Leadership Practices of Science Department Chairs in Secondary Public Schools

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ABSTRACT

This study was designed to explore the transformational leadership practices of science department chairs as perceived by both science department chairs and their principals as measured quantitatively by the third edition of the Leadership Practice Inventory (LPI) (Kouzes & Posner, 2007). In addition to transformational leadership, three other paradigms of leadership were essential to this study: transactional leadership, teacher leadership, and distributed leadership. Science department chairs are recognized as formal teacher leaders, primarily because their situational position makes them formal leaders; in addition science department chairs teach, to some degree, hence they are acknowledged as teacher leaders. The study further sought to determine whether or not there is a difference in the perceptions of the science department chairs’ transformational leadership practices when demographics such as gender, age, educational experience, and professional experience are considered in the relationship.

The researcher was attempting to extract information on the leadership behaviors of individuals who serve in role of formal teacher leader positions in secondary public schools, whether it be gender, age, years of experience, highest degree attained, department size, or professional experiences. Through the extraction of data, the researcher was hoping to gain insight into what influences transformational leadership behaviors of science department chairs. Moreover, the researcher was hoping to see if certain transformational behaviors dominated the work of science department chair, and
if so what influenced those behaviors to be a dominate leadership trait over other behaviors.

The data collected from this study did show that science department chairs’ leadership style is transformational whether self-perceived by the department chairs or observed by the principals. However, the principal viewed the science department chairs’ transformational leadership behaviors to a lesser degree than the department chairs ranked themselves. Regardless of whose perceptions were being analyzed – principals or science department chairs – the research also indicated that out of the five transformational leadership practices science department chairs scored lowest in behaviors that involve ‘Challenging the Process’ and ‘Inspiring a Shared Vision’ within the organization.

The research demonstrated that in the demographic category of gender there was a difference in the scores of women and men, with women rating themselves as more transformational in nature than men. In the demographic category of age and gender, the research revealed that science department chairs who were females between the ages of 50-59 viewed themselves as having the highest degree of transformational practices. For the male population, the age range of 40-49 perceived themselves as being more transformational in practice than the other two age groupings for the male population. Lastly, the research demonstrated that in the category of experience, science department chairs with seven to nine years experience professed themselves to be the most transformational leaders. When experience was examined with gender, females with seven to nine years of experience alleged that most often they exhibited themselves to be more transformational leaders than other subgroups in the study. A limitation in this
study rests in the fact that all science department chairs self-evaluated their leadership practices, and another limitation is that not all of the principals who participated in the study paired with a science department chair who participated in the study.
CHAPTER I
INTRODUCTION

Historically, educational leadership has been associated with school administration – superintendents, assistant superintendents, principals, assistant and/or associate principals, and business managers. Much of the research in educational leadership has focused on the work of administrators (Reeves, 2006; Waters & Cameron, 2007), and similarly much of the research on leadership characteristics have focused on business leaders and administrators (Fullan, 2001; Kouzes & Posner, 2007; Maxwell, 1999). Since public education is operating in an open system, administrative leaders must adapt to an environment that is increasing demands while the financial support and public support is decreasing (Guskin, 1997). In the last decades, school reforms have resulted in increased public demands for more efficient schools and leaders (Davis, Darling-Hammond, LaPointe, & Meyerson, 2005).

The burdens of the educational system create a wide range of responsibilities and expectations for administrative leaders. Throughout a school year, schools require administrators to accomplish a myriad of tasks. Among them are curriculum work and revisions, professional growth associated with research-based best practices, involvement in student activities and athletics, observations and evaluations of teachers, collaboration time, effective assessment of and for learning, student registration to meet graduation requirements, high stakes national and state testing with the expectation of meeting No
Child Left Behind (NCLB) requirements, designing blended classrooms to implement technology for the 21st century, and school improvement plans to increase student learning. These myriad of tasks represent only a few of the overwhelming demands and responsibilities associated with the role of an administrator. Building administrators assume these responsibilities from which numerous and various decisions are made by them on a daily basis.

School administrators can no longer administrators stay abreast of, and answer to, the endless number of diverse issues and problems in a school (Gabriel 2005; Griffin, 1991; Pajak, 1994; Zinn, 1997). The complexities of schools have resulted in institutions that principals can no longer lead alone, and the traditional school leadership model has begun to change. The principal needs the help and support of teachers to fulfill the responsibilities of the position (Barth, 2001; Keedy & Finch, 1994), especially since principals come and go quickly within a school while the majority of the teaching staff has longevity with the school. Studies on effective leadership find consistently that the authority to lead does need not be found in a single person as the leader, but, instead should be dispersed among individuals and throughout the organization (Day et al., 2000; Gabriel, 2005; Harris, 2002c). Strong leadership engages the principal both and teachers in the decision-making process about school improvement with a focus on student learning. Administrative leaders should be distributing leadership to share the responsibilities collectively among all members of the learning community.

Principals could expand their schools’ proficiency and leadership for shared decision-making and impact student learning if they promoted leadership, specifically
teacher leadership (Barth, 1988; Blasé & Blasé, 1994). “The most reliable, useful, proximate, and professional help resides under the roof of the schoolhouse with the teaching staff itself” (Barth, 2001, p. 445) while the role of the principal is viewed as the “leader of leaders” (Schlechty, 1997, p. 71). As professionals, teachers are pivotal in advancing education. Unlike most administrators, teacher leaders remain grounded in classroom practice. Daily they exercise judgment in addressing ambiguity and uncertainty associated with students and student learning. They impose best practices as they relate to student learning, and so, “It follows, then, that teachers hold the tacit or craft knowledge needed to inform and lead improvement initiatives” (York-Barr & Duke, 2004, p. 256).

In an attempt to foster and to maintain a culture that focuses on improvement of curriculum, of programs, and of student learning, teachers are asked to accept additional responsibilities. Patterson (1993) defines leading “as the process of influencing others to achieve mutually agreed upon purposes for the organization” (p. 13). As teachers influence other teachers in a collaborative atmosphere leadership follows as the goals of the organization are shared and held in common. This collective collaboration builds capacity, empowers teachers, and alters the culture of a school. Teacher leadership arises from a new awareness of both organizational development and leadership, promoting active involvement from all levels of the organization and within all domains of the organization (Ogawa & Bossert, 1995; Spillane, Halverson, & Diamond, 2001; York-Barr & Duke, 2004). Experts believe that distribution of leadership responsibility to
other individuals in a school can potentially motivate teachers, improve instructional practices, and impact student learning for the better (Alger, 2008).

In order to create and develop teacher leaders, the principal and teachers leadership must understand the importance of leadership at this level. The capacity for leadership in an organization must be broad-based, and centered on student learning. Furthermore, purposeful participation in leadership needs to be practiced for it to be sustainable (Lambert, 2006). The organization needs to come to view leadership capacity as “reciprocal, purposeful learning in community settings” (p. 239). By infusing leadership throughout the community, interdependence will become both evident and coherent among teachers, and the culture of the organization will change. Although the teacher leadership structure directly challenges the traditional views of school leadership, it is the essential counterpart to both leadership capacity and administrative leadership. Ogawa and Bossert (1995) illustrate this point when they state, “Thus the currency on which leadership is based lies in the resources possessed by individuals” (p. 239). Ogawa and Bossert continue, “The medium of leadership is, however, not individual action but social interaction. Leadership affects the systems that produce the patterns of interactions that occur among organizational members; that is, it affects organizations’ structures” (p. 239).

The concept of teacher leadership suggests that teachers become empowered in two ways: by sharing a central position in the school, and by concentrating management responsibilities among teachers. The four reasons for schools to focus on teacher leadership are as follows: (a) benefits of employee participation; (b) expertise and
experience about teaching and learning; (c) acknowledgement, opportunities, and rewards for accomplished teachers; and (d) benefits to students (Hart, 1995; York-Barr & Duke, 2004). This inclusive environment inspires interpersonal relationships and collaboration while allowing the voices of all individuals to be a resource. By building leadership capacity among teachers, the community becomes more democratic and communal. In the end, if leadership capacity of teachers is established a culture of professionalism will flourish, and proponents will to seek to improve both the culture and the performance of the school.

Teacher leadership is not a new concept in education, but “What is new are increased recognition of teacher leadership, visions of expanded teacher leadership roles, and new hope for the contributions these expanded roles might make in improving schools” (Smylie & Denny, 1990, p. 237). Research reflects a surplus of forceful and descriptive arguments for advancing the concept and practice of teacher leadership; however, empirical evidence of the direct effects or influence of teacher leadership on school performance has limitations (Reeves, 2008; York-Barr & Duke, 2004). Studies on teacher leadership are primarily qualitative, case-study designs with smaller populations. Since teacher leadership is challenging to quantify, the main instrumentation is interview, and an occasional survey. Lastly, most research related to teacher leadership has been associated with teacher leaders in formal roles rather than informal roles.

York-Barr and Duke (2004) examined more than two decades of teacher leadership literature and failed to find a consistent definition for teacher leadership. Although the concept was neither clearly nor consistently defined, it was grounded within
several other leadership theories – participative leadership, organizational leadership, distributed leadership, and parallel leadership. What York-Barr and Duke did find were consistent behaviors associated with teacher leadership. Teacher leaders tend to be accomplished teachers, to be able to model effective instructional practices, to influence fellow teachers by encouraging sharing of best practices, to be supportive of improvement efforts in schools, to mentor new teachers. Teacher leaders establish effective relationships that foster the collaboration among colleagues and work toward the improvement of teaching and learning.

Current research views teacher leadership as an informal and voluntary leadership role held by a teacher, and it represents the highest level of professionalism; however, it can also be viewed as a formal role in schools. Danielson (2006) defined teacher leadership as referring “to a set of skills demonstrated by teachers who continue to teach students but also have an influence that extends beyond their own classrooms to others within their own school and elsewhere” (p. 12). Katzenmeyer and Moller (2001) defined it as “teachers who lead within and beyond the classroom, identify with and contribute to the community of teacher learners and leaders, and influence others towards improved educational practice” (p. 17). The students they serve intrinsically motivate teacher leaders. In turn, they activate and invigorate their colleagues to improve the school’s performance in terms of teaching and learning. Teacher leaders view themselves as teachers before anything else. They want to broaden their impact within the school, and are not necessarily seeking to become administrators (Danielson, 2006). Teacher leaders who are respected by colleagues are able to make noteworthy assistance with de-
privatizing practices, breaking down teacher isolation, and creating a more professional collaborative environment (Barth, 2001; Danielson, 2006; Hart, 1995; Lieberman & Miller, 1999; Talbert & McLaughlin, 1994; Weiss et al., 1992; York-Barr & Duke, 2004).

Over the past ten years, attention has shifted to informal teacher leaders. Informal teacher leaders represent leaders who are providing leadership in less structured or non-positional roles such as serving as the leader of a learning community, being a member of the school improvement team, serving as a literacy coach, and/or working on curriculum proposals with a team. Although the support is for informal teacher leader roles, most literature views teacher leadership as positional roles in schools to which teachers have been appointed by the administration. Frequently, teacher leadership is construed to be formal leadership roles having both management and pedagogical responsibilities (Katzenmeyer & Moller, 2001). These positions represent specific roles to be performed by the teacher thus making them formal teacher leaders.

Formal teacher leaders are department chairs, subject area coordinators, team leaders, or mentors (Aronow, 2006; Ash & Persall, 2000; Danielson, 2006; Gehrke, 1991). The majority of the formalized roles for teacher leaders often demand the teacher to move away from the classroom towards a greater administrative role. As schools attempt to expand the efforts to improve student learning, they recognize the vital role of formalized teacher leaders and creating a means by which work can be distributed beyond the principal and throughout the school. Often teachers view formal leadership roles as an extension of the administration. When this quasi-administrator perception
prevails, the colleagues of the formal leader do not see this formal teacher leader in the same category as themselves, especially if supervisory responsibilities are associated with the position. Even though there has been a greater focus on informal teacher leaders recently, the more prevalent view of teacher leadership in literature and practice is the traditional, formal, one-person leadership role (Archer, 2001; Fessler & Ungaretti, 1994; Guinney, 2001; Paulu & Winters, 1998). Both formal and informal teacher leadership roles are pathways for teachers to lead other teachers.

For the purpose of this study, teacher leaders have the following characteristics. First, they uphold the responsibility of teaching to some degree. Second, colleagues and administrators recognize teacher leaders as working towards the goals of school improvement, as attempting to build a collaborative culture, and as making positive contributions toward increasing student achievement. In doing this, they are participating regularly in the decision-making processes associated with both the school and the district. Third, their colleagues and other members of the community hold them in the highest level of respect and esteem. Lastly, teacher leaders in this study have the formal title of department chair.

The Institute for Educational Leadership (IEL) (2008) study sponsored by Met Life supports a distributed leadership model, if leadership is to positively influence school performance. Their emphasis on teacher leadership is more about shared influence or collaboration than it is about power. Michael Fullan (2001) stated, “The litmus test of all leadership is whether it mobilizes people’s commitment to putting their energy into actions designed to improve things. It is individual commitment, but above
all it is collective mobilization” (p. 9). If school improvement and increased student achievement are to occur within a school, teacher leadership which encompasses distributive leadership is the means through which it can happen. Muijs and Harris (2007) state “teacher leadership is conceptually closely linked to distributive leadership, but is narrower, being concerned exclusively with the leadership role of teaching staff, while simultaneously being broader…” (pp. 112-113). Leadership needs to be dispersed throughout an organization among the teachers. If the principal disperses leadership to formalized teacher leaders, then the formalized teacher leaders can, in turn, distribute leadership to informal teacher leaders. Distributing the leadership to teachers provides hope for any school that is looking for continuous improvement of teaching and learning with the results being measured by increased achievement for every student.

Department chairs – formal teacher leaders within specific subject areas – are expected to fulfill leadership functions and influence the cultures of their schools (Abloghasemi, McCormick, & Conners, 1999). Department chairs function as middle managers, and can have various titles throughout schools, such as subject area coordinator, instructional supervisor, subject leader, head of the department, and division head. Abloghasemi et al. agrees with Siskin’s (1991) study. The study suggests that academic departments are meaningful subunits that have a major role in the culture and authority of secondary schools. Dunham (1978) argues that department chairs are crucial personnel in high schools and may be deemed to be “the driving forces behind any school” (Earley & Fletcher, 1989, p. 102). In their study, Wilson and Corcoran (1988) state that department chairs and department members play essential leadership roles in
effective high schools. According to Siskin (1991) departments influence teachers and teaching in secondary schools. Siskin’s research indicates a high correlation between effective schools and the strength of the academic departments that compose the school. Department chairs perform as middle managers in secondary schools, employ influence over the members of their department, and serve as formalized teacher leaders. Barnett (1984) credits the department chairs’ authority to their critical position, described as the “neck of the hourglass” or within the transformation of information. According to Abolghasemi et al. (1999), Barnett argued that department heads, being in the middle position of hierarchy, have the capability to not only obtain information but to distribute it among the organization.

Harris (2002b) noted that “quality of leadership matters in determining the motivation of teachers, the quality of teaching, and the effectiveness of the school” (p. 332). Consistently, this statement has been validated by other educational researchers such as Hargreaves (1994), Sammons (1999), Sergiovanni (2001), as well as Silns and Mulford (2002). Harris (2002b) acknowledges there is an increasing trend in educational leadership where leadership practices reflect the rational and technical components while neglecting the complexity of social interactions. If department chairs are formalized leaders who employ influence over other teachers, distribute information to teachers, are driving forces, and have a major role in the culture and authority of the school, then they need to exhibit leadership practices that encompass the social-cultural perspective to build leadership capacity among teachers.
Burns (1978) made a fundamental distinction between the rational-technical components of leadership practices and the social-cultural perspective. Trading one thing for another was viewed as transactional leadership, while the other practice was known as transformational leadership, the ability to transform an organization. The prevailing orthodoxy of leadership is predominantly manager-like in orientation, clustered around post or position, and concerned chiefly with outcomes rather than processes. The managerial orientation represents transactional leadership, a necessary element of a leader but not the only factor in defining the quality of leadership. Opposing yet complimentary to transactional leadership is transformational leadership, the more desirable form of leadership, the form that has the ability to transform or change an organization. Transformational leadership is preferential because it is assumed to produce outcomes which surpass expectations (Bass, 1985; Burns, 1978).

Transactional leaders lead organizations toward rewards based on completion of tasks. Bass and Avolio (1994) described three forms of transactional leadership – (1) management by exception – passive, (2) management by exception – active, and (3) constructive transactional or laissez-faire leadership. If the transactional leader is passive, the followers view their job as maintaining the status quo. In contrast, the active transactional leaders aggressively monitor issues and behavior closely such that followers do not take risks or display ingenuity. The third form of transactional leadership, a constructive transactional leader sets goals, gives feedback, recognizes and praises employees, and consults. The major difference with this form is that followers are
encouraged to participate in the management process that allows them to achieve expected goals.

Transformational leadership is in direct opposition with transactional leadership. Instead of viewing leadership only from a managerial perspective or transactional approach, schools need to acknowledge that leadership can be transferred from person to person and it is independent from any social influence. Transformational leadership in education rests on the ability to transform or change organizations; it has the potential to empower and develop teacher leaders. According to Burns (1978), transformational leaders develop “a relationship of mutual simulation and elevation that converts followers into leaders and may convert leaders into moral agents” (p. 4). Transformational leadership is a form of leadership that attempts to help others understand the problems that confront them (Leithwood, Jantzi & Steinbach, 1999). The “four I’s” characterize behaviors or practices of the transformational leader. The four characteristics are: individual consideration, intellectual stimulation, idealized influence and inspirational motivation (Bass, 1985). The transformational leader is able to take away the incentive based on completion of the duty and instead lead the organization towards superior intentions. According to Bennis and Nanus (1985), “Transformational leaders commit people to action….convert followers into leaders, and….convert leaders into agents of change” (p. 3). By demonstrating transformational behaviors, the leader places the desires of the organization first and invites followers to become leaders. If these intentions occur, the organizational success is a result of the collaborative effort, shared responsibility, and collective investment of the dispersed leadership.
Leithwood (1994) developed the transformational model of school leadership based on the work of Burns (1978), Bass (1985), and Bass and Avolio (1994). Leithwood observed the four I’s which characterize the behavior of transformational leaders, noting how these four factors are essential skills for school principals if they are to meet the challenges of the 21st century (Marzano, Waters & McNulty, 2005). If these four factors are essential for principals, the principal must be a transformational leader. The behavior and practices of a transformational leader stand as a model for other teachers. If it is essential for principals of the 21st century to be transformational leaders, then it can be deduced that it is essential for all school leaders to be transformational leaders in order to be effective in meeting the needs of the 21st century. Principals who model transforming practices, and who distribute leadership to build leadership capacity in schools, are dispersing these transformational leadership practices among both formal and informal teacher leaders.

The quality of leadership makes a difference when it comes to motivation of teachers and the superiority of teaching in the classroom (Fullan, 2001; Muijs & Harris, 2007; Sergiovanni, 1999). Daily, teachers exercise leadership in schools. They use power to discipline children, they make decisions about curriculum, instruction, students and time, and they collaborate with their colleagues. Teachers set goals, evaluate and assess goals, and challenge students to reach beyond the goals. Communication with students, colleagues, parents and administration is essential on a daily basis. These characteristics represent qualities associated with leadership and incorporate transformational leadership (Hart, 1995). However, the transformational practices only
occur if the leadership practices are modeled for them by an individual or individuals in a superior position. School improvement literature, time after time, states that “effective leaders exercise an indirect influence on schools’ capacity to improve and upon the achievement of students, though this influence does not necessarily derive from senior managers, but can also at least partly lie in strengths of middle level leaders and teachers” (Muijs & Harris, 2007, p. 111).

Kouzes and Posner (1995) define leadership as “the art of mobilizing others to want to struggle for shared aspirations,” and they emphasize the concepts of choice and internal motivation of followers (p. 30). For the purpose of this study, leadership will have the following characteristics. First, the development and improvement of leadership is possible because leadership is a behavior, a practice. Second, collaboration becomes central to an organization when leadership is distributed throughout an organization. Distribution of leadership and empowering others allows the finest qualities to emerge from both leaders and followers. Third, two main components of leadership are the ability to influence and to have vision for the organization, for others, and for the leader. Lastly, leadership is a relationship that is not about personality but about behaviors. The assumption of the study is that leadership is fundamental to schools, it is essential to teaching and student learning, and it is a behavior that can be learned. Although the understanding of leadership associated with education increasingly is complex, it can be broken down into a set of discrete behaviors that can be taught and learned (Conger & Kanungo, 1998).
**Purpose of the Study**

The purpose of this study is to explore the transformational leadership practices of science department chairs as perceived by both science department chairs and their principals as measured by the third edition of the *Leadership Practice Inventory* (LPI) (Kouzes & Posner, 2007). In addition to transformational leadership, three other paradigms of leadership are essential to this study: transactional leadership, teacher leadership, and distributed leadership.

**Statement of the Problem**

For Kouzes and Posner (2007, 2002, 1995, 1987), leadership is a set of skills that can be developed and improved upon over time through practice as well as feedback from others. The definition of leadership utilized in this study is leaders who mobilize others to want to struggle for shared aspirations or get extraordinary things done in organizations (Kouzes & Posner, 2007, 2002, 1995, 1987). The assumption of the study is that leadership is fundamental and essential to both teaching and student learning.

Through extensive research, beginning in 1983, Kouzes and Posner (1987) wanted to know “what leaders did when they did their ‘personal best’ at leading, not managing, others” (p. xx). They developed a “personal best” survey consisting of thirty-eight questions. From an analysis of 550 of the “personal best” surveys, a short two-page form completed by another 780 managers, and 42 in-depth interview cases, they developed a model of leadership, and then wrote the *Leadership Practices Inventory* (LPI) to measure leadership behaviors. Finally, they asked over 3,000 managers and their subordinates to evaluate the extent to which the managers used the practices.
Through this work, Kouzes and Posner developed a theoretical leadership framework called the Five Practices of an Exemplary Leader Model. The five practices consist of: Model the Way, Inspire a Shared Vision, Challenge the Process, Enable Others to Act, and Encourage the Heart. Embedded in these five fundamental practices of leadership are behaviors that can serve as the basis for improving leadership. Their theory allows organizations to develop programs to improve leadership skills using the Five Practices of an Exemplary Leader Model and the LPI assessment tool (Kouzes & Posner, 2007, 2002, 1995, 1987).

Leadership practices are collective skills associated with transformational leaders. These practices are customary for leaders and do not change based on the job affiliation. Even though the leaders are distinctive individuals, there are shared patterns within all leadership roles. The practices correlate to essential behaviors (Kouzes & Posner, 2007, 2002, 1995, 1987). If leadership development is to occur, however, so too must self-development (Kouzes & Posner, 2007, 2002, 1995, 1987).

