Others would describe me as a cooperative group member	1	2	3	4	5
I am comfortable with conflict	1	2	3	4	5
I can identify the differences between positive and negative change	1	2	3	4	5
I can be counted on to do my part	1	2	3	4	5
Being seen as a person of integrity is important to me	1	2	3	4	5
I follow through on my promises	1	2	3	4	5
I hold myself accountable for responsibilities I agree to	1	2	3	4	5
I believe I have a civic responsibility to the greater public	1	2	3	4	5
Self-reflection is difficult for me	1	2	3	4	5
Collaboration produces better results	1	2	3	4	5
I know the purpose of the groups to which I belong	1	2	3	4	5
I am comfortable expressing myself	1	2	3	4	5
My contributions are recognized by others in the groups I belong to	1	2	3	4	5
I work well when I know the collective values of a group	1	2	3	4	5
I share my ideas with others	1	2	3	4	5
My behaviors reflect my beliefs	1	2	3	4	5
I am genuine	1	2	3	4	5
I am able to trust the people with whom I work	1	2	3	4	5
I value opportunities that allow me to contribute to my community	1	2	3	4	5
I support what the group is trying to accomplish	1	2	3	4	5
It is easy for me to be truthful	1	2	3	4	5

THINKING MORE ABOUT YOURSELF

19. How would you characterize your political views?
(Mark One)

- ○ Far left
- ○ Liberal
- ○ Middle-of-the-road
- ○ Conservative
- ○ Far right

20. In thinking about how you have changed <u>during college</u>, to what extent do you feel you have grown in the following areas? (Circle <u>one</u> response for each.)

1 = Not grown at all 3 = Grown
2 = Grown somewhat 4 = Grown very much

Ability to put ideas together and to see relationships between ideas	1	2	3	4
Ability to learn on your own, pursue ideas, and find information you need	1	2	3	4
Ability to critically analyze ideas and information	1	2	3	4
Learning more about things that are new to you	1	2	3	4

21. Please indicate the extent to which you agree or disagree with the following statements.
(Circle <u>one</u> response for each.)

1 = Strongly disagree 3 = Agree
2 = Disagree 4 = Strongly agree

Since coming to college, I have learned a great deal about other racial/ethnic groups	1	2	3	4

I have gained a greater commitment to my racial/ethnic identity since coming to college .. 1 2 3 4

My campus's commitment to diversity fosters more division among racial/ethnic groups than inter-group understanding 1 2 3 4

Since coming to college, I have become aware of the complexities of inter-group understanding..... 1 2 3 4

THINKING ABOUT LEADERSHIP

22. How confident are you that you can be successful at the following: (Circle one response for each.)

1 = Not at all confident 3 = Confident
2 = Somewhat confident 4 = Very confident

Leading others..... 1 2 3 4

Organizing a group's tasks to accomplish a goal. 1 2 3 4

Taking initiative to improve something 1 2 3 4

Working with a team on a group project..... 1 2 3 4

23. To what degree do you agree with these items? (Circle one response for each.)

1 = Strongly disagree
2 = Disagree
3 = neither agree or disagree
4 = Agree
5 = Strongly agree

It is the responsibility of the head of a group to make sure the job gets done 1 2 3 4 5

A person can lead from anywhere in the organization, not just as the head of the organization 1 2 3 4 5

I spend time mentoring other group members..... 1 2 3 4 5

I think of myself as a leader ONLY if I am the head of a group (e.g. chair, president) 1 2 3 4 5

Group members share the responsibility for leadership 1 2 3 4 5

I am a person who can work effectively with others to accomplish our shared goals..... 1 2 3 4 5

I do NOT think of myself as a leader when I am just a member of a group..... 1 2 3 4 5

Leadership is a process all people in the group do together 1 2 3 4 5

I feel inter-dependent with others in a group. 1 2 3 4 5

I know I can be an effective member of any group I choose to join..... 1 2 3 4 5

Teamwork skills are important in all organizations 1 2 3 4

The head of the group is the leader and members of the group are followers.....1 2 3 4