An organization needs to evaluate the practices of leaders to provide the leader with feedback, and then set goals for the leader to improve. The LPI assessment is a tool to help leaders assess their leadership practices. It measures the extent to which the leader uses the five practices associated with being an exemplary leader. The LPI assessment is able to identify strengths of the leader as well as to provide feedback such that the leader can set goals for improvement. In addition to the five practices, there are ten commitments of exemplary leadership practices, as shown in Table 1.
Table 1. Kouzes and Posner Leadership Model: The Five Practices and Ten Commitments

<table>
<thead>
<tr>
<th>Practices of Leadership</th>
<th>Commitments of Leadership</th>
</tr>
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| 1. Model the Way         | • Define values and celebrate shared ideals in order to build commitment.  
                            | • Set an example by upholding shared values consistently. |
| 2. Inspire a Shared Vision | • Envision a thrilling and ennobling future.  
                            | • Enlist others in the common vision by attracting them through shared goals, hopes, and desires. |
| 3. Challenge the Process | • Seek out opportunities by taking initiative and examining innovative ways to improve.  
                            | • Experiment, take risks and learn from the experience while attaining small victories. |
| 4. Enable Others to Act | • Build trust and assist in building relationships in order to cultivate a collaborative environment.  
                            | • Strengthen others by empowering them, by fostering independence, and by building competency while providing visible support. |
| 5. Encourage the Heart  | • Recognize contributions and show appreciation for individual successes on every project.  
                            | • Create a spirit of community by celebrating victories of individuals and teams. |


This study will investigate professional experience, gender, age, and educational level of science department chairs in relation to the five transformational leadership practices. Leadership studies regarding leadership and gender have surfaced conflicting results. Studies have shown that there is no significant difference between men and
women with regard to leadership practices (Posner & Brodsky, 1994). But more recent studies indicate that leadership practices differ between men and women (Adams & Keim, 2002; Rand, 2004). Since studies have shown conflicting results on gender and leadership, the examination of the role of gender as it relates to formal teacher leadership is essential.

**Research Questions**

This study will examine the self-perceptions of secondary public school science department chairs’ leadership practices in relationship to the principals’ perception of the science department chairs’ leadership practices in their building. Science department chairs are recognized as formal teacher leaders, primarily because their situational position makes them formal leaders; in addition science department chairs teach, to some degree, hence they are acknowledged as teacher leaders. They are designated as formal teacher leaders by colleagues and administrators because they work toward the goals of school improvement while attempting to build a collaborative culture and contributing positively towards increasing student learning and achievement. Due to their positional role, department chairs regularly participate in the decision-making processes associated with both the school and the district.

This study will focus on science department chairs, and thus the effect of positional or formal teacher leadership will be researched rather than informal teacher leadership. Alger (2008) researched similar questions; however, his study differed from this one because Alger compared the self-perceived leadership practices of informal
teacher leaders in relation to leadership practices of the informal leader as perceived by their principals.

The research questions to be investigated as part of this quantitative study are as follows:

**Research Question #1**: According to the science department chairs, what are the transformational leadership practices in which science department chairs engage?

**Research Question #2**: According to the principals, what are the transformational leadership practices in which science department chairs engage?

**Research Question #3**: How do background variables such as gender, professional experience, educational level, and age relate to transformational leadership practices of science department chairs as perceived by both science department chairs and principals?

**Research Question #4**: What is the relationship between the science department chairs’ self-perceptions of their transformational leadership practices and the principals’ observed perceptions of the science department chairs transformational leadership practices?

**Significance of the Study**

This study’s primary significance will be to examine the relationship between the science department chairs’ self-perceptions of their transformational leadership practices and the perceived transformational leadership practices of the science department chair as observed by the correlating principal, as well as to determine whether or not specific demographics such as age, educational experience, professional experience, and gender
play a role in the relationship. The study will demonstrate this by examining the transformational leadership practices of formalized teacher leaders, specifically science department chairs.

Within secondary public schools, the demands on formalized teacher leaders – science department chairs – are high if they are acting as both transactional and transformational leaders. If the department chairs possess transformational behaviors chances are great for these formalized teacher leaders to distribute the responsibilities throughout the department while developing a collaborative culture. In examining leadership practices, it is fitting that formalized teacher leaders engage in transformational practices rather than only transactional practices because transformational leadership behaviors call for followers to become leaders and allow the organization to reach a higher performance.

Research has demonstrated that transformational leadership practices are fitting for schools faced with significant challenges for change; however, empirical evidence about transformational leadership effects in a school context is “relatively thin” (Leithwood, 2004). Often superiors will model leadership. Consequently, connecting the observed-perceptions of the leadership practice for the science department chair with the self-perceptions of the leadership practices will allow us to connect multiple views on leadership. Harris (2002b) acknowledges, “a concentration upon the features, characteristics, and behaviors of effective leadership, instead of thorough relative accounts of leadership practices from multiple perspectives” (p. 335).
The second significance of the study is to gain further insight into the levels of transformational leadership practices among formal teacher leaders – science department chairs. According to Alger (2008), schools are developing teachers as leaders. There is a lack of empirical evidence, however, for the leadership behaviors associated with teacher leaders. This study will examine how professional experience, gender, age and educational level correspond to various levels of transformational leadership behaviors for formalized teacher leaders – science department chairs. It is important to recognize that leadership may have nothing to do with position or status but everything to do with behavior (Kouzes & Posner, 2007, 2002, 1995, 1987). Leadership is conceived as a set of skills and abilities that can be learned. Without self-assessment and personal reflection from the leader, growth and development of leadership practices for the leader will be nil.

The third significance of this study is to examine the role of the department chair as a formalized teacher leader. Existing research on the role of the department chair and on the department chair as a formal teacher leader is minimal in the United States. According to Aubrey-Hopkins (2002), compared to the role of the principal or head teacher, the role of the secondary school subject leader is relatively under researched. Since the formal position of department chairs exists in most secondary schools, it is remarkable to note that hardly any research has been done on the position of the department chair, a position which provides a means for teachers to function as formalized teacher leaders in schools. Research on principals, administrative teams, and teachers is plentiful, but it appears the department chair has been subsumed in reference to either teachers or administration. Furthermore, there is an inadequate understanding of
the past and present leadership development of department chairs from their educational preparation programs, to their self-development, to their career experience, as well as to gender and age. This study can provide data and recommendations to teacher educators, building administrators, and department chairs as to the self-development and leadership development needs of individuals who are preparing to become department chairs or who are currently in the role of department chair. The demographical data also may provide insight into the variation of leadership practices that exist for science department chairs due to experience, education, age, and gender.

The final significance of the study is to examine leadership practices in a distinctive subject area in secondary schools, specifically science. Each subject occupies different features, histories and prominence that can alter the work of the teachers (Goodson, 1985; Stodolsky, 1993). More often than not, departments in secondary schools present their own subculture. These characteristic subcultures represent differing beliefs, norms, and practices for the various departments. Grossman (1995) notes, “As we have already indicated, teachers of different subjects bring differing frames of reference to their teaching; these subject-matter frames, which inform teachers’ thoughts and actions must be better understood” (p. 8). By examining only one subject area, the results of the investigation will provide insight into teacher leadership within this realm. This study will allow us to examine the leadership behaviors of science department chairs and possibly make some of the implicit behaviors of these leaders explicit. This study will also provide a starting point for comparing formalized teacher leadership positions in different subject areas. Grossman (1995) states, “A comparative approach toward
understanding subject-matter differences among high school teachers is crucial for analysis and reform of secondary school teaching” (p. 5).

**Limitations**

1. This study will be limited to public high schools in the suburbs of Chicago, Illinois.

   This limits the generalizations associated with the findings.

2. This study does not account for the variation of the role expectations set by the senior management at each particular school and/or district.

3. The instrument measures only practices, not beliefs. An individual could have a cognitive belief about a situation, but the practice could be different due to the description associated with the role of the position.

4. Statistical tests have inherent limitations that will be discussed in the methodology section of Chapter III.

**Delimitations**

1. This study will be limited to science department chairs in public suburban high schools between Interstate 80 and the Illinois-Wisconsin border. Omitting other teacher leaders in no way negates the value of their leadership practices as teacher leaders.

2. The only department chair to be studied is the science department chair. Since the culture of various departments differs, studying other subject areas might lead to different results.

3. Excluded from the study are other building level administrators such as associate principals and assistant principals as well as central office administrators such as
superintendents and assistant superintendents. These administrators interact with the science department chair and can be seen as superiors who may be capable of noting the observed leadership characteristics of the science department chair; however, omitting these leaders in no way negates the value of their observed perceptions of the leadership characteristics of the science department chair.

Summary

The purpose of this study is to investigate the relationship between the transformational leadership practices of formal teacher leaders - science department chairs - as perceived by both the science department chairs and the principals and as measured by the Leadership Practice Inventory (LPI) developed by Kouzes and Posner (2007, 2002, 1995, 1987). The study will determine whether or not there is a difference in the perceptions of the science department chairs’ transformational leadership practices when demographics such as gender, age, educational experience, and professional experience are considered in the relationship.

Transformations are seen as deep changes that can affect the essence of an organization as well as its core values. Transformations within schools have the potential to occur if the administration of schools build leadership capacity and expand shared leadership (Griffin, 1995). The review on teacher leadership by York-Barr and Duke (2004) suggests “Leadership practices and possibilities for teachers are numerous and varied, and as such leadership opportunities for teachers also are numerous and varied” (p. 263).
Administrators of schools have a multitude of responsibilities leaving limited
time to devote to transforming schools and being instructional leaders. They can no
longer stand alone if transformations within schools are to occur. If leadership behaviors
that are transformational are distributed throughout an organization to formal and
informal teacher leaders, then transformations will occur affecting the organizational
culture and student learning. Copeland (2001) notes that, for transformation to occur, we
must create and instigate a process where all members of a school community emerge as
leaders.
CHAPTER II
REVIEW OF THE LITERATURE

In the 1990s, as schools began to restructure in North America, terms like shared leadership, moral leadership, servant leadership, teacher leadership, distributed leadership, and transformational leadership became accepted by both practitioners and scholars as effective forms of leadership, because the instructional leadership model centered too much on the principal’s expertise, power, and authority (Hallinger, 2003). Apparent as an obstacle to effective school leadership is the leader who attempts to carry the burden alone. Establishing and sustaining an organizational culture focused on student learning, school improvement, leadership capacity, and professional growth is one of the most significant challenges associated with leadership in the field of education (Alger, 2008). When a leader makes an attempt to move beyond the transactional components of the job to establish and sustain a collaborative organizational culture, the burden becomes more intense for the leader (Barth, 1980; Cuban, 1988).

The administration of a school cannot overcome these challenges alone, and as a result, numerous experts in the field of education support the distribution of leadership within a school (Alger, 2008; Fullan, 2001; Harris, 2003; Lambert, 1998; Leithwood & Riehl, 2003; Sergiovanni, 2001). When one used the term “leader” it must be in an inclusive sense of the word, a reference beyond the administrators of the school (DuFour, DuFour, Eaker, & Many, 2006). Lambert (2002b) believes “the days of the lone
instructional leader are over. We no longer believe that one administrator can serve as instructional leader for the entire school without the substantial participation of other educators” (p. 37). Fullan (2006) concludes, “It has become clear that leadership at all levels of the system is the key level for reform, especially leaders who a) focus on capacity building and b) develop other leaders who can carry on” (p. 33).

The purpose of this review is to present key ideas of educational leadership but also to focus on four leadership paradigms – transactional leadership, transformational leadership, teacher leadership, and distributed leadership. This review concentrates on these paradigms because this study is trying to demonstrate the value of both transformational leadership and teacher leadership as it relates to the role of the department chair and organizational change. The following questions were used to specifically guide this research:

• According to the science department chairs, what are the transformational leadership practices in which science department chairs engage?

• According to the principals, what are the transformational leadership practices in which science department chairs engage?

• How do background variables such as gender, professional experience, educational level, and age relate to transformational leadership practices of science department chairs as perceived by both science department chairs and principals?

• What is the relationship between the science department chairs’ self-perceptions of their transformational leadership practices and the principals’ observed perceptions of the science department chairs transformational leadership practices?
Much research has been conducted that identifies desirable traits, behaviors and characteristics of school leaders (Kouzes & Posner 2007, 2002, 1995, 1987; Maxwell, 1999; Sergiovanni, 1992). In order to expand on this learning, the research reviewed literature to examine the extent of the relationship of leadership behaviors as it relates to finding ways to enhance leadership of formalized teacher leaders. As part of the investigation, the review incorporates the role of the department chair and how it has evolved over time, as well as the leadership behaviors associated with the role of the department chair.

**Leadership**

Leadership is an omnipresent term proclaimed in various sectors of our society, yet its understanding remains ambiguous. Although there is a plethora of research on leadership, none of it provides society with a universal understanding of the term and its implications. Burns (1978) claims, “Leadership is one of the most observed and least understood phenomena on earth. The crisis of leadership today is the mediocrity or irresponsibility of so many of the men and women in power” (p. 1). Burns continues, “The fundamental crisis underlying mediocrity is intellectual. If we know too much about leaders, we know far too little about leadership” (p. 1).

Bennis and Nanus (1985) note, “Literally thousands of empirical investigations of leaders have been conducted in the last seventy-five years alone, but no clear and unequivocal understanding exists as to what distinguishes leaders from non-leaders, and perhaps more important, what distinguishes effective leaders from ineffective leaders” (p. 4). According to Vroom and Jago (2007), even though this quote is over 20 years old, a
recent review of literature on leadership would reveal it still holds true today.

Leithwood, Jantzi, and Steinbach (1999) contends there is no agreed upon definition for the term leadership. Yukl (2002) includes, “the definition of leadership is arbitrary and very subjective. Some definitions are more useful than others, but there is no ‘correct’ definition” (pp. 4-5).

Gardner (1988) observed, “the impulse of most leaders is much the same today as it was a thousand years ago: accept the system as it is and lead it” (p. 24). This impulse, associated with leadership, must be overcome by any individual who wishes to perform in any position of leadership within a school. The challenge of leading effectively in schools is daunting and arduous. Sagor (1992) recognizes that leadership is more than making decisions. Leadership for Sagor is “…finding a way to be successful in collaboratively defining the essential purpose of teaching and learning and then empowering the entire school community to become energized and focused” (p. 14). Sagor continues, “In schools where such a focus has been achieved, we found that teaching and learning became transformative for everyone” (p. 14).

Laflin (2009) asserts leadership has been defined in terms of “individual traits, behaviors, influence over others, interaction patterns, role relationships, hierarchical position, and the perception of others regarding influence” (p. 22). Vroom and Jago (2007) maintain all definitions of leadership encompass the view that leadership involves the process of influence such that leaders have the potential or capacity to influence others. They believe the processes of how influence occurs are countless, and the form of influence defines the different models of leadership. For Kazar and Carducci (2006), the
models of leadership are a means by which leadership is defined, but these models are
guided by the principles of social control and hierarchy as well.

Yukl (1994) believes, “Leadership influences the interpretation of events for
followers, the choice of objectives for the group or organization, the organization of work
activities to accomplish objectives, the motivation of followers to achieve the objectives,
the maintenance of cooperative relationships and teamwork, and the enlistment of support
and cooperation from people outside the group or organization” (p. 3). Yukl perceives
leadership as being influential in terms of followers, objectives, activities, relationships
and personal motivation.

According to Leithwood (2004), “setting directions and exercising influence” are
two components that are indispensable to the definition of leadership. Bennis (1989)
proclaims, “Leaders are people who do the right thing and managers are people who do
things right” (p. 18). Leithwood (2004) supports Bennis’ statement by acknowledging
“doing things right” is management while “doing right things right” is leadership.

For Leithwood and Louis (1999) “influence seems to be a necessary part of most
conceptions of leadership” (p. 9). Yukl (2002) acknowledges individuals and groups can
exert influence. Ogawa and Bossert (1995) recognize that leadership involves influence,
and any individuals in the organization can employ it. Ogawa and Bossert define
leadership as “something that flows throughout an organization, spanning levels and
flowing both up and down hierarchies” (p. 26).

Cuban (1988) adds, “Leadership, then refers to people who bend the motivations
and actions of others to achieving certain goals; it implies taking initiatives and risks” (p.
Fidler (1997) supports Cuban's claim that influence is purposeful, leading to specific outcomes. Fidler states, “followers are influenced towards goal achievement” (p. 25).

For Stoll and Fink (1996), leadership is an invitation for others to see how the organization operates. They express, “Leadership is about communicating invitational messages to individuals and groups with whom leaders interact in order to build and act on a shared and evolving vision of enhanced educational experiences for pupils” (p. 109). If leadership is recognized as influence by a group, then the traditional leadership models run counter and support the model of distributed or shared leadership (Harris, 2002c; Leithwood, Jantzi, Steinbach, & Ryan, 1997).

Harris (2002c) argues, “The orthodoxy of school leadership that promotes the ‘cult of the individual’ stubbornly prevails. Fueled by a view of organizational change that is inherently rational, stable and predictable, it reinforces status quo of the leader-follower relationship, creating dependency cultures and an ownership divide” (p. 11). Harris (2002a) pursues a democratic style of leadership for schools. Harris (2002c) declares,

It is easier, far easier, to point the finger of accountability in the direction of one person than to acknowledge that leadership is collective, shared and distributed throughout the organization. To cope with the unprecedented rate of change in education requires establishing new models of leadership that locate power with the many rather than the few. (p. 11)

For Harris, leadership is to be distributed and participative rather than autocratic.

Copeland (2001) claims participative leadership can take the pressure from principals and avoid the formal leader as the solo act. Copeland believes, “Leadership is
embedded in various organizational contexts within the school communities, not centrally vested in a person or an office . . . there is a need to identify and support aspects of leadership beyond the role of the principal” (p. 6).

For Greenfield and Ribbins (1993), leadership starts with the character, and integrity of leaders. Character is inclusive of personal values, moral capability, self-awareness, and emotional capacity. Wasserberg (1999) claims that the “primary role of any leader is the unification of people around key values” (p. 158). This extends the idea of leadership beyond the concept of influence to include personal and professional morals and values. In line with others, DuFour (1998) promotes shared vision and values as one of the most important responsibilities of a leader.

DuFour et al. (2006) deem, “Leaders establish personal credibility far more readily by what they do than by what they say. Expression to strong moral purpose only generates cynicism if the commitment is not manifested through behavior” (pp. 193-194). Fullan (2001) found that the most effective leaders communicate an optimism, confidence, and determination to persevere, which are all contagious characteristics of leaders. Goleman (2002) reckons that passion, energy, enthusiasm and self-efficacy of the leader are contagious, and invigorate people throughout an organization. To paraphrase Drucker (1999), good leaders lead not through knowledge and skills, but through responsibility and integrity (p. 2). Regardless of the quality, a leader who lacks ethics and morality will lead instinctively without any thought, without “soul” (Bolman & Deal, 2002).
Beare, Caldwell, and Millikan (1989) state, “outstanding leaders have a vision of their schools – a mental picture of a preferred future – which is shared with all in the school community “ (p. 99). The research studied by Bennis and Nanus (1985) aided them in identifying ten emerging generalizations about leadership. Four of the ten generalizations related directly to the leader having vision for the organization – (1) have a vision, (2) communicate a vision to attain commitment, (3) communicate meaning of vision, and (4) attend to the vision.

Vision is defined as “an image of a desirable future” (Manasse, 1986; Starratt, 1993 as cited in Abolghasemi, McCormick, & Conners, 1999, p. 1), and it is considered “an essential component of school culture” (Staessens & Vanderberghe, 1994 as cited in Abolghasemi, McCormick, & Conners, 1999, p. 1). The vision emerges from values associated with a school, and it should provide motivation and enthusiasm for all members of the organization (Johnstone, 1987). The vision is the place from which all activities in an organization should start (Lambert, 1988). For Blendinger and Jones (1989), “Vision imbues the culture of a school and school district with a purpose of what is important and valuable. Vision provides direction” (p. 23).

Schwahn and Spady (1998) express various attributes of a visionary leader. Visionary leaders provide “. . . paradigm-breaking imagination and innovation. Also necessary are the ability to: create novel possibilities others don’t see, chart new directions and destinations for their organizations; and thrive on translating shifts and trends into productive options for organizational transformations” (p. 51). For Schwahn and Spady, a defining characteristic as a visionary leader is the “ability to stimulate and
encourage staff and constituents to search out new possibilities that lie beyond their current patterns of thinking and actions because, to be transforming, a vision must be ahead of its organization’s present capacity to operate” (p. 54).


Fullan (1992) elaborates he suggests visionary leaders could possibly harm the organization instead of enhance it. Fullan states, “The current emphasis on vision in leadership can be misleading. Vision can blind leaders in a number of ways” (p. 19). He continues to state, “Principals (leaders) are blinded by their own vision when they feel they must manipulate the teachers and the school culture to conform to it” (p. 19).

In their study, Bolam, McMahon, Pocklington, and Weindling (1993) had trouble finding teachers within the community who could articulate the schools vision; hence, they felt communication of the vision was not conscious and deliberate by the leader. Bolam et al. are hesitant with the ability of leaders to share the vision and to share it effectively with the members of the organization. Differing evidence was previously attained in another study by Greenfield, Licata and Johnson (1992). Within 62 rural
schools, they discovered teachers did have a sense of the vision and were able to articulate it clearly.

If a leader is transformative, he or she is able to pursue a vision with the followers. Sergiovanni (1991) conceptualizes this type of leadership. “In transformative leadership, by contrast, leaders and followers are united in pursuit of higher-level goals that are common to both. Both want to become the best. Both want to shape the school in a new direction” (p.125). Sergiovanni continues, “When transformative leadership is practiced successfully, purposes that might have started out separate become fused” (p. 125).

Similar to Sergiovanni’s collaborative view, Cuban (1988) defines leadership as, “influencing others’ actions in achieving desirable ends. Leaders are people who shape goals, motivations, and actions of others. Frequently they initiate change to reach existing and new goals. Leadership takes much ingenuity, energy and skill” (p. 195). Effective leadership not only benefits the organization, it empowers the involved individuals and allows for personal and professional change. Staratt (2001) perceives leadership as ‘cultivation.’ Staratt clarifies, “By this I mean that democratic leadership is primarily concerned to cultivate an environment that supports participation, sharing of ideas, and the virtues of honesty, openness, flexibility, and compassion” (p. 338).

Gunther (2001) views leadership not as an ‘it’ from which we can abstract behaviors and tasks, but as a relationship. Fullan (2003) endorses the need for “principals who develop leadership in others, thereby strengthening school leadership beyond themselves” (p. 41). Fullan believes moral imperative is a necessary fundamental
characteristic of a leader; however it can only be realized by developing and fostering leadership in others (p. xv).

Kouzes and Posner (2007) have found that individuals can develop the capacity to be a leader. They view leadership as a process where individuals “bring forth the best from themselves and others” (p. xii). Leadership is a process whereby leaders help create options and opportunities, identify choices and solve problems, and build commitment and coalitions by inspiring others working with them to construct a shared vision of the possibilities and promise of a better group, organization, or community (Sashkin & Rosenbach, 1996).

According to Komives, Lucas and McMahon (2007), leadership is a relational and ethical process of people together attempting to accomplish positive change. Kanold (2002) reports that “we have gone through the phases of the principal as administrator and the principal as instructional leader, to a broader and more fundamental notion of the principal as a change agent” (p. 3). The leader takes on the responsibility of acting as the agent who must challenge and transform the culture of the organization.

As a change agent, the leaders must be sincere and encourage followers to take risks. Sungaila (1990) states, “The leader deals in ideology, in formation of a code: What needs to be done, firstly is to change status quo and secondly, to replace it with something else. It is this something else which the leader envisions for his or her followers” (p. 15).

It is important for the leader to allow those who are developing into leaders to venture towards new entities, and possibly experience failure when building leadership
capacity and empowering others. Bass (1998) realizes that in order to delegate effectively the follower will most likely make mistakes before he or she reaches proficiency of the task. For Bass, “It is the transformational leader who fosters empowered followers” (p. 145). However, Goleman (2002) notes that relationships between leaders and followers can be maintained only if the leader is inspiring, influential, nurturing, and a catalyst for change.

Avolio (1997) comments, “Over the last decade, we witnessed a fundamental change in the leadership systems in organizations, that has virtually redefined the relationship between leaders and followers. The transformation in leadership has paralleled a move away from authoritarian towards a more collaborative leadership style” (p. 1). According to Spillane, Diamond, and Jita (2003), “Leadership expertise extends beyond the mind of an individual leader. Studying leadership as a distributed practice also involves exploring leadership practices” (p. 538). Also Spillane et al. believe, “Understanding how leaders in a school work together, as well as separately, to execute leadership functions and tasks is an important aspect of leadership distribution” (p. 538).

Beare, Caldwell, and Millika (1989) concur that “Outstanding leadership has invariably emerged as a key characteristic of outstanding schools. There can no longer be doubt that those seeking quality in education must ensure its presence and that development of potential leaders must be given high priority” (p. 99). An effective leader needs to be a change agent, to promote a shared vision, to inspire others, to provide opportunities for others to act, to establish standards and follow them, and to lead from the heart. Fullan (1998) states that “instead of looking for saviors we should be calling
for leadership that will challenge us to face problems for which there are no simple painless solutions” (p. 8). While Kanold (2002) found that “energetic-enthusiastic-hopeful leaders ‘cause’ greater moral purpose in themselves, bury themselves in change, naturally build relationships and knowledge, and seek coherence to consolidate moral purpose” (p. 51). All stakeholders must know and understand the vision for this greater purpose.

In order to inspire others and encourage them to create a shared vision, Fullan (1998) believes effective leaders must be able to show others the way to create a shared vision. According to DuFour and Eaker (1998), effective communication from the leader and followers sets the foundation of a learning community. These communities are collaborative environments where learning is continuous because they have established shared understandings, along with common values and beliefs.

Numerous school leaders are on a quest to improve organizational behavior by relying on the leadership potential of all members of the school community. Gabriel (2005) believes, “This trend is a shift from relying on the power of the system to seeking to empower others” (p. 1), or more specifically, for Caine and Caine (2000) the trend is “a shift from seeking to be in control to letting go of control and building a community of relationships that tends to be self-organizing” (p. 8).

The foremost model that incorporates these behaviors is transformational leadership. For Bass (1998), “It is the transformational leader who fosters empowered followers” (p. 145). While the study performed by National Association of Elementary School Principals (NAESP) in 2002 revealed that “responsibility for leadership must be
distributed” (p. 12). Kanold adds (2002), “Developing people to their full capacity, in order to seize the opportunity to equalize education for the next generation of students, will not be served by an industrial revolution model. A hierarchical top-down management style will no longer be a reasonable choice. Teams of teachers should be empowered in the decision-making process” (p. 41). Kanold includes, “The leadership challenge will be the creation of community of commitment to the shared decision making by using a flattened leadership structure in order to create a community of commitment to shared educational values” (p. 41).

Gunter (2001) conceives leadership as a pedagogic relationship and an activity. As the discussion on leadership in education has been expanded to include these two components, a variety of leadership styles has been proposed as a means to increase student learning, to focus on school improvement, to enhance the culture, and to build collective ownership in programs and philosophies. The leadership styles that are essential to these means are transactional leadership, transformational leadership, teacher leadership, and distributed leadership.

**Leadership and Organizational Culture**

Demographic and cultural shifts, social changes, and rising public and policy expectations indicate a need for effective school leadership. Over decades, leadership in education has been viewed as a collection of a few people from various parts of the organization. These individuals have worked collectively to enhance an organization, but the ownership of leadership has not been collective. The paradigm of leadership within
schools has shifted from authoritative to democratic. Instead of placing leadership in the hands of a few individuals in an organization, leadership is now a systemic characteristic.

According to Ogawa and Bossert (1995), leadership is an organizational quality that makes teacher-leaders an essential component of understanding the practice of leadership (Spillane, Halverson & Diamond, 2004; Leithwood et al., 1997) as well as the culture of the organization. As learning communities within schools are established and as leadership is distributed throughout an organization teachers become empowered as leaders. Ogawa and Bossert (1995) note that, “Leadership flows through the networks of roles that compromise organizations. The medium of leadership and the currency of leadership lie in the personal resources of people” (p. 225). Ogawa and Bossert add, “And, leadership shapes the systems that produce patterns of interaction and the meanings that other participants attach to organizational events” (p. 225).

Over time, an organization’s culture is formed around the beliefs of the people who compose the organization. They form this culture based on what the members believe works and does not work. There are two themes in defining organizational culture: norms and assumptions. According to Owens (2001), norms are defined by the people and become established rules of behavior for the people while assumptions are what the people of an organization believe to be true or false in the world. Leithwood and Jantzi (1998) acknowledge, “The contribution of culture to school effectiveness depends on the content of norms, values, beliefs and assumptions. It also depends on the extent to which they are shared, and whether they foster collaborative work” (p. 10).
Deal and Patterson (1999) observe, “A strong culture produces dense leadership. As teachers and parents become leaders, the school becomes an institution with history, values, purpose and pride” (p. 41). An effective leader is able to construct a culture that positively influences teachers, who, in turn, positively influence students (Marzano, Waters & McNulty, 2005). Leithwood and Riehl (2003) believe that, “Leaders act through and with other people. Leaders sometimes do things, through words or actions, that have a direct effect on the primary goals of the collective, but more often their agency consists of influencing the thoughts and actions of other persons and establishing policies that enable others to be effective” (p. 8).

Bush and Harris (1999) have noted an increased emphasis upon the associations between leadership and culture of an organization. They believe education is moving away from the notion of leadership as a string of transactions within a cultural context but towards a view of transformational leadership, having the possibility of altering the cultural context of the organization. They acknowledge that, with time, the culture of an organization can transform the organization.

**Leadership and Organizational Change**

An important task of leadership is “to make sure that the organization knows itself” (Wheatley, 1999, p.156). If schools distribute leadership, it will call upon every educator to redefine his or her role and responsibilities in the organization (DuFour et al., 2006). Marzano, Waters, and McNulty (2005) make a distinction between first-order change and second-order change. First-order change is incremental change, representing small changes which do not deviate from the past or the current path. These changes do
not involve redefining the roles or responsibilities of the staff. Second-order change is “deep change” because there is a “dramatic departure from the expected, both in defining a given problem and in finding a solution” (p. 66). Since second-order change is inconsistent with the existing paradigm of educational leadership, it insists upon new knowledge and new skills. According to DuFour et al. (2006), “the goal of second-order change is to modify the very culture of the organization and the assumptions, expectations, habits, roles, relationships, and norms that make up the culture” (p. 186). Transformations within schools require a second-order change, an extensive change, a real change.

Major changes do not often arise from the individuals at the bottom of the hierarchal structure of an organization (Evans, 1996) nor do they arise in a ‘top down’ climate. For the culture of an organization to be changed, sustained efforts and attention of the school and district leaders are required (DuFour et al., 2006). Reflecting upon school change, Sarason (1996) deduced, “Changing the school culture is conceptually and practically a bewildering, complex affair” (p. 339). Through extensive research on principals, Marzano et al. (2005) discovered principals establish the emotional climate for the school. It is the principal’s responsibility to portray “a positive attitude about the ability of the staff to accomplish substantive things” (p. 56).

The progression of the role of educational leadership reflects a second order change (Leithwood, 1994) because it is attempting to change the structure of an organization. Transformational leadership is the most commonly used model of leadership used to make a second order change in an organization (Bass, 1985, 1997;
Hallinger, 2003; Leithwood & Jantzi, 2000b; Silins & Mulford, 2002). Leaders who are transformational will have the ability to increase the capacity of individuals in the organization to yield first order changes related to student learning (Lambert, 1998; Leithwood & Louis, 1999). Transformational leaders will establish an environment where teachers are part of professional learning communities, and continuous learning is essential for teachers such that teachers engage in professional dialogues where they share their experiences and learning with others.

Both Barth (1990) and Lambert (2002a) believe transformational leaders need to work with individuals in the community to establish goals that connect to the goals of the organization. If this connection occurs, commitment among staff members will increase, because they will make the association between what they are trying to attain and the goals of the organization (Hallinger, 2003). A second-order change occurs as a result of the principal or transformational leader, establishing the environment for individuals to become committed and motivated to work towards organizational improvement.

Scribner, Cockrell, Cockrell, and Valentine (1999) maintain that leaders (building principals) cannot do much to affect student achievement directly, but rather that an effective culture is a primary instrument by which a leader can make changes in an organization. Hanson (2001) explains, “Schools have their own unique cultures that are shaped around a particular combination of values, beliefs, and feelings. These school cultures emphasize what is of paramount importance to them as they strive to develop their knowledge basis in a particular direction. . .” (p. 641). Hanson continues,
“Although the culture of a school is not visible to the human eye, its artifacts and symbols reflect specific cultural priorities” (p. 641).

**Transactional Leadership**

In the late 1970s, Burns (1978) identified two models of leadership, transactional and transformational. Stone (1992) remarks, “The effects of transformational and transactional leadership in organizations suggest that each is important for particular outcomes” (p. 1). Northouse (1997) states, “Transformational leadership is the favored style of leadership given that it is assumed to produce greater results in expected outcomes than does transactional leadership. While transactional leadership results in expected outcomes, transformational leadership results in performance that goes well beyond what is expected” (p. 137).

Miller and Miller (2001) explain that, “Transactional leadership is leadership in which relationships with teachers are based upon exchange for some valued resource. To the teacher, interaction . . . is usually episodic, short-lived and limited to the exchange transaction” (p. 182). Miller and Miller believe, “Transformational leadership is more potent and complex and occurs when one or more teachers engage with others in such a way that administrators and teachers raise one another to higher levels of commitment and dedication, motivation and morality. Through the transforming process, the motives of the leader and follower merge” (p. 182).

According to Burns (1978), the basis for transactional leadership involves contact initiated by one person in order to exchange something of value with another person. Each person is aware of the influence, resources, and standpoint of the other.
Transactional leadership is seen as a series of exchanges between individuals in order to attain a specific goal. Daft (1999) describes the relationship between the leader and follower stating, “the transactional leader recognizes specific follower desires and provides goods that meet those desires in exchange for followers meeting specified objectives or performing specific duties” (p. 427). Burns (1978) recognizes that transactional leadership is observed by “values of means – honesty, responsibility, fairness, the honoring of commitment,” and believing that without these values, leadership would not succeed (p. 426).

Hollander (1978) claims transactional leadership is a social exchange where the leader and the follower give and receive benefits. The exchange preserves the leadership relationship as well as preserving the potential for the leader to influence the followers and also the leader to be influenced by the followers (p. 38). Griffin (2003) describes a skillful transactional leader as “…likely to be effective in stable, predictable environments where charting activity against prior performance is the most successful strategy. This leader’s prototype was consistent with an equitable leader-member exchange relationship where the leader fulfilled the needs of followers in exchange for performance meeting basic expectations” (p. 4).

Transactional leadership is reflective of rewards and punishment for efforts put forth by the followers. Daft (1999) offers, “Thus, followers receive rewards for job performance while leaders benefit from the completion of tasks” (p. 427). Bass (1985) examined transactional leadership from a reinforcement perspective. His focus was on reward and punishment. With transactional leadership, Bass claimed that both leaders
and followers comprehend rewards are given for successful completion of a task and punishment is acceptable when tasks are not completed or completed incorrectly. Personal satisfaction and motivation increases when extrinsic rewards are presented to followers. Punishment or fear of punishment is used to control the behavior, and transactional leaders tend to only emphasize the negative when there is a need for punishment (Bass, 1985). According to Bass, this inconsistency with punishment is seen as the main weakness of transactional leadership.

Avolio (1997) defines transactional leadership when he says, “Moving down the range, we come to the more transactional and non-transactional forms of leadership, while again, our focus is still on the individual” (p. 12). Transactional leadership focuses on individual accomplishments not accomplishments attained through collective responsibility. Avolio continues, “The transactional form represents articulation of standards, expectations, goals, and in many cases the rewards an individual receives from achieving goals. In its more corrective form, transactional leadership can be observed where standards are set “of what not to do,” and the contingent consequences when errors are made” (p. 12). The transactional leader answers the selfishness of the followers instead of challenging the followers to move beyond their own self-centeredness.

Conger and Kanungo (1998) highlight how Burns (1978) differentiates between transactional and transformational leadership. They state, “For Burns the difference between transformational and transactional leadership is in terms of what leaders and followers offer one another. Transformational leaders offer a purpose that transcends short-term goals and focuses on higher order intrinsic needs. Transactional leaders, in
contrast, focus on the proper exchange of resource.” Conger and Kanungo (1998) carry on, “To Burns, transactional leadership is more commonplace than transformational leadership, if less dramatic in its consequences” (p. 755). Transactional leaders are managers who organize and plan efficiently. They can maintain budgets, plan events, set expectations, organize the followers, and focus on the tasks. Avolio (1999) connects transactional leadership to the culture by stating, “And as a culture, this style of leadership creates an environment that is often risk averse and quite low in innovation” (p. 37). Like Avolio, Daft (1999) recognized that transactional leaders could be effective because they focus on maintaining stability, but also they are ineffective because transactional leaders do not promote or initiate change.

**Transformational Leadership**

Although transactional leadership behaviors serve as the foundation for transformational leadership, it still remains in opposition with transformational leadership since transformational leadership works to transform or change organizations. Transformational leadership emerged in the late 1970s and early 1980s because organizations needed to change how they were leading their followers, and there was a need to change the system. It was not until the 1990s, however, that the educational community embraced the idea of transformational leadership.

Burns (1978) defines transformational leadership as “the development of a relationship of mutual needs, aspirations, and values in which the leader looks for potential motives in followers, seeks to satisfy higher needs and engages the full person of the follower” (p. 4). Burns portrays transformational leaders as individuals who have
the ability to work collaboratively together such that both leaders and followers motivate each other and raise each other to higher levels of morality. The focus of the transformational leader is on the individual development of the followers by improving their performance, ultimately allowing the organization to grow. Hallinger (1992) views the goal of transformational leadership to be improvement of the organizational performance by focusing on problem solving and collaboration amongst the stakeholders. Yukl (1994) states, “transformational leadership refers to the process of building commitment to the organization’s objectives and empowering followers to accomplish these objectives” (p. 350).

Avolio (1999) describes transformational leadership as “. . . the process whereby leaders develop followers into leaders. This is a conscious goal; the leader has a development plan in his or her head about each follower. Transformational leadership is fundamentally morally uplifting” (p. 34). Lucas (1994) characterizes transformational leaders as individuals who “create a shared vision, energize others by communicating that vision at many levels, stimulate others to think in different ways and to excel, give individual consideration to others, and provide an organizational climate that helps others to accomplish activities of value and feel appreciated” (p. 47). According to Leithwood and Jantzi (1999), transformational leadership is a form of leadership that attempts to help others understand the problems that confront them. The transformational leader seeks to improve the environment and culture by attempting to “integrate the multiple dimensions and requirements of leadership – the cognitive, emotional and behavioral” (Gill, 2003, pp. 310-311).
Bass and Avolio (1994) identified four characteristics of transformational leadership which Leithwood deemed as necessary for school leaders. The characteristics are as follows: individualized consideration, inspirational motivation, intellectual stimulation, and idealized influence. These four characteristics clearly delineate the transformational leader from the transactional leader.

Inspirational motivation was described by Bass (1985) as the leader sharing his or her expectations for the followers; in schools, the followers would be the teachers and students. The leader is able to acknowledge the importance of the followers to the overall organization. Silins (1992) views inspirational motivation as, “The degree to which the leader creates enthusiasm in followers, sees what is really important, and transmits a sense of mission to the organization” (p. 318).

The second characteristic of transformational leadership is idealized influence or charisma. The transformational leader must model behavior for the followers through personal accomplishments and verified character. Northouse (1997) explains, “Strong role models for followers; followers identify with these leaders and want very much to emulate them. In essence, the charisma factor describes individuals who are special and who make others want to follow the vision they put forward” (p. 135).

The third constituent of transformational leadership is intellectual stimulation. The transformational leader who exemplifies intellectual stimulation is able to help followers see ‘old things’ in a new way. According to Bass (1985), a shift of thinking occurs when followers respond to the intellectual stimulation of a leader. “By the transformational leader’s intellectual stimulation, we mean the arousal and change in the
followers of problem awareness and problem solving, of thought and imagination, and of beliefs and values, rather than arousal and change in immediate action” (p. 99). For Northouse (1997), intellectual stimulation is expressed as, “Leadership that stimulates followers to be creative and innovative, and to challenge their own beliefs and values as well as those of the leader and organization” (p. 136).

The final characteristic of transformational leadership is individualized consideration. The leader focuses on the needs of and provides attention to individual members of the organization. Bass (1985) remarks, “generally, individualized consideration has been found to contribute to subordinate satisfaction with the leader and in many circumstances to subordinates productivity” (p. 82). According to Bass, transformational leaders “. . . tended to be friendly, informal, and close and treated their subordinates as equals although they had more expertise. They gave advice, help and support and encouraged their subordinates’ self-development” (p. 82). Northouse (1997) characterizes individualized consideration as “Leaders who provide a supportive climate in which they listen carefully to the individual needs of followers. Leaders act as coaches and advisors while trying to assist individuals in becoming fully actualized” (p. 137).

Leithwood and Jantzi (1990) identify the goals of transformational leadership to be as follows: (1) encourage and support staff in developing and sustaining a collaborative and professional school culture, (2) foster teacher development, and (3) assist teachers in solving problems more effectively. Transformational leaders will involve teachers in goal setting and reduce isolation while imposing bureaucratic systems to change the culture. Leithwood (1994) features ‘people effects’ as the foundation for
transformational leadership. When the transformational model is embraced, leadership is shared amongst teachers and principals (Leithwood & Jantzi, 2000a; Louis & Marks, 1998; Ogawa & Bossert, 1995) – leadership is distributed to individuals. The transformational leadership model wants to influence people; hence it builds from the ‘bottom up’ rather than the ‘top down’ (Hallinger, 2003).

Figure 1. Transformational Leadership Model

![Transformational Leadership Model](image)

(Leithwood, Leonard & Sharratt, 1998)

The transformational model in Figure 1 reflects the ability of leadership to establish a foundation grounded in the desires of the individuals – the teachers – of the organization rather than attempting to ‘coordinate and control’ the individuals based upon the wishes of the organization. With transformational leadership, change is stimulated by ‘bottom up’ contributions (Day, Harris & Hadfield, 2001; Jackson, 2000; Marks & Pinty, 2003). Within schools, instructional leadership that is more transactional produces ‘first order’ change, but transformational leadership generates ‘second order’ change, change
that increases the capacity of other members of the organization. The transformational leader works at producing changes in people rather than advancing exclusive instructional practices (Bottery, 2001; Hallinger, 2003; Leithwood & Jantzi, 1999b; Mulford & Bishop, 1997).

According to DesGriffin (2003),

Transformational leaders seek new ways of working, seek opportunities in the face of risk, prefer effective to efficient answers and are less likely to support status quo. They may use transactional strategies when appropriate but tend to use symbolism and imagery to solicit increased effort by raising the level of intellectual awareness about the importance of valued outcomes, by raising or expanding individual needs and by inducing a belief in transcending self-interest for the sake of the team or organization. (p. 4)

Silins (1994) concluded, “Transformational leadership characteristics (not transactional) are associated with school improvement. Leader behaviors such as establishing a shared purpose, mission, a commitment to change and improved performance as well as commitment to a cohesive set of values, is a substantial effect on the major purpose of schooling – improving students performance outcomes” (p. 8).

According to Hallinger (2003), transformational leadership was embraced by educators because inadequacies exist with the instructional leadership model. Hallinger states,

Transformational leadership focuses on developing the organization’s capacity to innovate. Rather than focusing specifically on direct coordination, control, and supervision of curriculum and instruction, transformational leadership seeks to build the organization’s capacity to select its purposes and to support the development of changes to practices of teaching and learning. (p. 330)
Transformational leadership in education rests on its ability to empower and develop teachers while enhancing and/or changing the culture of the organization. Alger (2008) states, “Transformational leadership is a desirable style for school leaders involved in improvement efforts because it raises the level of awareness of workers so that they come to value organizational goals and strategies to achieve those objectives” (p. 1). Burns (1978) demonstrated that transformational leaders have the ability to bring about novelties for an organization as well as change. According to Hallinger (2003), “Transformational leadership focuses on developing the organization’s capacity to innovate” (p. 330). It is the transformational leader who changes the organizational culture by establishing new ideologies and by redefining the responsibilities of members of the organization. Hallinger echoes others when he states, “Transformational leadership may be viewed as distributed in that it focuses in developing a shared vision and shared commitment to school change” (p. 330).

Bogler (2001), Day et al. (2001) and Fullan (2002) conclude that transformational leadership impacts the perceptions of school conditions by teachers, the commitment of teachers to change, and the learning that takes place in the organization. These conclusions relate to two characteristics of transformational leadership: (a) its ability to be distributed and (b) its intention to build leadership capacity within the organization (Hallinger, 2003). According to Chirichello (1999), transformational leaders can build capacity for change, and initiate and support new standards for organizations. Chirichello’s study concludes, “. . . transformational leaders will embrace teachers as leaders, encourage reflective study and professional development, and will provide
regularly scheduled times for collegial activities including professional development, reflective study and collective governance” (p. 7). While Hallinger (2003) believes the shared or distributed leadership model is “opportunistic, flexible, responsive and context-specific, rather than prescribed by roles, inflexible, hierarchical and status-driven” (p. 339).

Day et al. (2001) suggests leaders should be both transactional and transformational. The transactional component guarantees that “systems were maintained and met and that their schools ran smoothly” while the transformative approach allows “building on esteem, competence, autonomy and achievement” (p. 47). Fullan (2001) would agree with Day et al. (2001) on the need for valuable leaders to possess both types of leadership. Fullan (2001) states, “I have never been fond of distinguishing between leadership and management: they overlap and you need both qualities. But here is one difference that is makes sense to highlight: leadership is needed for problems that do not have easy answers” (p. 2). Leithwood and Jantzi (1998) believe transformational leadership is defective because it underemphasizes the needs for leaders to also be transactional since transactional practices are essential to the stability of the organization.