YOUR COLLEGE CLIMATE

24. Select the number that best represents your experience with your overall college climate

Closed, hostile, intolerant, unfriendly	1	2	3	4	5	6	7	Open, inclusive, supportive, friendly

BACKGROUND INFORMATION

25. What were your average grades in High School? (Choose One)

- ○ A or A+
- ○ A- or B+
- ○ B
- ○ B- or C+
- ○ C
- ○ C- or D+
- ○ D or lower

26. Did your high school require community service for graduation? (Circle One) ..... YES NO

27. What is your age?

28. What is your gender?

- ○ Female
- ○ Male
- ○ Transgender

29. What is your sexual orientation?

- ○ Heterosexual
- ○ Bisexual
- ○ Gay/Lesbian
- ○ Rather not say

30. Indicate your citizenship and/ or generation status: (Choose One)

- ○ Your grandparents, parents, and you were born in the U.S.
- ○ Both of your parents AND you were born in the U.S.
- ○ You were born in the U.S., but at least one of your parents was not
- ○ You are a foreign born, naturalized citizen

- o You are a foreign born, resident alien/ permanent resident
- o You are on a student visa

31. Please indicate your racial or ethnic background. (Mark all that apply)

- o White/Caucasian
- o African American/Black
- o American Indian/Alaska Native
- o Asian American/Asian
- o Native Hawaiian/Pacific Islander
- o Mexican American/Chicano
- o Puerto Rican
- o Cuban American
- o Other Latino American
- o Multiracial or multiethnic
- o Race/ethnicity not included above

32. Do you have a mental, emotional, or physical condition that now or in the past affects your functioning in daily activities at work, school, or home?

Yes No

if Yes Please indicate all that apply:

- o Deaf/Hard of Hearing
- o Blind/Visually Impairment
- o Speech/language condition
- o Learning Disability
- o Physical or musculoskeletal (e.g. multiple sclerosis)
- o Attention Deficit Disorder/ Attention Deficit Hyperactivity Disorder
- o Psychiatric/Psychological condition (e.g. anxiety disorder, major depression)
- o Neurological condition (e.g. brain injury, stroke)
- o Medical (e.g. diabetes, severe asthma)
- o Other

33. What is your current religious affiliation? (Choose One)

- o None
- o Agnostic
- o Atheist
- o Buddhist
- o Catholic
- o Hindu
- o Islamic
- o Jewish
- o Mormon
- o Quaker
- o Protestant (e.g. Baptist, Methodist, Presbyterian)
- o Other
- o Other Christian
- o Rather not say

34. What is your best estimate of your grades so far in college? [Assume 4.00 = A] (Choose One)

- o 3.50 – 4.00
- o 3.00 – 3.49
- o 2.50 – 2.99
- o 2.00 – 2.49
- o 1.99 or less
- o No college GPA

35. What is the HIGHEST level of formal education obtained by any of your parent(s) or guardian(s)? (Choose one)

- o Less than high school diploma or GED
- o High school diploma or GED
- o Some college
- o Associates degree
- o Bachelors degree
- o Masters degree
- o Doctorate or professional degree (e.g., JD, MD, PhD)
- o Don't know

36. What is your best estimate of your parent(s) or guardian(s) combined total income from last year? If you are independent from your parents, indicate your income. (Choose one)

- o Less than $12,500
- o $12,500 - $24,999
- o $25,000 – $39,999
- o $40,000 – $54,999
- o $55,000 - $74,999
- o $75,000 - $99,999
- o $100,000 - $149,999
- o $150,000 - $199,999
- o $200,000 and over
- o Don't know
- o Rather not say

37. Which of the following best describes where are you currently living while attending college? (Choose one)

- o Parent/guardian or other relative home
- o Other private home, apartment, or room
- o College/university residence hall
- o Other campus student housing
- o Fraternity or sorority house
- o Other