Day, Harris and Hadfield (2000) acknowledge challenges to being a transformational leader by asserting, “Among the tensions that make transformational leadership a challenge are struggling to find balance among: development versus maintenance, internal versus external change, autocracy versus autonomy, personal time versus professional tasks, and personal values versus institutional imperatives” (p. 57). Transformational leaders attempt to model the effective behaviors but also teach these
characteristics to aspiring leaders. Since this belief is essential to the transformational model, then it stands to reason if the behaviors of the leader can be assessed then any shortcomings of the leaders can be acknowledged and improved upon by the leader (Avolio & Bass, 2004). Hence, it is essential for leaders to be made aware of the leadership behaviors they employ in order for them to have the opportunity to change or enhance their leadership behaviors. However, Bennis (2004) noted “we still don’t know which leadership programs work to change leadership styles or abilities” (p. 35).

**Interdependence of Transactional and Transformational Leadership**

Avolio (1999) describes transactional leadership as the “starting point” towards transformational leadership. He connects the two types of leadership. To an extent, transformational leaders make use of transactional practices, but those transformational leaders who do employ transactional behaviors are doing so to transform the organization and move it forward (p. 35). Bass (1985) states, “The best leaders are both transformational and transactional” (p. 21). The findings from a study done by Barnett et al., (1999) support the concept of an interdependence of transformational and transactional characteristics.

As Bass (1985) was highlighting discrepancies between his thinking and the thoughts of Burns, he claimed the following: “He sees transformational leadership as the opposite end of a single continuum from transactional leadership. Conceptually and empirically, we find that leaders will exhibit a variety of patterns of transformational and transactional leadership. Most leaders do both but in different amounts” (p. 22). Similar to Bass’ beliefs, Howell and Avolio (1993) believe that transformational leadership is
complimentary to transactional leadership, yet effective leaders supplement transformational behaviors for transactional (p. 756).

Transactional leadership is the foundation for transformational leadership. Bass (1998) contended, “transactional leadership does not substitute for transactional leadership. The very term augmentation, meaning amplification or extension, suggests there is something to amplify or extend” (p. 21.) According to Avolio (1999), “Transactions are at the base of transformations” (p. 37). Avolio clarifies why transactions are the foundation for transformational leadership by stating, “…if you honor all your various transactions with people, over time they come to trust you; and it is higher levels of trust versus compliance that transformational leadership uses as its base for achieving exemplary performance” (p. 37). Avolio continues, “Transactional leadership is not enough for people to achieve their full potential, whether they are leaders or followers, individuals or in groups” (p. 37).

For Harris (2002b), “the prevailing orthodoxy of leadership is predominantly managerialist in orientation, clustered around post or position and chiefly concerned with outcomes rather than process” (p. 332). If schools are to focus on the process then the leaders need to move away from being primarily transactional in their actions.

Day et al. (2000) acknowledges the pressures on administrators who aim to be transformational leaders. Day et al. state, “Leadership is essentially building and maintaining a sense of vision, culture, and interpersonal relationships, whereas management is coordinating, supporting, and monitoring organizational activities. To perform both roles requires a careful balancing act” (p. 57). In response to her study on
transformational leadership in Hong Kong schools, Cheng (1997) states, “We need transformational leadership to face educational challenges and pursue long-term multiple effectiveness in primary and secondary schools” (p. 6). Cheng continues, “The traditional transactional leadership based on the exchange theory is clearly not sufficient to lead our schools to pursue school effectiveness and educational quality” (p. 21). In her work, Cheng acknowledges the difficulties in shifting from being a transactional leader to being a transformational leader.

Silins (1994) studied the roles of leadership characteristics that make a difference in Australian schools. Silins discovered that, “Transformational leadership characteristics are associated with school improvement. Leader behaviors such as establishing a shared purpose, mission, a commitment to change and improved performance, as well as a commitment to a cohesive set of values, is a substantial effect on the major purpose of schooling – improving student performance outcomes” (p. 8). In addition, Silins found that, “. . . teachers do not perceive transactional leadership as a factor in school change. A leader who is task focused and policy driven, approaches change independently of followers’ concerns and needs, and strives for administrative efficiency is not perceived as contributing to school improvement in student performance, school curriculum, teacher outcomes or school ethos” (p. 7). Silins continues, “Less surprisingly, a transactional leader who is passive and concentrates on maintaining the status quo is also perceived as inconsequential to school improvement” (p. 7).


Teacher Leadership

Danielson (2006) asserts, “Teacher leadership is an idea whose time has definitely arrived” (p. 27). Contributing to the belief that there is a need for a transformation in schools, Buchen (2000) argues that “the only leadership that will make a difference is that of teachers. They alone are positioned where all the fulcrums are for change. They alone know what the day-to-day problems are and what it takes to solve them . . . They know what is needed” (p. 2). In agreement with Buchen’s ideology on teacher leaders is Reeves (2008). In a study performed by Reeves, he concluded that not only do teachers exercise a considerable impact on the performance of students, but they also impact the performance of their peers.

Governmental stipulations and high-stakes testing have caused numerous school leaders to seek “more effective organizational behavior by drawing on the leadership potential of all stakeholders, especially teachers” (Gabriel, 2005, p. 1). Teacher leadership is either an informal or formal leadership role held by a teacher; it is often voluntary, and it represents the highest level of professionalism. According to Danielson (2006) teacher leadership is defined as “a set of skills demonstrated by teachers who continue to teach students but also have an influence that extends beyond their own classrooms to others within their own school and elsewhere” (p. 12). There is no gain in authority for the teacher; however the teacher leader can earn it by demonstrating their work with both students and colleagues. Teacher leaders are intrinsically motivated by the students they serve, and they activate and invigorate their colleagues to improve the school’s performance in terms of teaching and learning.
Teacher leaders work to develop collaboration with their colleagues (Danielson, 2006). A teacher leader is one who shares knowledge and wisdom concerning professional practices and has a substantial effect within the school community in the areas of curriculum and instruction, school decisions, and school innovation and improvement (Horejs, 1996). Wasley (1991) states a teacher leader has the “ability to encourage colleagues to change, to do things they wouldn’t ordinarily consider without the influence of the teacher leader” (p. 10).

Childs-Bowen, Moller, and Schrivner (2000) proposed that “teachers are leaders when they function in professional learning communities to affect student learning; contribute to school improvement; inspire excellence in practice; and empower stakeholders to participate in educational improvement” (p. 28). Teacher leaders can impact school culture, build and maintain a profitable team or teams, and prepare other prospective teacher leaders to improve and increase student achievement (Gabriel, 2005). Teacher leadership provides schools with a more collective form of leadership that begins to build a systematic, characteristic, organic management (Miller & Rowan, 2006).

Murphy (1994) recognizes how important it is for teacher leaders to participate in shaping the school vision. If leadership capacity among the teachers in a school is established, such that teachers work collectively on the school vision, not only will they impact each other and their students but their productivity throughout the organization will be enhanced greatly. According to Leithwood (2004), “all transformational approaches to leadership emphasize emotions and values and share in the common fundamental aim of fostering capacity development and higher levels of personal
commitment to organizational goals on the part of leaders’ colleagues.” He continues by stating, “Increased capacities and commitment are assumed to result in extra effort and greater productivity” (p. 2).

Leadership capacity is an organizational concept of leadership referring to broad-based, competent participation in the work of leadership (Lambert, 1998). By building leadership capacity in an organization, the dependency on the individual leaders decreases, while the staff is empowered to sustain the culture despite changes in leadership. It is the key leaders of an organization who assume the responsibilities for developing and building leadership capacity. In his research, Collins (2001) discovered that organizations imposing the model of one brilliant leader tended to be ineffective, while the leaders of effective organizations created powerful teams early on to enhance the improvement efforts (p. 41).

Hopkins (2001) views teacher leadership as an inevitable strength for school reform. A substantial amount of literature has called attention to the fact that teacher leadership is crucial to school reform, especially if it is to be successful reform (Center for Comprehensive School Reform and Improvement, 2005; Conley & Muncey, 1999; Kinney, 2008; Lambert, 2005; Lieberman & Miller, 2004). A task force report from the School Leadership for the 21st Century Initiative (2001) contends that teachers are vital for school reform, and they control the essence of knowledge yet to be taken advantage of in the field of education.

Schools are under extreme pressure to ascertain positive results from all students. They are expected to close the achievement gap, and principals cannot do this on their
own. As Katzenmeyer and Mollen (2001) express, “When given opportunities to lead, teachers can influence school reform efforts. Waking this sleeping giant of teacher leadership has unlimited potential in making a real difference in the pace and depth of school change (p. 102).

Teacher leadership can be seen in all facets of the organization. Danielson (2006) divides teacher leadership into three areas: (1) schoolwide policies and programs, (2) teaching and learning, and (3) communications and community relations. Danielson also acknowledges the occurrence of teacher leadership in different settings – instructional or learning team, department, school-wide effort, district-wide effort, state or even national. She recognizes that no setting is more prevalent than the other, but instead, they should be viewed as different locations of work.

Teacher leaders can surface from a variety of means. The teacher leader can be opportunistic, emerging due to a mandate or new requirement placed on a school, or can see a need him or herself and thus the emergence of a task is the initiative of the teacher. According to Danielson (2006), “. . . what began as a spontaneous exercise of teacher leadership may metamorphose into a more formal role” (p. 24).

As stated by Conley (1993), and Conley, Schmidle and Shedd (1988) within the research of Zinn (1997), teachers are becoming involved in decision-making and leadership in schools which reflects the commonality of both formal and informal leadership roles for teachers. Although many schools are building leadership capacity among teachers, the leadership behaviors of these teacher leaders has not been investigated sufficiently. According to Reeves (2008), teacher leadership is not about
positional authority but about the ability to influence the professional practices of other teachers. The formal teacher leaders usually are the teachers working to build leadership capacity in departments, on teams, or within the school.

Formal teacher leader positions are those which have been instituted by the administration of the school where teachers assume formalized positions as master teacher, department chair, mentor, or team leader. Danielson (2006) asserts the primary creation of these formalized roles was to establish a democratic society within the organization, to distribute the work to others beyond the principals, and to allow teachers to act as allies as they work towards the school improvement initiatives.

Many teachers view formalized teacher leadership as an extension of the administration which limits the concepts of shared-decision making and distributed leadership within the context of teacher leadership. More often than not, formalized leaders are appointed decreasing the level of trust by other teachers who believe it is actually the administration doing the sharing and distributing rather than the formalized teacher leader (Danielson, 2006).

Informal teacher leaders are those individuals who serve in a leadership position but do not hold a title. Notably, Gabriel (2005) states, “In any kind of organization, informal leaders command a great deal of respect; they have much say and sway in determining a team’s climate or the chances of a proposal’s adoption, and they are often sought after for advice” (p. 3). Informal teacher leader roles can change frequently, but it does not diminish the necessity for leadership in order to attain success.
Collective or distributed leadership implies a blending of leaders and followers that would alter the dynamics of power within schools, possibly change the division of labors within schools, and finally allow teachers to become leaders at various times. Teacher leadership becomes a form of distributed leadership practice (Harris, 2002b).

Shared or distributed leadership amongst teachers “does not occur easily, and many studies suggest considerable reluctance among teachers to participate in leading” (Bishop & Mulford, 1996; Sheppard & Brown, 1996 as cited in Hallinger, 2003, p. 341). Hallinger’s study (2003) suggests “strong transformational leadership by the principal is essential in supporting the commitment of teachers. Because teachers themselves can be barriers to the development of teacher leadership, transformational principals are needed to invite teachers to share leadership functions” (p. 343). If transformational principals are essential to developing teacher leaders, then leaders at the middle level – department chairs – may be influenced by this type of leadership, thus aiding in the development of transformational teacher leaders. Sheppard (1996) states, “When teachers perceive principals’ instructional leadership behaviors to be appropriate, they grow in commitment, professional involvement, and willingness to innovate” (p. 345).

Danielson (2006) states, “The concept of teacher leadership recognizes the daunting challenges confronting schools of the 21st century and the need for schools, as organizations, to meet those challenges through innovative structures” (p. 27). She continues by sharing, “. . . the strict bureaucratic hierarchy is not sufficient, nor are other approaches that place teachers in the role of receiver of accepted wisdom. Rather, to
bring the best to bear on the challenges of education, the engagement of teacher leaders in the enterprise is an important component of any improvement strategy” (p. 27).

Gabriel (2005) clearly conveys why a teacher would want to be a leader when he offers, “Most people want to feel they are a part of something significant, that what they do matters, and that they are contributing members to a common goal that affects achievement” (p. 20). For teachers who wish to remain primarily teachers, but who have skills and ideas to expand their work, and who want a larger voice, teacher leadership provides these individuals the opportunity.

Lastly, Spillane, Diamond and Jita (2003) believe, “The focus in the literature is on the work of those occupying formal and informal roles rather than the composite of leadership practice in a school means that understandings of school-leadership practice are not comprehensive” (p. 535). They argue, “In order to understand school leadership, it is necessary not only to understand the practice of each of those who lead, but also to understand the relations among these leading practices” (p. 535).

**Distributed Leadership**

The suggestion that leadership roles are not limited to individuals is nearly 60 years old (Pounder, Ogawa, & Admons, 1995). Ogawa and Bossert (1995) argue that leadership is an occurrence for the entire organization not necessarily only principals and teachers. Heller and Firestone (1995) acknowledge the fact that others play important roles in leading instruction, and they find it problematic that the other sources of leadership within a community often are unseen. Spillane, Halverson and Diamond (2001) make a case for school leadership. Leadership is not the role of an individual, but
rather it represents the interactions between various leaders and followers, and their situation around a specific task.

Hallinger and Heck (1996) suggest it is idiotic to believe principals are the only individuals capable of imparting leadership to improve the school. They make a compelling argument towards the distribution of leadership and away from the role-based model of leadership. Elmore (2000) believes the current models of leadership adopted by schools are not capable of generating instructional improvement and increasing student achievement. Harris (2002c) supports Elmore’s claim on current leadership models by sharing, “Leadership models have evolved to control organizational functions rather than to improve teaching and learning . . . the skills and knowledge that shape leadership practice have not directly focused upon the improvement of instruction and student performance” (p. 2).

Gronn (1996) declares, “leadership is seen as something performed by superior better individuals (invariably aging white males) rather than groups, located in top positions, and as something do to or for other inferior, lesser people” (p. 12). Gronn contests what he calls “barren models of followership” (p. 12). He argues, often leadership is associated with the aging white male having too much power and superiority resulting in individuals or a small group of individuals being labeled as better than the rest. In contrast, Gronn believes leadership should stem from groups. Gronn (2000) suggests that “distributed leadership is an idea whose time has come” (p. 333). The distributed view of leadership requires schools to “de-center” the leader (Gronn, 2002).
Distributed leadership is rooted in the philosophy of change and the ability to sustain it (Fullan, 2001). The leadership of the organization must create changes that teachers can embrace and own because, ultimately, teachers are the ones who will be implementing the changes in their classrooms (Fullan, 2006; Hall & Hord, 2001). Since transformational leadership represents shared leadership, there is an increased interest in how leadership is shared or “distributed” within an organization amongst administrators, teachers, and parents (Gronn, 2002; Leithwood, Mascall, & Strauss, 2009; Spillane, 2006).

Gronn (2000) believes distributed leadership implies a blending of leaders and followers capable of altering the activity of power within organizations, a changing of the divisions of labor, and an opportunity for teachers to become leaders at different times. Of the same mind is Goleman (2002) who contests that “Leadership resides not solely in the individual at the top, but in every person at entry level who in one way or another acts as leader” (p. 14). Harris (2001, 2002c) shares Gronn’s views, and feels there needs to be a reconceptualization of leadership such that it is distributed throughout the organization rather than contained among particular individuals.

Harris (2002c) acknowledges teacher leadership as putting distributed leadership into practice. Distributed leadership for Harris “implies (1) a different power relationship within the school, where distinctions between leaders and followers tend to blur; (2) it has implications for the division of labor within a school, the tasks facing the organization are shared; (3) opens the possibility of all teachers becoming leaders at various times” (p. 335).
Wenger (1998) suggests that “individuals derive their understanding of their work from the community of practice within which they carry it out. They have a shared understanding of the work and individuals are drawn into it by a process of learning where the boundaries are defined by the collection of tasks which make up the practice” (cited in Harris, 2001, p. 273). According to Wenger, “Individuals who participate in communities of practice draw their identity from their membership in the community” (p. 273). Wenger suggests, “Communities of practice become resources for organizing our learning as well as contexts in which to manifest our learning through an identity of participation” (p. 273).

Elmore (2000) defines distributed leadership as “multiple sources of guidance and direction, following the contours of expertise in an organization, made coherent through a common culture” (p. 14). He continues, “It is the ‘glue’ of a common task or goal – improvement of instruction – and a common frame of values for how to approach the task” (p. 15). Elmore is not suggesting the overall functioning of an organization rests with an individual, but instead, it is those individuals in positions of formal leadership who have the responsibility of holding the components of the organization together while maintaining and fostering productive relationships.

Copeland (2001) claims there is a need to avoid the formal leader as the individual performer or performance. He states, “Leadership is embedded in various organizational contexts within the school communities, not centrally vested in a person or an office . . . there is a need to identify and support aspects of leadership beyond the role of the principal” (p. 6). Neuman and Simmons (2000) argue, “Distributed leadership calls
on everyone associated with schools . . . to take responsibility for student achievement and to assume leadership roles in areas in which they are competent and skilled” (p. 10). Capitalizing on the human capacity within the organization is the distribution of leadership (Harris, 2002).

Spillane, Halverson and Diamond (2004) believe the sociocultural environment is an integral element of the intellectual competency of the leadership practice of an organization. Using the research of Latour (1987) and Pea (1993), Spillane et al. (2004) state, “. . . because of the mutuality of the individual and environment, human activity is distributed in the interactive web of actors and artifacts, and situation is the appropriate unit of analysis for studying (leadership) practice” (p. 9). They explain by saying, “Because cognition is distributed situationally in the physical environment . . . it is also distributed socially, through other people in collaborative efforts to complete complex tasks” (p. 9). Figure 2 reflects the web of elements involved in the leadership activity within an organization.

Since leadership is viewed as situational, Spillane et al. (2004) focus on leadership activity not the individual leaders. Leadership activity is composed of “the interaction of leaders, followers, and their situation in the execution of particular leadership tasks” (p. 10). The practice of leadership is viewed through the interactions of leaders, followers, and situation, with the followers as an essential element of the leadership activity. “Rather than seeing leadership practices as solely a function of an individual’s ability, skill, charisma, and/or cognition, we argue that it is best understood as a practice distributed over leaders, followers, and their situation” (p. 11).
The distribution of leadership means more than simply separating tasks or performances within the organization but instead the leaders, followers, and situation become interdependent upon one another (Spillane et al., 2004). Interdependencies in leadership practices will emerge between formal and informal leaders when one of the following occurs: (1) performance of certain leadership tasks depends upon resources generated form a prior task, (2) activities produced independently generate a common resource, and (3) performance of a leadership task is dependent on the interaction between two or more constituents (Spillane et al., 2004).

Spillane, Diamond and Jati (2003) conducted research on 13 Chicago elementary schools. Their findings suggest that the work associated with instruction is distributed among multiple leaders who were in formal leadership positions and some who had accepted informal leadership responsibilities. Distributed leadership for Spillane et al.
incorporates the “practice of those multiple individuals in a school who work at mobilizing and guiding school staff in instructional innovation process” (p. 535). They believe there is a need “to identify and explore the enactment of the leadership tasks performed by formal and informal leaders” (p. 535). Studying leadership as a distributive perspective does not mean only exploring individuals, but also it incorporates material artifacts as well as the relations together with leadership practices (Spillane et al., 2003, p. 538; Spillane et al., 2004).

Since Spillane et al. (2003) claim leadership practices are an essential component of distributed leadership, then, within secondary schools, the subject matter will be pertinent when examining the leadership practices of a teacher. Stodolsky (1988) acknowledges subject matter as significant when it comes to the perspectives for teachers’ (leadership) practices. The research of Spillane et al. (2003) suggests, “. . . the manner in which leadership practice is distributed varies among subject areas. Patterns of distribution vary depending on the subject matter” (p. 540).

Distributive leadership serves as the foundation for organizations to grow and change. Sergiovanni (2001) offers two worlds for schools – the “lifeworld” and “systemworld.” He claims schools are often focused on developing the “systemworld” rather than “lifeworld.” The “lifeworld” is focused on social and intellectual capacities of individuals where the “systemworld” is concentrated on examining confined areas that have definitive endings. If schools choose to focus their attention and energy on the “systemworld,” they are not focused on distributing leadership, thus limiting growth and change.
Central to distributed leadership is the “lifeworld,” the collaboration between leaders and followers. According to Harris (2002c), “For distributed leadership to be most effective is has to encompass mutual trust, support and inquiry. Where teachers share good practice and learn together the possibility of securing better quality teaching is increased” (p. 2). Harris continues, “The collaboration and collegiality fostered through distributed leadership has been shown to lead to an enhanced capacity for change and improvement at the school and classroom level” (p. 2). Teachers working together collegially in a collaborative environment allow the picture of the organizations as a learning community to prevail (Gronn, 2002) while empowering teachers to be leaders. In order to establish a collaborative professional learning community in the organization, research shows that time must be allocated for professional development and collaboration with colleagues (Harris, 2002a; Louis & Marks, 1996; Ovando, 1996).

Research suggests that distributed leadership can build an environment capable of maintaining a focus on learning which defines high-performing schools (Day et al., 2006; Hallinger & Heck, 1996; Leithwood, Anderson, Mascall, & Strauss, 2009, Leithwood, Louis, Anderson, & Wahlstrom, 2004; Spillane, 2006). Likewise research by Silins and Mulford (2002) demonstrate that student outcomes are more likely to improve when leadership is distributed throughout the organization and where teachers are empowered in areas that they value. Glickman, Gordon and Ross-Gordon (2001) assembled a list of characteristics for “improving schools” which refers to the improvement of student learning achievements for all students over time. The topmost characteristic was “varied sources of leadership, including distributed leadership” (p. 49). Lastly, Griffin (1995)
demonstrated that distributed leadership has positive outcomes on pedagogy, on the culture of the organization, and on the educational conditions.

The distributed model of leadership challenges the autocratic nature of leadership and the questions the desire to privatize practices. This model allows organizational improvement and change to be communal rather than individualistic. For Elmore (2002), this model predicts failure with social isolation and success when leaders, followers, and the environmental situations become interdependent on one another (p. 24). Harris (2002c) states, “Successful leaders are those who understand relationships and recognize the importance of reciprocal learning processes that lead to shared purposes” (p. 6). Morrison (2002) advocates that schools of the future will necessitate leadership that is democratic, relational, and centered on individuals.

**Department Chairs as Teacher Leaders**

Middle managers represent leaders who find themselves between administrative leadership positions and both teacher leaders and teachers. A unified definition for middle management within the realm of education is lacking. Kemp and Nathan (1989) attempted to summarize the role of middle management as the following: “There is no simple definition of middle management in schools. The closest that one can come to a definition is to say that the school’s middle management are those people whose role places them between the senior management team and those colleagues whose job description does not extend beyond the normal teaching and pastoral functions” (p. 7). Most often, middle managers are more formalized leaders in the school who
communicate information from the administration to the teachers. Middle management in schools refers to subject leaders, heads of departments, subject leaders, instructional supervisors, division leaders, and department chairs. These commonly used terms provide reference to the same position, but the roles and responsibilities of the positions may vary from school to school, dependent upon the expectations of the given institution.

In recent years, the role of the middle manager has drawn increasing attention in literature (Adey, 2000; Bennett, 1999; Brown & Rutherford, 1998, 1999; Brown, Rutherford & Boyle, 2000; Busher & Harris, 1999; Glover et al., 1998, 1999; Gold, 1998; Hannay & Ross, 1999; Harris, Busher & Wise, 2003; Leask & Terrell, 1997; Murphy, 2002; Turner, 1996, 2003; Turner & Bolam, 1998; Wise, 1997). This position has been highlighted more frequently because, previously, leadership lay within the hands of the principals, and this is no longer the case within most schools (Mercer & Ri, 2006). Leadership is being spread to all stakeholders because the tasks are too great for principals to accomplish alone.

For the purpose of this study, middle management will be referred to as department chairs. In hierarchical terms the department chair is a middle manager (Bush, 1999). The department chair is not part of the senior management team, responsible for the overall strategic development of a school, but instead the department chair is responsible for the operational works of others, such as classroom teachers who practice within the realm of the department chair. Department chairs function among various levels in secondary schools. They are responsible to students, teachers, building
administrators, district administrators, and parents. The stress of working among and between these different groups of individuals creates a plethora of responsibilities and an immeasurable amount of strain in terms of time. The role of a department chair has become more multifaceted with both responsibility and accountability increasing (Turner, 1998).

Department chairs are neither teacher nor administrator because in most school districts their position is twofold encompassing both roles. Gabriel (2005) cites, “They nurture colleagues and teach alongside them, but they also must retain allegiance to their administrators. They lack line authority” (p. 2). Even though department chairs lack authority, they possess the potential to change the organization as well as the members of the organization because of their extensive realm of influence. In the more traditional school department chairs are seen as transactional leaders who order supplies, balance budgets, devise the master schedule and transmit information, but in schools where “transformational leadership is present, administrators recognize that the leadership of a department chair can make a significant difference to the climate and culture of the school” (Gabriel, 2005, p. 3).

Transformational administrators tend to surrender control to teacher leaders, and cultivate leadership in these teachers. According to Weller (2001), administrators with transformational characteristics “make better use of unique strengths and contributions that department heads can bring to school management and improvement” (p. 80).

Siskin (1991) stated three conjectures about academic departments in secondary schools: first, departments are fundamental boundaries forming distinct subcultures
within schools; secondly, departments provide links to and participate in the wider community and culture of the respective discipline; and lastly, they serve as powerful administrative entities. Arguably, if department chairs are not working to implement the vision of the principal then subcultures may have the opportunity to develop within the organization creating both competing and conflicting views rather than unification of the organization. Siskin (1991) stated, “….high schools are fundamentally different structures from elementary schools, and one key anatomical difference is their departmentalized differentiation of specialized teachers” (p. 136).

According to Siskin (1991), departments influence teachers and teaching in secondary schools. O’Neill (2000) points out “Research and policy in the field of school ‘effectiveness’ and ‘improvement’ have begun to highlight the subject department as the key variable in both teacher and student learning” (p. 10). Wright (2001), a researcher from New Zealand, states that “middle managers are the most immediate link between national and school administration requirements and policies, and the core business of schools – teaching and learning” (p. 8).

Literature does not paint a positive image of the role of department chair. Research has characterized the position of a department chair as “racehorses with plowhorse duties” (Axley, 1947, 274), “schizophrenic” (Metty, 1969, p. 1), paper pushers (Hord & Murphy, 1985), and “ringmasters” in a “36 ring circus” (Siskin, 1991, p. 606). Foremost within the research on high school department chairs are the numerous roles they perform (Adduci, Woods-Houston & Webb, 1990; Altimari, 1969; Verchota, 1971).
Turner (1996) portrays department chairs as planners, supervisors of instruction, and teacher evaluators. From these responsibilities one can see there appears to be a dual-nature associated with department chairs in secondary school because individuals who hold these positions must encompass both administration and instruction. Department chairs often find themselves caught between two worlds: teacher and administrator. Dunham (1995) contests that the role of department chairs involves a large managerial component with a heavy teaching load. Bell (1992) views the role of the department chair as both manager and leader providing the “vital link” between the administration and the teachers. Similarly, Fitzgerald (2004) maintains that a department chair is simultaneously a leader, a manager, and an administrator who works through other people to achieve key tasks and activities (cited in Bush & West-Burham, 1994; cited in Everand, 1986). Over the past few years, Fitzgerald claims the roles associated with the position of department chair have changed continuously and rapidly, developing further expectations (p. 142).

Katz and Kahn (1978) describe role conflict as “simultaneous occurrence of two or more role expectations such that compliance with one would make the other more difficult” (p. 204). The tension between being an administrator and being a teacher can make it challenging for department chairs to be accepted by their colleagues (Siskin, 1997). There is ambiguity with the role of a department chair. Huse (1980) recognizes the occurrence of role ambiguity “when the individual has insufficient knowledge of the expectations of a position” (p. 53).
The vagueness of the role of a department chair was defined by Koehler (1993), when he said “they walk a tightrope between the maintenance of survival needs of the school and the human professional needs of the people within it” (p. xi). Although the role varies, most department chairs oversee the budget, manage resources, manage and develop curriculum as well as assessment, appraise and develop staff, report outcomes, and serve as full-time expert teachers (Pigott-Irvine, 2002). Dinham et al. (2000) describe the middle management role as “complex, often conflicting set of duties – that is being both formal staff supervisor and ‘coach’ – has to be juggled with key role of initiating and responding to change in all areas” (p. 5). According to Gronn et al. (1998) the roles between middle management and senior management are not delineated adequately.

Early research on the role of the department chair was concerned with the responsibilities and time pressures placed upon department chairs (Busher & Harris, 1999). Eventually research turned towards the leadership role of the department chair and the relationships between the leadership of the department chair and the performance of the department (Bennett, 1995; Harris, 1998; Harris, Jamison & Russ, 1995; Sammons et al., 1997; Turner, 1996).

Glover et al. (1998) identified four dimensions of the work of a department chair. The first dimension is transactional as it involves translating the perspectives and policies of the administrative leaders to the teachers such that the practices are employed in individual classrooms. Blase and Anderson (1995) label this dimension as transactional
since the department chair is viewed as having ‘power over’ others and it involves managing and allocating resources.

The second dimension of work for the department chair is working with the individuals in the department to develop and join together in establishing an identity or goals. It is within this dimension the department chair is working at inspiring a shared vision and empowering the teachers within the department. Blase and Anderson (1995) label this dimension transformational because the department chair is using ‘power with’ or ‘power through’ to generate a collegial and collaborative culture. Members of the department are transforming their feelings, attitudes and beliefs by imposing leadership practices. In the second dimension, the head of the department is working to shape and manage the culture of the department.

The third dimension focuses on improving teachers’ instructional practices as well as student achievement. This dimension incorporates both transactional and transformational leadership practices. It is transactional because the department chair is monitoring a specific level of performance requested by the administrative level, yet it also implies mentoring to support the development of colleagues and pupils.

The final dimension occurs as the department chair acts in a liaison or representative role. This dimension challenges the department chair to extend himself or herself to the external environment outside of the department’s subculture. The department chair represents the larger group of teachers and negotiates on behalf of the department. Both transactional and transformational qualities are employed in this dimension.
According to Blasé (1995), how well department chairs act as transformational leaders, building interdependence and employing interpersonal skills, will affect the degree to which the department chair is capable of creating a collaborative culture. These four dimensions associated with the role of the department chair, generate both complementary and potentially competing demands (Busher & Harris, 1999). The dimensions reflect the intricacies of the transactional role and the pressures facing department chairs.

The role of the department chair becomes even more complex as disparity in departmental structures and cultures are examined closely. Departments vary in size, configuration, status, resource power, and staff expertise which make the role of department chairs different from that experienced by their colleagues who oversee other departments. The subcultures associated with departments affect potential leadership performance differently; therefore, in order to explore the leadership style of department chairs, each must be examined by subject area. The different departmental structures influence the leadership style of the department chair.

Bliss (1992) asserts that the department chair is the connection between management and leadership responsibilities possessed by the principal. Bell (1992) views the department chair as a “between” position, between their teaching colleague and the administration of the school. Being in a middle management position often can cause role ambiguity and much frustration to the individual. Turner (1996) claims the position not only possesses role confusion, but she also emphasizes how it is underutilized in
schools. Turner places emphasis on how the role of the department chair can be pivotal in improving instruction and increasing student learning.

Ultimately, research supports the claim that the department chair position is poorly defined (Adducci, Woods-Houston, & Webb, 1990; Mayer & Zepeda, 2002; Siskin, 1997). Bennett (1995) notes departments in secondary schools are not simply smaller parts of the same school social environment. Siskin (1994) states, “They are separate worlds with their own ethnocentric way of looking at things. They are sites where distinct groups of people come together and together share in and reinforce the distinctive agreements on perspectives, rules and norms which make up subject cultures and communities” (p. 81).

One of the more critical challenges that department chairs face is teaching while managing and leading a team of teachers (Fitzgerald, 2004). According to Blanford and Gibson (2000), if department chairs are to understand the totality of their role, they need to consider their teaching responsibilities within the context of their managerial role. Mayers and Zepeda (2002) believe “department chairpersons . . . are in a position to help lead change if they are empowered to be more than mere gofers attending to administrative detail” (p. 49).

School leadership literature on the responsibilities and roles associated with middle management positions, such as department chairs, is minimal. Evidence is lacking in regards to the role and responsibilities of department chairs. Turner (1996) noted the role of department chairs in schools is not widely understood. The modest literature that can be found, primarily in Western literature, often neglects to encompass
the crucial role that department chairs have in leading teams, in developing, teaching, and evaluating curricula, in appraising teachers, and in training and developing staff.

However, what we do know is that change efforts within schools need to come from different levels within the institution (Harris, 2001). For school improvement efforts to be sustained, change must resonate from various players and arenas within the organization. Harris (2000) argues that department levels within secondary schools are under-utilized but are an integral means of mobilizing and sustaining school improvement (p. 478). There is a need to more carefully study the importance of department chairs in schools (Grossman, 1995).

Leaders are an essential component to facing and conquering problems that face schools (Gunter, 2002). Gronn (1996) believes there is too much weight given to the agency of the leader and “leadership” in education, and leadership is seen as being performed by superiors, better individuals stationed in high ranking positions rather than groups of individuals. The department chair, as formalized teacher leader with transformational characteristics, has the potential to change leadership such that it becomes collective rather than hierarchical.

Departments in high schools in the United States are crucial locations where teachers discern and impose their practices, and also they play a central role in the management of the organization (Siskin 1994, 1997). Siskin (1994) acknowledges, “the departmental plan never reached “ascendancy” in elementary schools, and still remains strongly contested in junior high-middle school debate today. Yet at the high school level the departmental plan was not only taken up, it has taken over” (p. 24). Also
Siskin (1997) concludes those who want to effect change in high schools need to work with departments in some fashion.

Piggot-Irvine (2002) summarized the role of the department chairs, stating, “It is not a role that can be defined and refined as a series of tasks. In reality it is a highly contextualized, complex, dilemma and tension-ridden, political and pressured. The overload and complexity linked to the role is resulting in extreme stress” (p. 2). Dinham et al. (2000) confirmed this summary because they found middle managers to be the most stressed group in schools. “Overall, the most stressed group did not compromise those at the ‘bottom,’ classroom teachers, but those in ‘middle management’ positions such as secondary Heads of Department . . .” (p. 5).

Besides stress, another challenge of the role of department chair is time availability. Even though the position is ideal for improving instruction, few department chairs have the time available to focus on this leadership activity (Siskin, 1991). Turner (1996) identifies the duties of department chairs – coordinating programs, enforcing rules, channeling information, scheduling classes, completing tasks – as being more transactional than transformational. A study performed by Glover and Miller (1999) indicated that many subject (department) leaders are spending the majority of their time completing administrative tasks rather than working on leadership activities. Their work stemmed from and provided additional support for the work of Earley and Fletch-Campbell (1989).

Even though time is limited and stress-levels high, according to Gold (1998), the position of department chair has the most potential in a school to increase school
effectiveness because chairs have direct contact on a daily basis with both teachers and students, and in addition they represent a branch of the administration. Their position is ideal for assisting in improving instruction because they have daily contact with the teachers, and department chairs themselves usually represent expert teachers (Siskin, 1991; Turner, 1996).

Tirozzi (2001) reports that “For high school department chairs to become leaders, the principal must demonstrate strong leadership; he or she must be willing to commit to sustained, comprehensive professional development for all staff members” (p. 434). When Tirozzi refers to “all staff members,” it must include department chairs, even though they are individuals who are an augmentation of the principal’s leadership. It is the principal’s responsibility to empower all teachers. Prestine (1991) contended that principals need to “provide the scaffold for teachers to enhance their understanding and professional awareness” (p. 25) in order for teachers to feel empowered.

Further, Mayers and Zepeda (2002) add, “Unless the principal provides the necessary resources and support, teacher leadership will struggle for survival” (p. 51). Hall (1988) acknowledged that the role of the principal is central to change, but Murphy (1994) argued that teacher leadership is also important to change. Change occurs if the principal wants it to occur, but other key members of the organization, such as department chairs, can influence the principal and play a role in supporting change (Short, Greer & Melvin, 1994).

In 2001 Weller conducted a survey of 200 department headers from urban, suburban, and rural secondary schools to discover what department chairs do in their
middle management positions and to also determine what knowledge and skills are most essential for effective job performance. More than 90% of those surveyed listed interpersonal relations skills, command of subject matter, and good communication skills as essential in order to be effective on the job.

Several studies have suggested that departments are influential and meaningful subunits which influence the assumptions and perceptions of teachers in relation to educational goals and school vision (Abloghasemi, McCormick & Conners, 1999; Harris et al., 1995; Rowan, Raudenbush & Kang, 1991; Siskin, 1991; Stodolsky, 1993; Turner, 1996). Bliss (1989) expressed the need to prepare department chairs for leadership responsibilities if they are to maximize the effectiveness of the position.

**Gender and Leadership Styles**

The leadership style of men and women tend to differ even when they occupy the same leadership role (Eagly, Johannesen-Schmidt & van Engen, 2003). The expectations associated with male and female leadership styles are framed in the social role theory approach to leadership (Eagly & Johannesen-Schmidt, 2001; Eagly & Johnson, 1990; Eagly & Karau, 2002; Eagly, Wood, & Diekmann, 2000). Eagly et al. (2003) support the same definition of social role as Allen (1968) and Biddle (1979). They define social role as being “socially shared expectations that apply to persons who occupy a certain social position or are members of a particular social category” while gender roles are “consensual beliefs about attributes of woman and men” (p. 572). According to social role theorists, when emphasizing gender roles as well as leader roles, the position
occupied by the leader is defined by the hierarchy of the specific position as well as the constraints associated with the gender role.

To an extent, gender roles have been internalized by most individuals (Cross & Madson, 1997; Deaux & Major, 1987; Eagly et al., 2000; Gabriel & Gradner, 1999; Wood, Christensen, Hebl & Rothberger, 1997). Since males and females have different social identities, women and men tend to differ in their personal behavioral expectations in an organizational surroundings (Ely, 1995). Due to these differences, Eagly et al. (2003) concluded, “Self-definitions of managers may thus reflect an integration of their managerial role and gender role, and through self-regulatory processes, these composite definitions influence behavior, thereby shading the discretionary aspects of managerial behavior in gender-stereotypic directions” (p. 572).

The transactional, transformational, and laissez-faire leadership styles of males and females may differ slightly because of the inappropriateness of the role and also the influence on behavior of the gender roles (Eagly et al., 2003). A meta-analysis of 45 studies of transactional, transformational, laissez-faire leadership styles found small differences between the leadership styles of males and females. The study concluded that female leaders were more transformational than male leaders because women are able to defeat the absurdness associated with conforming to either the leader role or the gender role (Eagly et al., 2003). They also discovered that female leaders engaged in more of the contingent reward behaviors associated with transactional leadership while male leaders engaged in the active and passive management by exception associated with transactional leadership as well as laissez-faire leadership.
Coleman (1996, 2002) presented further evidence into females as transformational leaders by completing large-scale research with female and male heads of secondary schools in England. Coleman concluded that women are more likely than men to demonstrate leadership behaviors associated with transformational leadership.

Researchers have maintained that female leaders in comparison to male leaders are less hierarchical, more cooperative, more collaborative, and more willing to develop the self-worth of others (Book, 2000; Eagly et al., 2003; Helgesen, 1990; Loden, 1985; Rosener, 1995). It has been argued by these same authors that woman make superior leaders for modern organizations because of these patterns of behaviors. These behaviors of female leaders are consistent with the communal behavior requirements – behavior that is friendly, unselfish, concerned with others, and expressive – of the female gender role (Eagly & Johnson, 1990; Hall & Friedman, 1999; Moskowitz, Suh & Desaulniers, 1994; Troemel-Ploetz, 1994). In a meta-analysis study by Eagly, Karau, Miner, and Johnson (1994), it was shown that women were less likely than men to inflict their authority in a method reflective of power and control.

Some aspects of transformational leadership – encouraging respect and pride by association with a leader - cannot be united with the sex of the gender role. Few, if any, transformational behaviors have male implications (Eagly et al., 2003). Studies have shown that overall communication for most subordinates is higher between the leaders’ feminine personality elements and their transformational style than their transactional style (Hackmann, Furniss, Hills, & Patterson, 1992; Ross & Offermann, 1997).
Lastly, “it is likely that higher standards are imposed on women to attain leadership roles and perhaps to attain them well. Because transformational styles are particularly skillful in most organizational settings, a tendency for women to have a more transformational style than men could reflect the selection of women who have met the higher standard that is imposed on women” (Eagly et al., 2003, pp. 573-574).

Summary

Leadership is not an unaccompanied performance. Spillane et al. (2003) explain that “leadership expertise extends beyond the mind of an individual leader” (p. 542). In secondary schools leadership of the principal extends to the department chairs. Indeed, “Principals are not the only leaders in schools. In particular, in high schools, department heads are expected to fulfill leadership functions and influence the culture of their schools. Arguably, the actions of these people (department heads) may affect the implementation of the principal’s vision for the school” (Abloghasemi et al., 1999, p. 1).

Elmore (2000) suggests, “In a knowledge-intensive enterprise like teaching and learning there is no way to perform these complex tasks without widely distributing the responsibilities for leadership among roles in the organization” (p. 14). Furthermore, Sergiovanni (1984) states, “The burdens of leadership will be less if leadership functions and roles are shared and if the concept of leadership density were to emerge as a viable replacement for principal leadership” (p. 13).

The quality of leadership influences the motivation of teachers and the quality of teaching in the classroom (Fullan, 2001; Sergiovanni, 2001). Leithwood and Jantzi cite, “The evidence from international research base is unequivocal – effective leaders
exercise an indirect but powerful influence on the effectiveness of school and on the achievement of students” (Harris, 2002a, p. 1). Kouzes and Posner (2003) studied thousands of cases of effective leadership. They were not able to find any examples of unexpected achievements attained without the support and involvement of various individuals.

We’ve yet to find a single instance which one talented person – leader or individual contributor – accounted for most, let alone 100 percent, of the success. Throughout the years, leaders from all professions, from all economic sectors, and from around the globe continue to tell us, ‘You can’t do it alone.’ Leadership . . . is a team performance . . . The winning strategies will be based on the ‘we not I’ philosophy. Collaboration is a social imperative. Without it people can’t get extraordinary things done in organizations. (p. 20)

Ogawa and Bossert (1995) associate leadership to an organizational quality rather than an individual quality. “The parameters of leadership (are) at the organizational level. This is hardly a startling revelation, but one that is missed by many conceptualizations of leadership . . . The leadership must affect more than the individual’s actions; it must influence the system in which actions occur” (p. 233). This model of leadership connects to the distributed model of leadership since leadership is not restricted to specific roles in the organization. “It flows through the networks of roles that compromise the organization. Moreover, leadership is based on the development of resources that are distributed through the network of roles, with different roles having access to different levels and types of resources” (p. 238).

Spillane et al. (2001) model of distributed leadership supports Ogawa and Bossert’s beliefs. Spillane et al. state that “school leadership is best understood as a
distributed practice, stretched over the school’s social and situational contexts” (p. 23).

The distributed practice creates interdependence among individuals and the organization. They depend on each other to enhance their pedagogical practices, ultimately, affecting the conditions for teaching and learning.

A few recent students have attempted to begin to identify characteristics of teachers charged with leading their peers (Danielson, 2006; Krisok, 2001; Taylor, Moxley, Chanter & Boulware, 2007). Childs-Bowen, Moller and Scriveners (2000) “believe teachers are leaders when they function in professional learning communities to affect student learning; contribute to school improvement; inspire excellence in practice and empower stake holders to participate in educational improvement” (p. 28). These views of teacher leadership require the leader to focus on instructional practices with colleagues, but also to be committed to the organization to improve teaching and learning.

Bass (1998) shares how transformational characteristics of leaders need to model behaviors for their peers:

…transformational leaders behave in ways that result in their being role models for followers. The leaders are admired, respected, and trusted. Followers identify with the leaders and want to emulate them; leaders are endowed by their followers as having extraordinary capabilities, persistence, and determination ... Being a model of trust was considered the most empowering leadership role. The empowering leader had to be consistent in words and actions ... In organizational transformational culture, there is a sense of purpose and a feeling of family. Commitments are long-term. Mutual interests are shared along with a sense of shared fates and interdependence of leaders and followers.” (pp. 5, 148, 65)
Schools have a need for transformational, formalized teacher leaders – department chairs. These positional leaders have the capability of inspiring others by modeling transformational behaviors and the opportunity to empower others while building leadership capacity throughout the organization.

Moreover, Wilson and Corcoran (1988), in their study of effective high schools, concluded that department chairs and members of the department play leadership roles in effective high schools. The role of the department chair is nonspecific and versatile in capacity, thus the leadership talents and skills of the department chair often do not become utilized fully (Weller, 2001). Research by Weller demonstrates department chairs identify the necessity of transformational behaviors – interpersonal relational skills, good communication skills, knowledge of group dynamics and leadership, diplomacy, strong teaching practices, and command of subject knowledge – as most essential to effective performance of the position.
CHAPTER III
RESEARCH METHODOLOGY

Introduction

The purpose of this quantitative study is to determine if any differences exist between the self-perceived leadership styles of the science department chairs and the leadership styles of the science department chairs as observed by the principal of their school. This chapter provides a review of the research questions being investigated in this study. Additionally it describes the methodology, instrumentation, and procedures used in this quantitative study, as well as the sample population and data analysis being employed by this study.