INDIVIDUAL CAMPUS ITEMS

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Appendix D

IRB Approval Letter

UNIVERSITY OF MARYLAND
INSTITUTIONAL REVIEW BOARD

2100 Lee Building
College Park, Maryland 20742-5121
301.405.4212 TEL 301.314.1475 FAX
irb@deans.umd.edu
www.umresearch.umd.edu/IRB

October 21, 2005

MEMORANDUM

Application Approval Notification

To:	Dr. Susan R. Komives, Mr. John Dugan Ms. Paige Haber, Ms. Jennifer Smist Office of Campus Programs, National Clearinghouse for Leadership Programs
From:	Roslyn Edson, M.S., CIP RaE IRB Manager University of Maryland, College Park
Re:	Application Number: 05-0454 Project Title: "The Multi-Institutional Study of Leadership"
Approval Date:	October 21, 2005
Expiration Date:	October 21, 2006
Type of Application:	New Project
Type of Research:	Nonexempt (Please note: This research does not qualify for an exemption because a contractor, Survey Sciences Group, will collect identifiable private information [the students' electronic mail addresses] for the investigator.)
Type of Review For Application:	Expedited

The University of Maryland, College Park Institutional Review Board (IRB) approved your IRB application. The research was approved in accordance with 45 CFR 46, the Federal Policy for the Protection of Human Subjects, and the University's IRB policies and procedures. Please reference the above-cited IRB application number in any future communications with our office regarding this research.

Recruitment/Consent: For research requiring written informed consent, the IRB-approved and stamped informed consent document is enclosed. The IRB approval expiration date has been stamped on the informed consent document. Please keep copies of the consent forms used for this research for three years after the completion of the research.

(continued)

Continuing Review: If you want to continue to collect data from human subjects or analyze data from human subjects after the expiration date for this approval, you must submit a renewal application to the IRB Office at least 30 days before the approval expiration date.

Modifications: Any changes to the approved protocol must be approved by the IRB before the change is implemented, except when a change is necessary to eliminate apparent immediate hazards to the subjects. If you would like to modify the approved protocol, please submit an addendum request to the IRB Office. The instructions for submitting a request are posted on the IRB web site at: **http://www.umresearch.umd.edu/IRB/irb_Addendum%20Protocol.htm**

Unanticipated Problems Involving Risks: You must promptly report any unanticipated problems involving risks to subjects or others to the IRB Manager at 301-405-0678 or redson@umresearch.umd.edu.

Student Researchers: Unless otherwise requested, this IRB approval document was sent to the Principal Investigator (PI). The PI should pass on the approval document or a copy to the student researchers. This IRB approval document may be a requirement for student researchers applying for graduation. The IRB may not be able to provide copies of the approval documents if several years have passed since the date of the original approval.

Additional Information: Please contact the IRB Office at 301-405-4212 if you have any IRB-related questions or concerns.

Appendix E

IRB Renewal Letter

UNIVERSITY OF MARYLAND
INSTITUTIONAL REVIEW BOARD

2100 Blair Lee Building
College Park, Maryland 20742-5125
301.405.4212 TEL 301.314.1475 FAX
irb@deans.umd.edu
www.oonresearch.umd.edu/IRB

MEMORANDUM
Renewal Approval Notification

October 1, 2007

To: Dr. Susan R. Komives
John Dugan
Lee Calizo
Kristan Cilente
Kirsten Freeman Fox
Jon Garland
Sean Gehrke
Renardo Hall
Katie Hershey
Ramsey Jajabi
Karol Martinez
Marlena Martinez
Jim Neumeister
Daniel Ostick
Julie Owen
Jeremy Page
Tom Segar
Nathan Slife
Wendy Wagner
Office of Campus Programs