Research Questions

The research questions to be investigated as part of this quantitative study are as follows:

**Research Question #1**: According to the science department chairs, what are the transformational leadership practices in which science department chairs engage?

**Research Question #2**: According to the principals, what are the transformational leadership practices in which science department chairs engage?

**Research Question #3**: How do background variables such as gender, professional experience, educational level, and age relate to transformational leadership
practices of science department chairs as perceived by both science department chairs and principals?

**Research Question #4:** What is the relationship between the science department chairs’ self-perceptions of their transformational leadership practices and the principals’ observed perceptions of the science department chairs transformational leadership practices?

**Sample Population**

There are two groups of participants in this study. One group consists of 126 science department chairs of secondary suburban public schools located between Interstate 80 and the Illinois-Wisconsin border. The second group is 126 building principals from the schools where the science department chairs are employed. All high schools considered for this study are public and are located in the suburbs between Interstate 80 and the Illinois-Wisconsin border. The high schools vary in terms of suburban location, income, race, ethnicity, state test scores, attendance, truancy graduation rates, and mobility.

Using school and/or district websites, 126 science department chairs for the academic year of 2009-2010 have been identified from various secondary public schools in all suburban areas of Chicago, Illinois. Once the science department chairs were identified, the corresponding 126 principals were identified through the same website. These principals serve as the direct supervisor of a science department chair in the study. Phone calls to each school were made to confirm both the accuracy of the names and the email addresses of both the science department chair and the principal.
**Instrumentation**

Since this quantitative study will examine the transformational leadership practices of science department chairs as perceived by both the science department chairs and their principals, the Kouzes and Posner *Leadership Practices Inventory* (LPI), Third Edition (2007), was selected to measure leadership scores. The LPI survey was created and tested for validity and reliability by James M. Kouzes and Barry Z. Posner (2007, 2003, 2002, 1995, 1987). It has been used for over 25 years, recommended by other educational researchers (Alger, 2008), and has strong statistical support regarding validity and reliability (Kouzes & Posner 2007, 2002, 1995, 1987). The LPI-self survey (see Appendix A) will be used by the department chairs as a means for them to evaluate their own leadership behaviors, while the principals will use the LPI-observer survey (see Appendix B) to evaluate the leadership behaviors of the science department chair in their school. The demographics questionnaire for the science department chairs was designed by the researcher of this study to ascertain demographic data about the leaders (see Appendix C).

The LPI survey is based on the conceptual leadership framework designed by Kouzes and Posner to measure five exemplary leadership practices. The dependent variables measured by the LPI surveys include: *Model the Way (Model)*, *Inspire a Shared Vision (Inspire)*, *Challenge the Process (Challenge)*, *Enable Others to Act (Enable)*, and *Encourage the Heart (Encourage)*. These five practices organize effective behaviors associated with leaders into categories or commitments (Kouzes & Posner...
2007, 2002, 1995, 1987). Factor analysis studies demonstrate that these five dimensions of leadership represent individual units for effective leadership behavior.

If leaders practice “model the way” they are clear about their values, their beliefs, and their expectations. “Model the way” is a leadership practice which focuses on the leader’s behaviors. The leader clarifies personal values and involves the team members in building and affirming shared values (Kouzes & Posner 2007, 2003, 2002, 1995, 1987). Both the leader’s actions and spoken word reflect the values and beliefs such that credibility as a leader becomes earned through the leader’s consistent behaviors. To “model the way” requires effort, steadfastness, competence, and attention to detail (Kouzes & Posner 2007, 2003, 2002, 1995, 1987).

Leaders who “inspire a shared vision” believe they can make a difference by visualizing a direction or desired end state for an organization. In making a difference, they change the current culture by making it better while creating outcomes that have never been achieved within an organization. For a leader to be able to “inspire a shared vision” they must know their constituents, they must have an interest in others, and they must be able to enlist the support of other in endeavors (Kouzes & Posner 2007, 2003, 2002, 1995, 1987). “Inspire a shared vision” is a leadership practice which refers to a leader’s ability to devise a vision and inspire others to take ownership of the vision (Kouzes & Posner, Posner 2007, 2003, 2002, 1995, 1987).

If a leader is willing to venture out and act as a pioneer within an organization the leader demonstrates the ability to “challenge the process.” “Challenging the process” is a leadership practice that identifies leaders as creative, willing to seek new ways of
accomplishing tasks, taking risks and learning from their mistakes (Kouzes & Posner 2007, 2003, 2002, 1995, 1987). These leaders are always in search of innovation, progress, and improvement but it does not have to come from only the leader. These qualities arise because the leader who “challenges the process” listens to others and takes risks. Leadership becomes about learning from errors and failures (Kouzes & Posner 2007, 2003, 2002, 1995, 1987).

“Enabling others to act” is the fourth leadership practice which fosters collaboration and builds trust. “Enabling others to act” is a leadership practice which strengthens an organizations capacity through empowerment and mutual trust. The leader or leaders make others feel strong, capable, informed, and connected to an organization (Kouzes & Posner 2007, 2003, 2002, 1995, 1987). Empowerment becomes central to an organization if it wants to strengthen capacity. Mutual trust is fostered within in an organization by leaders who uphold this practice. If trust is lacking people will not want to take risks. If risks are not taken, transformations will be non-existent (Kouzes & Posner 2007, 2003, 2002, 1995, 1987).

The last practice, “encouraging the heart,” recognizes individual contributions and demonstrates a genuine appreciation for the contributions to the team. “Encouraging the heart” is a leadership practice which focuses on the recognition of contributions by all team members. Performance results are celebrated and made visible to all members; it builds a strong sense of collective identity and team spirit (Kouzes & Posner 2007, 2003, 2002, 1995, 1987). By “encouraging the heart” through authentic celebrations and rituals, the leader creates a collective identity and a team spirit. For a leader to

This transformational leadership model was chosen not only for its extensive base, but also because as education has moved from instructional leadership to transformational leadership to teacher leadership it is evident that effective transformational behaviors are necessary for strong teacher leadership. Teacher leaders are providing a service for schools and students. Teacher leadership falls into the service model of leadership because these leaders rely on collaboration, trust, interdependence, and vision while as serving as models for colleagues and community members. Mintzberg (2003) shared that for organizations to be ensured success it is necessary to build strong organizations with leaders at many levels. The core leaders need to care about the institution, and have ideas while at the same time the ideas need to be able to flow freely and easily throughout the institution. The central element is for schools to develop leaders at all levels however they also need to develop and to sustain transformational leadership skills as a foundation for teacher leaders if they desire to be effective and strong institutions.

Survey Structure

The Leadership Practice Inventory (LPI) has transformed the five key leadership practices into thirty multiple choice behavioral statements which are used to assess the skills of leaders. There are six multiple choice statements compromising each of the five leadership practices. The LPI bases each statement associated with a behavior on a ten
point Likert-type scale ranging from 1, signifying “almost never” to 10, signifying “almost always.” This scale measures the frequency with which the individual perceives the leader engages in the specific behavior. The ten-point frequency scale for the survey have the following responses: 1 = *Almost never* (do what is described in the statement); 2 = *Rarely*; 3 = *Seldom*; 4 = *Once in a while*; 5 = *Occasionally*; 6 = *Sometimes*; 7 = *Fairly often*; 8 = *Usually*; 9 = *Very frequently*; and 10 = *Almost always* (Kouzes & Posner, 2007, 2003, 2002, 1995, 1987). There are two versions of the instrument: *Self* and *Observer*. The *Self* form will be completed by the science department chairs since they are reporting on their own behaviors while the *Observer* form will be completed by the principals because they are reporting on the behaviors they feel they have witnessed in the science department chairs. The self-form begins with questions with “I” while the observer form does not.

The instruments were designed in such a way that each of the five practices of leadership is correlated to six questions on each survey. Each of the five practices of leadership consists of two commitments. Table 1 in Chapter I explains the commitment for each of the leadership practices.

The foundation for the leadership model designed by Kouzes and Posner (2007, 2003, 2002, 1995, 1987) are both the five practices of leadership as well as the commitments of leadership. Therefore, the results assign an overall rating for each of the five key leadership practices, and the data is dissected further to provide information on individual items connected to the commitments. The results include percentile rankings
using a norm group consisting of all leaders and observers since 1988 having completed the LPI survey.

**Reliability and Validity**

The LPI has firm psychometric properties and has been proven reliable in recognizing behaviors that cause a variation in the effectiveness of leaders. The LPI instrument stemmed from triangulation of qualitative and quantitative research methods and studies (Kouzes & Posner, 2007). Reliability reveals the extent to which the survey produces the same results on repeated trials. According to Kouzes and Posner, the internal reliability is very strong. All five leadership practices have an internal reliability scores that are above 0.75 for the *Self* version, and all scores on the *Observer* version are above the 0.85 level consistently. Based on the internal reliability scores the leadership practices are correlated strongly with each other. By definition the validity indicates that the survey measures what it declares it measures. The LPI has been shown to be a good indicator of validity as well as it shows prognostic validity (Kouzes & Posner, 2007, 2003, 2002, 1995, 1987). Test-retest reliability scores are in the 0.90+ range. As shown in Table 2, the researchers, Kouzes and Posner (2003), reported the following means and standard deviations for each of the factors on the LPI-self and LPI-observer.
Table 2. Internal Reliability of LPI-Self and Observer Scales

<table>
<thead>
<tr>
<th>Practices of Leadership</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Internal Reliability Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Model the Way</td>
<td>47.0</td>
<td>6.0</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>42.5</td>
<td>8.5</td>
<td>0.89</td>
</tr>
<tr>
<td>2. Inspire a Shared Vision</td>
<td>40.6</td>
<td>8.8</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td>42.0</td>
<td>10.6</td>
<td>0.92</td>
</tr>
<tr>
<td>3. Challenge the Process</td>
<td>43.9</td>
<td>6.8</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>44.4</td>
<td>9.1</td>
<td>0.88</td>
</tr>
<tr>
<td>4. Enable Others to Act</td>
<td>48.7</td>
<td>5.4</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td>47.8</td>
<td>8.4</td>
<td>0.88</td>
</tr>
<tr>
<td>5. Encourage the Heart</td>
<td>43.8</td>
<td>8.0</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td>44.4</td>
<td>10.2</td>
<td>0.92</td>
</tr>
</tbody>
</table>

(Kouzes & Posner, 2003)

Copyrights for LPI

The LPI instrument is a copyrighted publication. In order to obtain permission for the use of the instrument for this study, the researcher contacted the authors of the instrument via The Leadership Challenge website (www.leadershipchallenge.com). In a return letter, the authors agreed to the reproduction of the Leadership Practices Inventory survey at no cost (see Appendix D). In order to use an electronic distribution of the LPI, Ms. Lisa Shannon at John Wiley & Sons, Inc. was contacted via electronic mail (see Appendix E). Permission was granted from Wiley to use a web-based version of the LPI (www.lpionline.com) at a cost of ten dollars for each leader, with observers at no cost.
however, the researcher had decided to use the Opinio electronic distribution system through Office of Research at Loyola University of Chicago. Since the researcher had decided to use the Opinio electronic distribution system rather than the web-based version of the LPI, an additional fee of $100 would be required by the researcher (see Appendix F). With both reproduction and/or use of the LPI instrument Kouzes and Posner requested the researcher agree to the following: (a) the instrument be used only for research purposes, and additionally, it would not be sold or used in conjunction with any compensated management development activities; (b) the copyright of the LPI would be retained by Kouzes Posner International; (c) copyright statement “Copyright © 2003 James M. Kouzes and Barry Z. Posner. All rights reserved. Used with permission” is included on all copies of the instrument; (d) one electronic copy of the dissertation and one copy of all papers, reports, articles, and the like which make use of the LPI data be sent promptly to the authors’ attention; (e) and the researcher agrees to include an abstract of the study and any other published papers utilizing the LPI on their websites.

**Procedures for Data Collection**

The data for this study will be ascertained by three components: (a) the LPI-self survey for the science department chairs, (b) a demographic questionnaire for science department chairs, and (c) the LPI-observer survey for principals. Both the LPI-self and the LPI-observer were developed by James Kouzes and Barry Posner (1993). The demographic questionnaire was developed by the researcher of this study. The independent variables in the demographic questionnaire will be used to compare the science department chairs’ self-perceived leadership behaviors based on gender, age,
work experience, and educational level. It will allow the researcher the ability to ascertain self-perceptions of leadership practices within the context of gender, age, educational level, work experience, and school culture as it relates to the role and responsibilities of the department chair. The demographic survey will follow the LPI-self survey for the department chair.

Prior to communicating with the participants, approval will be sought from all committee members, Institutional Review Board of Loyola University of Chicago, and the Graduate School of Education. The procedures below will guide the data collection process.

The data collection for this study will occur over a one month period. Permission was granted for use of the *Leadership Practice Inventory* survey through a formal letter from Kouzes Posner International in June of 2009. Once the Leadership Practice Inventory is purchased through John Wiley & Sons, Inc., after IRB approval, the researcher will enter the email addresses of the leaders as well as the observers into the Opinio survey database at Loyola University of Chicago and the survey instruments.

The subjects will receive an electronic mailing from the researcher. The electronic mailing will include a formal letter containing a description of the purpose of the research study, the nature of voluntary participation in the study, the guarantee of confidentiality, and contact information for the researcher. The letter will also identify the time frame for completion of the survey or surveys. The letters for the formal leaders, science department chairs, will have a slightly different explanation of the process as compared to the letter for the observer, the principal (see Appendices F & G). This letter
to potential participants will serve as an informed consent document, explaining that completion of the survey implies the participants’ consent to be involved in a research study. The researcher will apply for a waiver of documentation of consent.

The link to the online survey will be within the electronic letter. If participants select the link they will be directed to the online survey. Once the electronic distribution is sent to the participants they will have a two week time frame to complete the survey. Besides the initial electronic mailing, two additional electronic mailing reminders will be sent to all participants encouraging them to participate and requesting their support (see Appendices H & I).

The LPI data from the science department chair and the principal will need to be matched with one another. In order to match this data, the instrumentation will require each participant, science department chairs and principals, to identify the name of their high school. The research is requesting the participants to identify the name of their school in order to link each science department chair with his or her principal. Participants will be required to identify their school name as the last question of the survey.

In order to maintain confidentiality and safeguard the data, the researcher will download the data and re-code the data using numbers. Only data that has been de-identified will be used by the researcher. The original data set will be destroyed once it has been re-coded numerically, and the master list will be kept separate from the data in a locked file cabinet in the researcher’s home. All recoded data will be kept on the researcher’s personal home computer, and results will be reported in aggregate form.
Only the researcher and her advisor will have access to the data. After five years, the researcher will destroy the data.

**Analysis of Data**

Analysis of data will align with the original analysis processed used by Kouzes and Posners (2007, 2002, 1995 and 1987) in order to ascertain comparable results. This analysis will include statistical procedures of multiple regression, correlation, Pearson Product Moment Correlation, t-tests, and ANOVA at a 0.05 alpha level of significance. When using the web-based software from John Wiley and Son the data can be ascertained immediately for each of the leaders, as well as for the comparison between the self-perceptions and the perceptions noted by the observer. Tabulation and scoring of the results for the sample population can be done using specific software associated with scoring and statistics, such as SPSS. The data ascertained from the survey can be converted into Excel tables and put into SPSS for statistical analysis.

Both science department chairs and principals will be evaluating the transformational leadership practices in which science department chairs engage in at their school. Descriptive statistics will be used to summarize the five leadership practices of the science department chairs as perceived by the science department chair and as perceived by the principal. A paired t-test will be used to compare the responses of science department chairs and the responses of the principals for each of the five leadership factors. Multiple regression analyses and analysis of variance will be used to identify the relationships between the demographic data of the science department chairs and the five transformational leadership practices.
Summary

This study will employ the *Leadership Practice Inventory* (LPI), a survey developed by Kouzes and Posner (2007, 2002, 1995, 1987). The LPI has transformed the five key leadership practices into thirty multiple choice behavioral statements which are used to assess the transformational skills of leaders. It measures the extent to which a leader is practicing the five practices of leadership – model the way, inspire a shared vision, challenge the process, enable others to act, and encourage the heart. These five practices of leadership are tied to ten commitments which compose this transformational leadership model. In educational research, transformational leadership characteristics commonly include what is referred to as the four I’s: intellectual stimulation, individual consideration, idealized influence, and inspirational motivation. These four I’s link closely with the five leadership practices put forth by Kouzes and Posner.

The researcher will interpret the results of the LPI-self survey collected from science department chairs in secondary public schools in all suburbs of Chicago as well as the results of the LPI-observer survey collected from principals who oversee the science department chairs. The LPI-self survey will be used by the department chairs as a means for them to evaluate their own transformational leadership behaviors, while the principals will use the LPI-observer survey to evaluate the transformational leadership behaviors of the science department chair in their school. A demographics questionnaire for the science department chairs designed by the researcher of this study will be used to ascertain demographic data about the formalized teacher leaders – science department chairs.
The researcher is seeking to understand the transformational leadership practices in which science department chairs engage according to their self-perceptions, as well as to understand the transformational leadership practices in which science department chairs engage as observed by their principals. The researcher hopes to determine if there is a relationship between the science department chairs’ self-perception of their transformational leadership practices and the principals’ observed perceptions of the science department chairs’ transformational leadership practices. Lastly, the researcher is seeking to identify if background variables such as gender, professional experience, educational level, and age relate to the transformational leadership practices of the science department chair.
CHAPTER IV  
ANALYSIS OF DATA

The purposes of this quantitative study were two-fold: (1) to investigate the relationship between the transformational leadership practices of formal teacher leaders – science department chairs – as perceived by both the science department chairs themselves and the principals who supervise the department chairs as measured by the Leadership Practice Inventory (LPI) developed by Kouzes and Posner (2007, 2003, 2002, 1995, 1987); and (2) to determine to what extent are self-perceptions of transformational leadership behaviors and observed perceptions of transformational leadership behaviors related to: (a) professional experience as a teacher; (b) professional experience as a department chair; (c) gender; (d) age; (e) educational level determined by degrees earned; and (f) size of department. This collected data is focused on transformational leadership behaviors because it is trying to determine to what degree formalized teacher leaders, specifically science department chairs, impose transformational practices.

The research questions that were investigated as part of this quantitative study were as follows:

Research Question #1: According to the science department chairs, what are the transformational leadership practices in which science department chairs engage?
Research Question #2: According to the principals, what are the transformational leadership practices in which science department chairs engage?

Research Question #3: How do background variables such as gender, professional experience, educational level, and age relate to transformational leadership practices of science department chairs as perceived by both science department chairs and principals?

Research Question #4: What is the relationship between science department chairs’ self-perceptions of their transformational leadership practices and the principals’ observed perceptions of the science department chairs transformational leadership practices?

The data from this study were obtained from the administration of an online survey to two groups of participants – science department chairs and principals – via Opinio software at Loyola University of Chicago. Both groups of participants were employed by secondary suburban public schools located between Interstate 80 and the Illinois-Wisconsin border. There were 126 secondary suburban public schools identified within these boundaries. The 126 science department chairs were asked to respond to the LPI-self instrument developed by Kouzes and Posner as well as to a demographic questionnaire created by the researcher (see Appendices A and C), whereas the 126 principals were asked to respond only to the LPI-observer instrument (see Appendix B) developed by Kouzes and Posner.

The LPI surveys were scored using the given measures established by Kouzes and Posner (2007, 2003, 2002). Data from the LPI-self surveys were used to detect the
transformational leadership self-perceptions of the science department chairs in this study. The participating principals provided data on the observed perceptions of the science department chairs’ transformational leadership practices. Lastly, data from the LPI instruments and the demographic questionnaire were used to identify relationships between perceived transformational leadership behaviors and demographic characteristics associated with the science department chairs. The demographic components in this study were: professional experience, age, gender, department size, and educational level.

Scrutiny of data aligned with the original analysis used by Kouzes and Posner (2007, 2002, 1995, 1987) in order to ascertain comparable results. The examination of data included statistical procedures, Pearson’s correlation, t-tests, and analysis of variance at a 0.05 alpha level of significance to examine: (1) self-perceived transformational leadership practices of the science department chairs; (2) observed perceptions of transformational leadership practices of the science department chairs by principals; (3) the relationship between the science department chairs self-perceptions of their transformational leadership practices and the principal’s observed perceptions of the science department chairs transformational practices; and (4) to identify the relationships between perceived transformational leadership practices and demographic characteristics of the science department chairs. Statistical analyses for this study were performed using both Microsoft Excel and SPSS software.

Forty-seven of the 126 science department chairs completed the survey, representing a 37.30% participation rate for science department chairs. Of the 126 principals surveyed 28 responded which represents a 22.22% response rate. Sixteen of
the science department chairs and principals who participated were from the same school building thus providing 12.70% response rate when correlating science department chair and principal by school building.

Demographical Data of Science Department Chairs

The demographic profile of the science department chairs included in this study is provided in Tables 3, 4, and 5. These tables report frequencies and percentages of subjects by gender, age, degree, years of teaching experience, years served as a department chair, and department population size.

Table 3 reports the gender composition of the science department chairs was comprised of 25 (53.19%) male and 22 (46.81%) female subjects. The gender of the principals was unknown because they were not required to complete a demographics portion of the survey. The youngest participant was under 30 years of age, which represented 2.1% of the studied sample of department chairs. The largest age group in the sample was between the ages 40 and 49 (n=19) or 40.43% of the study group. Closely mimicking this age group in percentage are the participants between 30 and 39 (n=18) which comprised 38.30% of the study group.
Table 3. Analysis of Gender and Age of Science Department Chairs

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (n=47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>25</td>
<td>53.19</td>
</tr>
<tr>
<td>Males</td>
<td>22</td>
<td>46.81</td>
</tr>
<tr>
<td>Age (n=47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 30</td>
<td>1</td>
<td>2.13</td>
</tr>
<tr>
<td>30 – 39</td>
<td>18</td>
<td>38.30</td>
</tr>
<tr>
<td>40 – 49</td>
<td>19</td>
<td>40.43</td>
</tr>
<tr>
<td>50 – 59</td>
<td>8</td>
<td>17.02</td>
</tr>
<tr>
<td>No answer</td>
<td>1</td>
<td>2.13</td>
</tr>
</tbody>
</table>

Shown in Table 4 is the highest attained degree for the science department chairs, as well as the years of full time teaching experience the department chair had prior to being appointed science department chair.