From: Roslyn Edson, M.S., CIP
IRB Manager
University of Maryland, College Park

Re: **IRB Application Number:** 05-0454
Title of Research Project: "The Multi-Institutional Study of Leadership"

Approval Date: September 28, 2007

Expiration Date: September 28, 2008

Type of Application: Renewal

Type of Research: Nonexempt

Type of Review: Expedited

The University of Maryland, College Park Institutional Review Board (IRB) approved your IRB application. The research was approved in accordance with the University's IRB policies and procedures and 45 CFR 46, the Federal Policy for the Protection of Human Subjects. Please reference the above-cited IRB application number in any future communications with our office regarding this research.

Recruitment/Consent: For research requiring written informed consent, the IRB-approved and stamped informed consent document is enclosed. The IRB approval expiration date has been stamped on the informed consent document. Please keep copies of the consent forms used for this research for three years after the completion of the research.

Continuing Review: If you want to continue to collect data from human subjects or analyze data from human subjects after the expiration date for this approval, you must submit a renewal application to the IRB Office at least 30 days before the approval expiration date.

Modifications: Any changes to the approved protocol must be approved by the IRB before the change is implemented except when a change is necessary to eliminate apparent immediate hazards to the subjects. If you want to modify the approved protocol, please submit an IRB addendum application to the IRB Office.

Unanticipated Problems Involving Risks: You must promptly report any unanticipated problems involving risks to subjects or others to the IRB Manager at 301-405-0678 or redson@umresearch.umd.edu.

Student Researchers: Unless otherwise requested, this IRB approval document was sent to the Principal Investigator (PI). The PI should pass on the approval document or a copy to the student researchers. This IRB approval document may be a requirement for student researchers applying for graduation. The IRB may not be able to provide copies of the approval documents if several years have passed since the date of the original approval.

Additional Information: Please contact the IRB Office at 301-405-4212 if you have any IRB-related questions or concerns.

Appendix F

First Email Contact Template

Dear {UserData:FName},

You have been randomly selected by [INSERT INSTITUTION NAME] to participate in a national study of college student experiences. Your participation is VERY important and will contribute a great deal to understanding the student experience at both [INSERT INSTITUTION NAME] and in the broader context of higher education. This is an amazing opportunity for [INSERT INSTITUTION NAME] and we hope you are excited to participate.

To participate in the survey, please follow these instructions:

1. Go to http://www.ssgresearch.com/leadership
2. Enter the following ID: {UserData:CUSTOMID}
3. Click the Start Survey button on the screen to begin

Participation is easy and just by completing the survey you will automatically be entered into a raffle for numerous prizes including: {INSERT LIST OF INSTITUTIONAL INCENTIVES}.

What does it mean to participate?

- Participation will involve completing an online survey/questionnaire about your college involvement and thoughts about leadership.
- The survey should take approximately 20 minutes to complete.

- Your response is completely confidential.
- Participation is totally voluntary and you may withdraw at any time.
- Take note of your unique Study ID: {UserData:CUSTOMID}, you will need to enter this ID into the login box on the website.

We encourage you now to click on the link above to indicate your consent to participate in the survey. If you have any questions, please contact [INSERT INSTITUTIONAL CONTACT NAME AND INFO]

Thank you for your participation!

Sincerely,

{INSERT INSTITUTIONAL CONTACT PERSON NAME}

{INSERT TITLE}

Appendix G

Second and Third Email Contacts Template

Dear {UserData:FName},

We recently contacted you concerning a national study of college students' experiences. [INSERT INSTITUTION NAME] is participating in the study and encourages your response. There is still time to participate.

Your participation is VERY important and will contribute a great deal to understanding the college student experience at both [INSERT INSTITUTION NAME] and in the broader context of higher education. This is an amazing opportunity for [INSERT INSTITUTION NAME] and we need your participation.

To participate in the survey, please follow these instructions:

1. Go to http://www.ssgresearch.com/leadership
2. Enter the following ID: {UserData:CUSTOMID}
3. Click the Start Survey button on the screen to begin

Participation is easy and just by completing the survey you will automatically be entered into a raffle for numerous prizes including: {INSERT INCENTIVES LIST}

What does it mean to participate?

- Participation will involve completing an online survey/questionnaire about your college involvement and thoughts about leadership.
- The survey should take approximately 20 minutes to complete.
- Your response is completely confidential.
- Participation is totally voluntary and you may withdraw at any time.
- Take note of your unique Study ID: {UserData:CUSTOMID}, you will need to enter this ID into the login box on the website.

Please take the time now to be part of this critical study. We encourage you to click on the link above to indicate your consent to participate in the survey. If you have any questions, please contact [INSERT INSTITUTIONAL CONTACT NAME AND INFO].

Thank you for your participation!

Sincerely,

{INSERT INSTITUTIONAL CONTACT PERSON NAME}

{INSERT TITLE}

Appendix H

Final Email Contact Template

Dear {UserData:FName},

We would like to thank everyone who responded to the Multi-Institutional Study of Leadership Survey. The response was tremendous and will help researchers better understand how experiences in and outside the classroom impact life and perceptions at college.

The study is very close to being completed. If you have not yet participated and would like to do so, please follow these simple instructions. Remember, completing the survey will enter you into a drawing to win one of the following prizes: {INSERT INCENTIVES LIST}

To participate in the survey, please follow these instructions:

1. Go to http://www.ssgresearch.com/leadership
2. Enter the following ID: {UserData:CUSTOMID}
3. Click the Start Survey button on the screen to begin

What does it mean to participate?

- Participation will involve completing an online survey/questionnaire about your college involvement and thoughts about leadership.
- The survey should take approximately 20 minutes to complete.

- Your response is completely confidential.
- Participation is totally voluntary and you may withdraw at any time.
- Take note of your unique Study ID: {UserData:CUSTOMID}, you will need to enter this ID into the login box on the website.

We encourage you now to click on the link below to indicate your consent to participate in the survey. If you have any questions, please contact: {INSERT INSTITUTIONAL CONTACT PERSON NAME}

Thank you for your participation!

Sincerely,

{INSERT INSTITUTIONAL CONTACT PERSON NAME}

{INSERT TITLE}

Appendix I

Consent Form for Participation

You have been randomly selected to participate in an important research project being conducted by [INSERT INSTITUTION NAME] and the National Clearinghouse for Leadership Programs. The purpose of this research project is to enhance knowledge regarding college student leadership development as well as the influence of higher education on the development of leadership capacities.

If you choose to participate in this important research study, you will be asked to complete an online survey that should take about 20 minutes. On this survey you will be asked questions pertaining to your pre-college and college experiences and attitudes.

- All information collected in this study will be kept confidential. Reports and presentations on the study will be based on grouped data and will not reveal your identity. Data will be collected by an independent contractor specializing in survey collection.
- There are no known risks associated with your participation in this study.
- Your participation is entirely voluntary, and you are free to withdraw from participation at any time. Failure to participate will not result in the loss of any benefit from your institution.
- The research is not designed to help you personally, but the benefits of participation include contributing to research on an important topic.

If you have any questions about participating in this study, please contact [INSERT INSTITUTION CONTACT NAME], your campus' principal investigator, at [INSERT PHONE NUMBER] or via email at [INSERT EMAIL ADDRESS].

If you have questions about your rights as a research subject or wish to report a research-related injury, please contact the campus Institutional Review Board Office at [INSERT LOCAL IRB CONTACT INFORMATION].

Answering "Yes" indicates that:

- you are at least 18 years of age;
- the research has been explained to you;
- your questions have been fully answered; and
- you freely and voluntarily choose to participate in this research project.

___ Yes, I wish to participate in this study and begin the instrument.

___ No, I do not wish to participate in this research study.

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