In terms of teaching experience, graphically the data from Table 4 would show a traditional bell curve. The majority of the science department chairs (n=11) or 23.40% taught between seven and nine years before assuming the position as a department chair. The group between ten and twelve years (n=10) accounted for 21.28% of the total sample which almost mirrors the percentage response for the seven to nine year group. Thus the
peak of the bell curve falls between seven and twelve years for teaching experience prior to becoming a science department chair.

Table 4. Analysis of Highest Educational Degree and Teaching Experience of Science Department Chairs

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Degree (n=47)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masters Degree in education, administration, or curriculum</td>
<td>36</td>
<td>76.60</td>
</tr>
<tr>
<td>Masters Degree in Science or another content area</td>
<td>9</td>
<td>19.15</td>
</tr>
<tr>
<td>PhD in administration or curriculum</td>
<td>2</td>
<td>4.26</td>
</tr>
<tr>
<td><strong>Years Teaching Science Full Time (n=47)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-3 years</td>
<td>3</td>
<td>6.38</td>
</tr>
<tr>
<td>4-6 years</td>
<td>6</td>
<td>12.77</td>
</tr>
<tr>
<td>7-9 years</td>
<td>11</td>
<td>23.40</td>
</tr>
<tr>
<td>10-12 years</td>
<td>10</td>
<td>21.28</td>
</tr>
<tr>
<td>13-15 years</td>
<td>6</td>
<td>12.77</td>
</tr>
<tr>
<td>16-19 years</td>
<td>5</td>
<td>10.64</td>
</tr>
<tr>
<td>20-23 years</td>
<td>2</td>
<td>4.26</td>
</tr>
<tr>
<td>24+ years</td>
<td>3</td>
<td>6.38</td>
</tr>
<tr>
<td>No answer</td>
<td>1</td>
<td>2.13</td>
</tr>
</tbody>
</table>
Additionally, Table 4 depicts that the majority of the science department chairs (n=45) or 95.74% have attained an educational degree at the masters level. The data shows that 76.60% (n=36) of the science department chairs have acquired a master degree outside a course content-specific area (Science, Music, English, etc.). Thus, 76.6% of the studied population of department chairs had a Masters degree in an educational field of administration, curriculum or teaching. Lastly, only 4.26% (n=2) of the science department chairs hold a doctoral degree in administration or curriculum.

Made known in Table 5 are two pieces of demographic data relevant to the science department chairs. First, the table shows the total number of years the science department chairs have served as a science department chair regardless of the number of schools in which the chair has been employed while in this position. Additionally, the table shows the current population size of the department for each of the participating subjects.

The main component gleaned from Table 5 is the years a science department chair has served a school in this capacity. It appears that not many chairs stay in the position beyond seven to nine years. Thirty-nine science department chairs or 82.98% of sample have served between one to nine years with only five department chairs or 10.64% serving as department chair between ten and twelve years. Only three of the participants in the study or 6.38% served in this formalized teacher leadership role beyond twelve years, while only eight department chairs or 17.02% served beyond ten years.
Table 5. Analysis of Years Served as Science Department Chair and Department Population Size

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Years as Department Chair (n=47)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-3 years</td>
<td>14</td>
<td>29.79</td>
</tr>
<tr>
<td>4-6 years</td>
<td>11</td>
<td>23.40</td>
</tr>
<tr>
<td>7-9 years</td>
<td>14</td>
<td>29.79</td>
</tr>
<tr>
<td>10-12 years</td>
<td>5</td>
<td>10.64</td>
</tr>
<tr>
<td>13-15 years</td>
<td>1</td>
<td>2.13</td>
</tr>
<tr>
<td>16-19 years</td>
<td>1</td>
<td>2.13</td>
</tr>
<tr>
<td>20-23 years</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>24+ years</td>
<td>1</td>
<td>2.13</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Department Population Size (n=47)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-12 teachers</td>
<td>11</td>
<td>23.40</td>
</tr>
<tr>
<td>13-15 teachers</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16-19 teachers</td>
<td>13</td>
<td>27.66</td>
</tr>
<tr>
<td>20-23 teachers</td>
<td>11</td>
<td>23.40</td>
</tr>
<tr>
<td>24-27 teachers</td>
<td>5</td>
<td>10.64</td>
</tr>
<tr>
<td>28-31 teachers</td>
<td>1</td>
<td>2.13</td>
</tr>
<tr>
<td>32-34 teachers</td>
<td>1</td>
<td>2.13</td>
</tr>
<tr>
<td>35+ teachers</td>
<td>5</td>
<td>10.64</td>
</tr>
</tbody>
</table>
The results of the research questions are presented in the following section. The response to the research questions are divided into four sections: (1) self-perceptions of the transformational leadership practices in which science department chairs engage; (2) the relationship of background variables – gender, age, years of experience, and department size – to transformational leadership practices of science department chairs as perceived by the science department chairs; (3) observed perceptions of the transformational leadership practices of science department chairs as perceived by principals; and (4) the relationship between the science department chairs’ self perceptions of their transformational leadership practices and the principals’ observed perceptions of the science department chairs transformational leadership practices.

**Self-Perceptions of Transformational Leadership Practices of Science Department Chairs**

Data analysis for the first research question involved identification of the means and standard deviations that were exhibited by science department chairs for each of the five exemplary leadership practices. The five leadership practices include: (1) Model the Way, (2) Inspire a Shared Vision, (3) Challenge the Process, (4) Enable Others to Act, and (5) Encourage the Heart. These five leadership practices organize effective behaviors associated with transformational leadership into categories or commitments and numerous studies demonstrate that these five practices of leadership represent individual units for effective transformational leadership behaviors (Kouzes & Posner 2007, 2003, 2002, 1995, 1987). The possible range of self-rating subscores for each of the five leadership practices was six to sixty because there were six questions out of thirty
on the LPI survey (self and observed) that measured each of the five practices on a scale of one to ten (see Appendix L). Table 6 shows normative data for the means and standard deviations for each leadership practice by both respondent types – self and observer (Posner, 2010).

Table 6. Normative Means and Standard Deviations for Each Leadership Practice for Self and Observer LPI-Surveys

<table>
<thead>
<tr>
<th>Leadership Practice</th>
<th>Self Mean</th>
<th>Self Std Deviation</th>
<th>Observer Mean</th>
<th>Observer Std Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge the Process</td>
<td>44.41</td>
<td>9.40</td>
<td>44.76</td>
<td>9.54</td>
</tr>
<tr>
<td>Enable Others to Act</td>
<td>49.43</td>
<td>7.81</td>
<td>49.32</td>
<td>8.20</td>
</tr>
<tr>
<td>Encourage the Heart</td>
<td>45.54</td>
<td>10.22</td>
<td>45.86</td>
<td>10.42</td>
</tr>
<tr>
<td>Inspire a Shared Vision</td>
<td>43.29</td>
<td>10.74</td>
<td>43.70</td>
<td>10.82</td>
</tr>
<tr>
<td>Model the Way</td>
<td>46.51</td>
<td>6.92</td>
<td>46.76</td>
<td>8.86</td>
</tr>
</tbody>
</table>

(Posner, 2010)

As apparent in Table 6, the normative ranking of leadership practices ranking according to the means for both LPI surveys – self and observer – are as follows: (1) Enable Others to Act, (2) Model the Way, (3) Encourage the Heart, (4) Challenge the Process, and (5) Inspire a Vision. Table 7 provides the means and standard deviations for each of the five leadership practices associated with LPI-self survey completed by the science department chairs in this study. While Figure 3 illustrates the means and standard deviations for each leadership practice based on the data collected from the science department chairs.
Table 7. Means and Standard Deviations for the LPI-Self Leadership Practices

<table>
<thead>
<tr>
<th>Leadership Practice</th>
<th>Frequency</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge the Process</td>
<td>47</td>
<td>48.84</td>
<td>8.57</td>
</tr>
<tr>
<td>Enable Others to Act</td>
<td>47</td>
<td>52.65</td>
<td>8.06</td>
</tr>
<tr>
<td>Encourage the Heart</td>
<td>47</td>
<td>50.14</td>
<td>8.11</td>
</tr>
<tr>
<td>Inspire a Shared Vision</td>
<td>47</td>
<td>48.86</td>
<td>8.90</td>
</tr>
<tr>
<td>Model the Way</td>
<td>47</td>
<td>51.84</td>
<td>8.27</td>
</tr>
</tbody>
</table>

Figure 3. Error Chart: Mean and Standard Deviation for Each Leadership Practice
As can be determined by the data in Table 7 and Figure 3, the means on the LPI-Self for each leadership practice for the science department chairs in this study aligned in ranking with the mean rankings presented from the reliability scores of the national sample in Posner’s data analysis (SEE Table 6). Mimicking Posner’s (2010) data, the department chairs surveyed in this study had the highest mean with the practice Enable Others to Act while the lowest mean correlated to the leadership practice Inspiring a Shared Vision. Model the Way was the second most utilized leadership practice of a department chair when examining means followed by Encourage the Heart and Challenge the Process. Figure 3 confirms that none of the data gathered from the science department chairs in regards to each of the five transformational leadership practices proved to be significantly different from each other when demographic data is ignored in the analysis.

Table 8 provides data on the LPI-self statements that showed the highest and lowest means for the science department chairs. A complete listing of the descriptive statistics for the LPI statements by leadership practice is available in Appendix L.

Table 8 shows the highest mean associated with statements on the LPI-self were 9.55. The 9.55 mean for Model the Way applied to the following two questions: (1) I am a personal example of what I expect of others, and (2) I appeal to others to share an exciting dream of the future; while the 9.55 mean for Enable Others to Act applied to the question, ‘I make sure that people are creatively rewarded for their contributions to the success of our projects.’ Both of these transformational leadership practices – Model the
Way and Enable Others to Act - are the top two practices on the LPI-self for the national sample (see Table 6) and within this sample of department chairs (see Table 7).

Table 8. LPI-Self Statements with Highest and Lowest Means

<table>
<thead>
<tr>
<th>Question No.</th>
<th>Practice</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Means</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Model the Way</td>
<td>9.55</td>
<td>1.83</td>
</tr>
<tr>
<td>12</td>
<td>Model the Way</td>
<td>9.55</td>
<td>1.81</td>
</tr>
<tr>
<td>15</td>
<td>Enable Others to Act</td>
<td>9.55</td>
<td>1.81</td>
</tr>
<tr>
<td>5</td>
<td>Enable Others to Act</td>
<td>9.47</td>
<td>1.83</td>
</tr>
<tr>
<td>6</td>
<td>Encourage the Heart</td>
<td>8.96</td>
<td>1.83</td>
</tr>
<tr>
<td>Lowest Means</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Inspire a Shared Vision</td>
<td>7.49</td>
<td>1.66</td>
</tr>
<tr>
<td>8</td>
<td>Inspire a Shared Vision</td>
<td>7.65</td>
<td>1.64</td>
</tr>
<tr>
<td>26</td>
<td>Encourage the Heart</td>
<td>7.69</td>
<td>1.63</td>
</tr>
<tr>
<td>14</td>
<td>Challenge the Process</td>
<td>7.85</td>
<td>1.61</td>
</tr>
<tr>
<td>17</td>
<td>Model the Way</td>
<td>7.91</td>
<td>1.61</td>
</tr>
</tbody>
</table>

The LPI statements that received the lowest means were connected to Inspire a Shared Vision and Encourage the Heart. The Inspire a Shared Vision questions asked, (1) "What can I learn?" when things don't go as expected (mean = 7.49), and (2) I challenge people to try out new and innovative ways to do their work (mean = 7.65);
while the Encourage the Heart questions stated, ‘I am clear about the philosophy of leadership’ (mean = 7.69). Inspire a Shared Vision is the leadership practice that is exhibited the least by leaders surveyed with the LPI-self (see Table 7).

**Self-Perceptions of Transformational Leadership Practices of Science**

**Department Chairs Studied with Demographic Data**

Table 9 depicts normative data based on LPI-self and gender from a national sample. The means and standard deviations for each leadership practice are segregated by gender in the table (Posner, 2010).

Table 9: Normative Means and Standard Deviations by Gender for Leadership Practices for LPI-Self

<table>
<thead>
<tr>
<th>Leadership Practice</th>
<th>Female Mean</th>
<th>Female Std Deviation</th>
<th>Male Mean</th>
<th>Female Std Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge the Process</td>
<td>45.84</td>
<td>10.02</td>
<td>44.46</td>
<td>9.32</td>
</tr>
<tr>
<td>Enable Others to Act</td>
<td>50.30</td>
<td>8.44</td>
<td>49.20</td>
<td>8.05</td>
</tr>
<tr>
<td>Encourage the Heart</td>
<td>47.04</td>
<td>10.85</td>
<td>45.54</td>
<td>10.18</td>
</tr>
<tr>
<td>Inspire a Shared Vision</td>
<td>45.19</td>
<td>11.10</td>
<td>43.36</td>
<td>10.67</td>
</tr>
<tr>
<td>Model the Way</td>
<td>47.72</td>
<td>9.21</td>
<td>46.55</td>
<td>8.60</td>
</tr>
</tbody>
</table>

(Posner, 2010)

Table 10 and Figure 4 uses gender as a way to compare transformational leadership behaviors of the science department chairs in this study even further.
Table 10. Means and Standard Deviations by Gender for Leadership Practices for LPI-Self

<table>
<thead>
<tr>
<th>Leadership Practice</th>
<th>Female Mean</th>
<th>Female Std Deviation</th>
<th>Male Mean</th>
<th>Male Std Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (N)</td>
<td>N = 25</td>
<td></td>
<td>N = 22</td>
<td></td>
</tr>
<tr>
<td>Challenge the Process</td>
<td>51.36</td>
<td>4.51</td>
<td>49.28</td>
<td>5.64</td>
</tr>
<tr>
<td>Enable Others to Act</td>
<td>53.86</td>
<td>5.34</td>
<td>52.44</td>
<td>4.71</td>
</tr>
<tr>
<td>Encourage the Heart</td>
<td>51.14</td>
<td>7.95</td>
<td>50.12</td>
<td>5.07</td>
</tr>
<tr>
<td>Inspire a Shared Vision</td>
<td>49.77</td>
<td>5.78</td>
<td>49.00</td>
<td>6.19</td>
</tr>
<tr>
<td>Model the Way</td>
<td>53.36</td>
<td>4.46</td>
<td>51.32</td>
<td>4.73</td>
</tr>
</tbody>
</table>

Figure 4. Means at 95% Confidence for LPI-Self Leadership Practices by Gender & Age
By looking at the sub-scores for gender, the males which composed 46.81% of the studied population had means for each leadership practice that aligned in ranking with the mean rankings – Enable Others to Act, Model the Way, Encourage the Heart, Challenge the Process, and Inspire a Shared Vision – presented from the reliability scores of the national sample in Posner’s (2010) data analysis of gender on the LPI-self (see Table 9). However the 53.19% of the female within the studied population had mean rankings that correlated to neither the data presented in the national sample or the male science department chairs studied within the sample. The females had a slightly higher mean for the practice of Challenging the Process than they did for Encouraging the Heart. Thus the female population of science department chairs had mean rankings as follows: (1) Enable Others to Act, (2) Model the Way, (3) Challenge the Process, (4) Encourage the Heart, and (5) Inspire a Shared Vision.

Even though the means have a difference in value between the males and female science department chairs’ leadership practices with having the higher means in all practices none of the differences are great enough to allow the data to be statistically significant. In Figure 4, when the standard deviations for each leadership practice is studied by gender the box plots informs the researcher that the regions overlap thus making the results insignificant to draw any conclusions. The box plots (see Figure 4) provide evidence to support the claim that the relationships between gender and leadership practice is not statistically significant for any of the behaviors.

The box plot in Figure 5 compares the score range for females in contrast to the males. Through the analysis of the box plot it can be stated that females have a wider
range of mean values than the male population. Thus the female population of science department chairs has a greater variance in terms of high and low values for the mean when examine the five transformational leadership practices together.

Figure 5. Box Plot for Score Range on the LPI-Self by Gender

Table 11 and Figure 6 convey the means of the LPI-self leadership practices based on the age of the science department chairs. On the demographics survey, the science department chairs were asked to check which age-range they fell within. The ranges were (1) under 30 years of age, (2) age 30-39, (3) age 40-49, and (4) age 50-59. Since only one participant was under the age of 30, the data for this participant was removed from this section of the analysis.
Table 11. Means and Standard Deviations by Age Range for Leadership Practices as Reported by Science Department Chairs

<table>
<thead>
<tr>
<th>Leadership Practice</th>
<th>Mean (Std. Deviation) Age 30-39</th>
<th>Mean (Std. Deviation) Age 40-49</th>
<th>Mean (Std. Deviation) Age 50-59</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>18</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>Challenge the Process</td>
<td>50.00 (6.02)</td>
<td>50.63 (4.61)</td>
<td>49.38 (5.63)</td>
</tr>
<tr>
<td>Enable Others to Act</td>
<td>51.94 (6.70)</td>
<td>53.32 (3.61)</td>
<td>55.00 (3.82)</td>
</tr>
<tr>
<td>Encourage the Heart</td>
<td>50.67 (7.00)</td>
<td>50.05 (6.79)</td>
<td>51.00 (5.95)</td>
</tr>
<tr>
<td>Inspire a Shared Vision</td>
<td>48.78 (5.90)</td>
<td>49.42 (6.27)</td>
<td>49.50 (6.39)</td>
</tr>
<tr>
<td>Model the Way</td>
<td>51.36 (4.99)</td>
<td>52.79 (4.49)</td>
<td>52.75 (5.04)</td>
</tr>
</tbody>
</table>

The data in Figure 6 depicts three pertinent pieces of information. First it can be seen that the trend for mean rankings according to the national sample (see Table 6) of the LPI-self subscores – (1) Enable Others to Act, (2) Model the Way, (3) Encourage the Heart, (4) Challenge the Process, and (5) Inspire a Shared Vision – is maintained when leadership practices of science department chairs is examined from an age perspective. A primary finding from the above data is that the only age group that does not maintain the normative sequential ranking is the 40-49 year olds. The means for this group of science department chairs shows that their mean associated with Challenge the Process is greater...
than the mean for Encourage the Heart which disrupts the normative sequence.

Second, the data shows that the eldest age group (50-59) maintained the highest mean in all practices except for Challenge the Process. Challenge the Process is also the only practice where the 50-59 year old age group is below both of the other age groups.

Lastly, the data in Figure 6 shows a trend that the mean increases with age for three leadership practices – Enable Others to Act, Inspire a Shared Vision, and Model the Way – informing the researcher that older participants tend to have certain differences from younger participants in the study although this differences shown through the trends in Figure 6 do not make the data statistically significant.

Figure 6. LPI-Self Mean Sub-Score and Age Range

Box plots where analyzed to determine if the data presented for the age groups were statistically significant. Independently, Figures 7-11 depict box plots of each leadership practice and the three age groupings examined in this study.
Figure 7. Box Plot of Model the Way for LPI-Self with Age Groupings

Figure 8. Box Plot of Inspire a Shared Vision for LPI-Self with Age Groupings
Figure 9. Box Plot of Challenge the Process for LPI-Self with Age Groupings

Figure 10. Box Plot of Enable Others to Act for LPI-Self with Age Groupings
Figure 11. Box Plot of Encourage the Heart for LPI-Self for Age Groupings

The box plots (see Figures 7-11) allow the researcher to contend that the data related to age groupings and specific leadership practices does not provide statistically significant data to make any claims. However, the box plots do present a trend. The age range of 50-59 shows less variation in their responses in comparison to the other two age groupings in four out of the five leadership practice categories. The only leadership practice where the variations is not less than the other two age ranges is Challenge the Process.

Continuing to examine leadership behaviors in lieu of demographics, each leadership practice was examined based on both the gender and age of the science department chair. Again the three age ranges studied were (1) 30-39, (2) 40-49, and (3) 50-59. Table 12 and Figure 12 depict the mean for each gender with each age group, and
Table 13 provides the result of a two-way ANOVA with gender and age as factors for each leadership practice.

Table 12. Means for Leadership Practices Based on Age Groupings and Gender of Science Department Chairs

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge the Process</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Female</td>
<td>51.67</td>
<td>48.33</td>
<td>51.40</td>
<td>49.78</td>
<td>50.33</td>
<td>48.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enable Others to Act</td>
<td>53.89</td>
<td>50.00</td>
<td>52.80</td>
<td>53.89</td>
<td>57.33</td>
<td>53.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>10</td>
<td>50.33</td>
<td>50.00</td>
<td>50.11</td>
<td>55.33</td>
<td>48.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>9</td>
<td>50.00</td>
<td>50.00</td>
<td>50.00</td>
<td>50.00</td>
<td>50.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encourage the Heart</td>
<td>51.00</td>
<td>50.33</td>
<td>50.00</td>
<td>50.11</td>
<td>55.33</td>
<td>48.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspire a Shared Vision</td>
<td>49.22</td>
<td>48.33</td>
<td>49.30</td>
<td>49.56</td>
<td>53.00</td>
<td>47.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model the Way</td>
<td>52.89</td>
<td>49.67</td>
<td>53.10</td>
<td>52.44</td>
<td>55.67</td>
<td>51.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 12 and Figure 12 the females in age group 30-39 have slightly higher means than the males in all categories. Within this age grouping both the female and male populations follow the normative ranking of means based on gender (see Table 9). In the age grouping 40-49, the ranking of the leadership practices by gender do not align with each other. The male data on mean rankings of leadership practices for the 40-49 age range follows the normative data in Table 9, but the set data on leadership practices associated with females of this age grouping does not follow the normative data. When studying the eldest age grouping (50-59) it is obvious that the means for females in each leadership practice is higher than the means for the male population with neither population following the normative trend of mean rankings for leadership practices.
Additionally as seen in Figure 12, the range for the numerical value for the means for both males and females is greatest in this age grouping in comparison to the other two age groupings. Although for the most part, females tended to exhibit a greater mean for each leadership practice than the male population, this difference was not significant as evident in the box plots (see Figure 12). There was as much variability among each gender as there was between each gender but none of the differences are significant.

Figure 12. Box Plot of Means by Gender and Leadership Practice for Each Age Range

Table 13 portrays the results of a two-way ANOVA test completed using the LPI-self data for the three age groups and gender.
Table 13. Two Way ANOVA Test: Gender and Age for Leadership Practices for the LPI-Self

<table>
<thead>
<tr>
<th>Leadership Practice</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Challenge the Process</strong></td>
<td>Gender</td>
<td>43.558</td>
<td>1</td>
<td>43.558</td>
<td>1.473</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>6.572</td>
<td>2</td>
<td>3.286</td>
<td>0.111</td>
</tr>
<tr>
<td></td>
<td>Gender &amp; Age</td>
<td>8.083</td>
<td>2</td>
<td>4.042</td>
<td>0.137</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>1153.422</td>
<td>39</td>
<td>29.575</td>
<td></td>
</tr>
<tr>
<td><strong>Enable Others to Act</strong></td>
<td>Gender</td>
<td>44.156</td>
<td>1</td>
<td>44.156</td>
<td>1.723</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>67.120</td>
<td>2</td>
<td>33.560</td>
<td>1.310</td>
</tr>
<tr>
<td></td>
<td>Gender &amp; Age</td>
<td>66.137</td>
<td>2</td>
<td>33.068</td>
<td>1.291</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>999.244</td>
<td>39</td>
<td>25.622</td>
<td></td>
</tr>
<tr>
<td><strong>Encourage the Heart</strong></td>
<td>Gender</td>
<td>58.017</td>
<td>1</td>
<td>58.017</td>
<td>1.244</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>17.726</td>
<td>2</td>
<td>8.863</td>
<td>0.190</td>
</tr>
<tr>
<td></td>
<td>Gender &amp; Age</td>
<td>70.644</td>
<td>2</td>
<td>35.322</td>
<td>0.757</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>1818.756</td>
<td>39</td>
<td>46.635</td>
<td></td>
</tr>
<tr>
<td><strong>Inspire a Shared Vision</strong></td>
<td>Gender</td>
<td>40.194</td>
<td>1</td>
<td>40.194</td>
<td>1.028</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>11.292</td>
<td>2</td>
<td>5.646</td>
<td>0.144</td>
</tr>
<tr>
<td></td>
<td>Gender &amp; Age</td>
<td>46.771</td>
<td>2</td>
<td>23.386</td>
<td>0.598</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>1525.078</td>
<td>39</td>
<td>39.105</td>
<td></td>
</tr>
<tr>
<td><strong>Model the Way</strong></td>
<td>Gender</td>
<td>75.525</td>
<td>1</td>
<td>75.525</td>
<td>3.367</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>30.977</td>
<td>2</td>
<td>15.489</td>
<td>0.691</td>
</tr>
<tr>
<td></td>
<td>Gender &amp; Age</td>
<td>27.081</td>
<td>2</td>
<td>13.541</td>
<td>0.604</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>874.678</td>
<td>39</td>
<td>22.428</td>
<td></td>
</tr>
<tr>
<td><strong>Combined Leadership Practices</strong></td>
<td>Gender</td>
<td>1288.247</td>
<td>1</td>
<td>1288.247</td>
<td>2.488</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>336.005</td>
<td>2</td>
<td>168.002</td>
<td>0.324</td>
</tr>
<tr>
<td></td>
<td>Gender &amp; Age</td>
<td>697.315</td>
<td>2</td>
<td>348.657</td>
<td>0.673</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>20197.422</td>
<td>39</td>
<td>517.883</td>
<td></td>
</tr>
</tbody>
</table>

The results of the two-way ANOVA test (see Table 13) confirm that there was no statistically significant data collected in this study when investigating gender and age for each leadership practice. Therefore, age in relation to gender does not appear to relate
to how science department chairs perceive themselves on the five transformational leadership practices of the LPI-Self based on the fact that there were no significant correlations (p < 0.05) between age and gender on each of the leadership practices.

In addition to gender and age, science department chairs were asked to provide the number of years they had been serving as a department chair regardless of the number of schools they had served in while in the position of department chair. Table 14 provides various categories for years of experience with frequency for the participants in this study. The categories for years of experiences are as follows: (1) 1-3 years of experience, (2) 4-6 years of experience, (3) 7-9 years of experience, and (4) 10 plus years of experience. Since there was only one participant in each of the three categories that followed the 10-12 years of experience range the researcher added these individuals to the 10-12 year category and renamed the category 10 plus years of experience. Additionally, Table 14 provides the mean for each leadership practice by years of experience.
Table 14. Means for Leadership Practices Based on Years of Experience as Science Department Chair

<table>
<thead>
<tr>
<th>Leadership Practice</th>
<th>1-3 Years</th>
<th>4-6 Years</th>
<th>7-9 Years</th>
<th>10+ Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (N)</td>
<td>14</td>
<td>11</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Challenge the Process</td>
<td>51.55</td>
<td>50.52</td>
<td>50.88</td>
<td>50.52</td>
</tr>
<tr>
<td>Enable Others to Act</td>
<td>52.02</td>
<td>51.66</td>
<td>54.00</td>
<td>54.60</td>
</tr>
<tr>
<td>Encourage the Heart</td>
<td>52.68</td>
<td>50.64</td>
<td>53.52</td>
<td>49.02</td>
</tr>
<tr>
<td>Inspire a Shared Vision</td>
<td>50.34</td>
<td>49.32</td>
<td>50.70</td>
<td>47.22</td>
</tr>
<tr>
<td>Model the Way</td>
<td>52.02</td>
<td>52.68</td>
<td>55.02</td>
<td>50.58</td>
</tr>
</tbody>
</table>

Table 15 depicts a two-way ANOVA test based on the science department chairs’ years of experience in the position across both genders as they relate to the five leadership practices on the LPI-Self instrument.
Table 15. Two-Way ANOVA Test: Years of Experience as Science Department Chair and Gender for Leadership Practices

<table>
<thead>
<tr>
<th>Leadership Practice</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge the Process Gender</td>
<td>49.010</td>
<td>1</td>
<td>49.010</td>
<td>1.752</td>
<td>0.193</td>
</tr>
<tr>
<td></td>
<td>DC Years Exp.</td>
<td>83.692</td>
<td>3</td>
<td>27.897</td>
<td>0.997</td>
</tr>
<tr>
<td>Enable Others to Act Gender</td>
<td>7.352</td>
<td>1</td>
<td>7.352</td>
<td>0.340</td>
<td>0.563</td>
</tr>
<tr>
<td></td>
<td>DC Years Exp.</td>
<td>256.217</td>
<td>3</td>
<td>85.406</td>
<td>3.947</td>
</tr>
<tr>
<td>Enable Others to Act Gender</td>
<td>53.762</td>
<td>3</td>
<td>17.921</td>
<td>0.828</td>
<td>0.486</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>843.833</td>
<td>39</td>
<td>21.637</td>
<td></td>
</tr>
<tr>
<td>Inspire a Shared Vision Gender</td>
<td>6.804</td>
<td>1</td>
<td>6.804</td>
<td>0.152</td>
<td>0.699</td>
</tr>
<tr>
<td></td>
<td>DC Years Exp.</td>
<td>105.574</td>
<td>3</td>
<td>35.191</td>
<td>0.785</td>
</tr>
<tr>
<td>Inspire a Shared Vision Gender</td>
<td>49.362</td>
<td>3</td>
<td>16.454</td>
<td>0.367</td>
<td>0.777</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>1747.869</td>
<td>39</td>
<td>44.817</td>
<td></td>
</tr>
<tr>
<td>Model the Way Gender</td>
<td>9.130</td>
<td>1</td>
<td>9.130</td>
<td>0.480</td>
<td>0.493</td>
</tr>
<tr>
<td></td>
<td>DC Years Exp.</td>
<td>200.321</td>
<td>3</td>
<td>66.774</td>
<td>3.508</td>
</tr>
<tr>
<td>Model the Way Gender</td>
<td>8.208</td>
<td>3</td>
<td>2.736</td>
<td>0.144</td>
<td>0.933</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>742.392</td>
<td>39</td>
<td>19.036</td>
<td></td>
</tr>
</tbody>
</table>

The results of the two-way ANOVA test for science department chairs’ years of experience linked to each leadership practice concludes that there were significant correlations with science department chairs’ years of experience and two of the leadership practices. In order to be significant, the findings from the t-test had to result in p<0.05 significance level. The leadership behaviors that significantly correlated with a department chairs’ years of experience were Model the Way (p = 0.0204) and Enable
Others to Act ($p = 0.015$). From these results, it can be concluded that there are significant differences in leadership behaviors for science department chairs when years of experience is analyzed in relation to the transformational leadership practices of Model the Way or Enable Others to Act no matter what gender. The other three leadership practices did not show significant relationships ($p>0.05$) between leadership behaviors and years of experience as a science department chair as measured by the LPI-Self survey.

It can also be concluded based on a multiple comparisons testing that for the leadership practice of Enable Others to Act there is a significant difference ($p = 0.012$) in how science department chairs with 1-3 years of experience versus 7-9 years of experience employ the commitments associated with this transformational leadership practice. Science department chairs with 7-9 years of experience had a significantly higher mean for Enable Others to Act than those with 1-3 years of experience.

Figures 13-17 serve as further evidence to support the outcomes noted above from Table 15. The categories for years of experience are identified on the box plots as numbers. The numbers on the box plot corresponding to the following categories: (1) 1-3 years of experience, (2) 4-6 years of experience, (3) 7-9 years of experience, and (4) 10 or more years of experience. Figure 14 illustrates the significance of science department chairs’ years of experience as it relates to Enable Others to Act, and Figure 17 shows the same significance but for the transformational behavior of Model the Way.
Figure 13. Box Plot for Challenge the Process and Years of Experience as Science Department Chair

Figure 14. Box Plot for Enable Others to Act and Years of Experience as Science Department Chair
Figure 15. Box Plot for Encourage the Heart and Years of Experience as Science Department Chair

Figure 16. Box Plot for Inspire a Shared Vision and Years of Experience as a Science Department Chair
Table 16 contains the descriptive statistics for the years of experience of a department chair and gender. The years of experience are divided into categories: (1) 1-3 years of experience, (2) 4-6 years of experience, (3) 7-9 years of experience and (4) 10 years of experience.
Table 16. Means and Standard Deviations for Science Department Chairs’ Years of Experience by Gender and Leadership Practices

<table>
<thead>
<tr>
<th>Gender</th>
<th>Years of Experience</th>
<th>Frequency (N)</th>
<th>Challenge Mean (Std)</th>
<th>Enable Mean (Std)</th>
<th>Encourage Mean (Std)</th>
<th>Inspire Mean (Std)</th>
<th>Model Mean (Std)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1 – 3</td>
<td>8</td>
<td>48.63 (5.90)</td>
<td>49.88 (4.55)</td>
<td>50.13 (5.30)</td>
<td>49.00 (7.25)</td>
<td>48.63 (5.15)</td>
</tr>
<tr>
<td></td>
<td>4 – 6</td>
<td>7</td>
<td>50.86 (7.60)</td>
<td>53.57 (5.94)</td>
<td>52.00 (4.20)</td>
<td>50.43 (5.16)</td>
<td>54.28 (3.68)</td>
</tr>
<tr>
<td></td>
<td>7 – 9</td>
<td>3</td>
<td>49.67 (3.79)</td>
<td>55.67 (3.21)</td>
<td>52.67 (5.86)</td>
<td>48.67 (6.66)</td>
<td>53.00 (3.60)</td>
</tr>
<tr>
<td></td>
<td>10+</td>
<td>7</td>
<td>48.29 (4.37)</td>
<td>52.86 (3.18)</td>
<td>47.14 (4.85)</td>
<td>47.71 (6.80)</td>
<td>50.71 (4.34)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>25</td>
<td>49.28 (5.64)</td>
<td>52.44 (4.71)</td>
<td>50.12 (5.07)</td>
<td>49.00 (6.19)</td>
<td>51.32 (4.73)</td>
</tr>
<tr>
<td>Female</td>
<td>1 – 3</td>
<td>6</td>
<td>49.17 (4.62)</td>
<td>50.33 (7.81)</td>
<td>50.17 (9.30)</td>
<td>47.33 (4.32)</td>
<td>51.00 (4.77)</td>
</tr>
<tr>
<td></td>
<td>4 – 6</td>
<td>4</td>
<td>54.50 (2.08)</td>
<td>55.75 (1.71)</td>
<td>55.50 (3.87)</td>
<td>52.50 (4.20)</td>
<td>56.25 (1.89)</td>
</tr>
<tr>
<td></td>
<td>7 – 9</td>
<td>11</td>
<td>51.27 (4.86)</td>
<td>55.82 (3.03)</td>
<td>50.18 (8.70)</td>
<td>49.82 (6.93)</td>
<td>53.91 (4.59)</td>
</tr>
<tr>
<td></td>
<td>10+</td>
<td>1</td>
<td>53.00 (5.30)</td>
<td>46.00 (7.95)</td>
<td>50.00 (5.78)</td>
<td>53.00 (4.59)</td>
<td>50.00 (4.45)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>22</td>
<td>51.36 (4.51)</td>
<td>53.86 (5.34)</td>
<td>51.14 (7.95)</td>
<td>49.77 (5.78)</td>
<td>53.36 (4.45)</td>
</tr>
</tbody>
</table>
The final piece of demographic information relevant to science department chairs that was examined was department size. Table 17 provides information on the number of teachers a science department chair has within his or her department.

Table 17. Population of Science Departments

<table>
<thead>
<tr>
<th>Number of Teachers</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-12 Teachers</td>
<td>11</td>
<td>22.45</td>
</tr>
<tr>
<td>13-15 Teachers</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16-19 Teachers</td>
<td>13</td>
<td>26.53</td>
</tr>
<tr>
<td>20-23 Teachers</td>
<td>11</td>
<td>22.45</td>
</tr>
<tr>
<td>24-27 Teachers</td>
<td>5</td>
<td>10.20</td>
</tr>
<tr>
<td>28-31 Teachers</td>
<td>1</td>
<td>2.04</td>
</tr>
<tr>
<td>32-34 Teachers</td>
<td>1</td>
<td>2.04</td>
</tr>
<tr>
<td>35+ Teachers</td>
<td>5</td>
<td>10.20</td>
</tr>
</tbody>
</table>

Observed Perceptions of Transformational Leadership Practices of Science Department Chairs by Principals

Table 18 and Figure 18 provide the means and standard deviations for each of the five leadership practices associated with Posner’s (2010) normative data for the LPI-observer survey (see Table 6). The order of leadership practices ranking according to the means for the national sample of the LPI-observer survey are as follows: (1) Enable Others to Act, (2) Model the Way, (3) Encourage the Heart, (4) Challenge the Process, and (5) Inspire a Vision (Posner, 2010).
Table 18. Means and Standard Deviations for Leadership Practices Based on Principals’ Observations

<table>
<thead>
<tr>
<th>Leadership Practice</th>
<th>Frequency</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge the Process</td>
<td>28</td>
<td>39.80</td>
<td>22.57</td>
</tr>
<tr>
<td>Enable Others to Act</td>
<td>28</td>
<td>41.66</td>
<td>22.44</td>
</tr>
<tr>
<td>Encourage the Heart</td>
<td>28</td>
<td>40.86</td>
<td>22.30</td>
</tr>
<tr>
<td>Inspire a Shared Vision</td>
<td>28</td>
<td>39.94</td>
<td>22.48</td>
</tr>
<tr>
<td>Model the Way</td>
<td>28</td>
<td>40.89</td>
<td>22.24</td>
</tr>
</tbody>
</table>

Figure 18. Means for Leadership Practices Based on Principals’ Observations of Science Department Chairs

The mean data provided by the principals for the five observed leadership practices of the science department chairs shown in Table 18 and Figure 18 almost parallels the mean rankings communicated within the national sample (see Table 6) in the
data analysis completed by Posner (2010) on the LPI-observer instrument. The difference between the two samples is that the observed means for the practice of Inspire a Shared Vision was slightly higher than the observed means for Challenge the Process which is the reverse of the national sample. Based on the mean values, the principals observed the science department chairs to employ the practice of Enable Others to Act which was similar to the national sample followed by Model the Way then Encourage the Heart. The principals’ observation of the science department chair in terms of the practices Model the Way and Encourage the Heart were extremely close. These two leadership behaviors had a mean difference of only 0.03 when using the data collected from the principals, observed perceptions.

Comparison of the Responses Between the Science Department Chairs and the Principals

Table 19 and Figure 19 provide the means for each of the leadership practices as perceived by the science department chairs and as observed by the principals. Then the table shares the differences between the means provided by the two groups of participants. The principals and science department chairs in these two sample populations do not necessarily work at the same secondary public high school, thus this data has no correlation between the perceived and observed perceptions.
Table 19. Comparison of Means for Leadership Practices of Science Department Chairs based on Science Department Chairs’ Self-Perceptions and Principals’ Observed Perceptions

<table>
<thead>
<tr>
<th>Leadership Practice</th>
<th>Dept. Chairs (n=47)</th>
<th>Principals (n=28)</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge the Process</td>
<td>49.84</td>
<td>39.80</td>
<td>10.04</td>
</tr>
<tr>
<td>Enable Others to Act</td>
<td>52.65</td>
<td>41.66</td>
<td>11.00</td>
</tr>
<tr>
<td>Encourage the Heart</td>
<td>50.14</td>
<td>40.86</td>
<td>9.29</td>
</tr>
<tr>
<td>Inspire a Shared Vision</td>
<td>48.86</td>
<td>39.94</td>
<td>8.91</td>
</tr>
<tr>
<td>Model the Way</td>
<td>51.84</td>
<td>40.89</td>
<td>10.95</td>
</tr>
</tbody>
</table>

Figure 19. Comparison of Means for Observed Leadership Practices of Science Department Chairs
The analysis of the data in Table 19 and Figure 19 provides evidence of the self-perceptions of the department chairs and the observed perceptions of the department chair by the principal. Based on the means, the researcher can conclude that overall the science department self-perceptions are higher than the observed perceptions of the principals in all five leadership practices. Although the participation from the principals was less (n=28) than the science department chairs’ participation frequency (n=47), the principals’ observations of the science department chairs ability to perform transformational practices was perceived to be at a lesser level based on the stated means.

From the data in Table 19 and Figure 19, it can be concluded that science department chairs in this study view themselves as imposing greater transformational behaviors than the participating building level principals observe them performing in schools, but these differences are not statistically significant.

**Correlations Between Self-Perceptions and Observed Perceptions of Science Department Chairs’ Transformational Leadership Behaviors**

The last research question is attempting to understand the relationship between the science department chairs’ self-perceptions of their transformational leadership practices and the principals’ observed perceptions of the science department chairs’ transformational leadership practices. In order to answer the fourth question, data was isolated for principals and science department chairs who had matched by school. Within the overall collected data set, there were only thirteen pairs of principals and science department chairs. Tables 20-22 are the results of paired t-tests on the aforementioned data for each leadership practice.
Table 20. Means and Standard Deviations for Each Leadership Practice for Correlating Science Department Chairs and Principals (N = 13)

<table>
<thead>
<tr>
<th>Pair</th>
<th>Leadership Practice</th>
<th>Chair Mean</th>
<th>Standard Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Challenge the Process</td>
<td>51.15</td>
<td>4.83</td>
<td>1.34</td>
</tr>
<tr>
<td></td>
<td>Principal</td>
<td>48.92</td>
<td>12.77</td>
<td>3.54</td>
</tr>
<tr>
<td>2</td>
<td>Enable Others to Act</td>
<td>56.15</td>
<td>3.48</td>
<td>0.966</td>
</tr>
<tr>
<td></td>
<td>Principal</td>
<td>53.77</td>
<td>5.15</td>
<td>1.43</td>
</tr>
<tr>
<td>3</td>
<td>Encourage the Heart</td>
<td>52.69</td>
<td>5.36</td>
<td>1.49</td>
</tr>
<tr>
<td></td>
<td>Principal</td>
<td>49.31</td>
<td>10.61</td>
<td>2.94</td>
</tr>
<tr>
<td>4</td>
<td>Inspire a Shared Vision</td>
<td>49.84</td>
<td>6.71</td>
<td>1.86</td>
</tr>
<tr>
<td></td>
<td>Principal</td>
<td>47.54</td>
<td>13.79</td>
<td>3.83</td>
</tr>
<tr>
<td>5</td>
<td>Model the Way</td>
<td>53.92</td>
<td>4.48</td>
<td>1.24</td>
</tr>
<tr>
<td></td>
<td>Principal</td>
<td>50.46</td>
<td>10.65</td>
<td>2.95</td>
</tr>
<tr>
<td>6</td>
<td>All Practices</td>
<td>263.77</td>
<td>18.53</td>
<td>5.14</td>
</tr>
<tr>
<td></td>
<td>Principal</td>
<td>250.00</td>
<td>49.40</td>
<td>13.70</td>
</tr>
</tbody>
</table>
Table 21. Science Department Chair and Principals Paired Sample Correlations for Each Leadership Practice (N = 13)

<table>
<thead>
<tr>
<th>Pair</th>
<th>Leadership Practice</th>
<th>Correlation</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Challenge the Process</td>
<td>0.544</td>
<td>0.055</td>
</tr>
<tr>
<td>2</td>
<td>Enable Others to Act</td>
<td>-0.244</td>
<td>0.422</td>
</tr>
<tr>
<td>3</td>
<td>Encourage the Heart</td>
<td>-0.571</td>
<td>0.041</td>
</tr>
<tr>
<td>4</td>
<td>Inspire a Shared Vision</td>
<td>-0.051</td>
<td>0.868</td>
</tr>
<tr>
<td>5</td>
<td>Model the Way</td>
<td>-0.209</td>
<td>0.494</td>
</tr>
<tr>
<td>6</td>
<td>All Practices</td>
<td>-0.221</td>
<td>0.469</td>
</tr>
</tbody>
</table>

In Table 21, it is evident that the paired sample produces statistically significant data for the leadership practice Encourage the Heart. Due to this negative correlation, the researcher claims there is a not a relationship between the self-perceptions of the science department chairs transformational behaviors associated with Encourage the Heart in comparison to the observed perceptions of the science department chairs transformational behaviors by the principals. This conclusion is drawn due to the 0.041 significance determined by the paired samples correlation. Additionally, it can be noted that the leadership practice Challenge the Process, although it does not produce statistically
significant data it is almost a significant positive correlation with a 0.055 confidence level.

Table 22. Science Department Chair and Principals Paired Sample Test for Each Leadership Practice (N = 13)

<table>
<thead>
<tr>
<th>Leadership Practice</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Std. Error Mean</th>
<th>t</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge the Process</td>
<td>2.23</td>
<td>10.93</td>
<td>3.03</td>
<td>0.736</td>
<td>0.476</td>
</tr>
<tr>
<td>Enable Others to Act</td>
<td>2.38</td>
<td>6.89</td>
<td>1.91</td>
<td>1.249</td>
<td>0.236</td>
</tr>
<tr>
<td>Encourage the Heart</td>
<td>3.38</td>
<td>14.36</td>
<td>3.98</td>
<td>0.850</td>
<td>0.412</td>
</tr>
<tr>
<td>Inspire a Shared Vision</td>
<td>2.31</td>
<td>15.64</td>
<td>4.34</td>
<td>0.532</td>
<td>0.605</td>
</tr>
<tr>
<td>Model the Way</td>
<td>3.46</td>
<td>12.39</td>
<td>3.44</td>
<td>1.008</td>
<td>0.334</td>
</tr>
<tr>
<td>All Practices</td>
<td>13.77</td>
<td>56.46</td>
<td>15.66</td>
<td>0.879</td>
<td>0.396</td>
</tr>
</tbody>
</table>

The final analysis of the paired data was a paired samples test with two-tailed significance. The results of this test (see Table 22) did not produce any statistically significant data. Therefore, relationships cannot be claimed to exist between the self-perceptions of the science department chairs transformational leadership behaviors and the observed perceptions of the transformational leadership behaviors of the science department chair by the principals.
CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

This research study was conducted to determine the association between the transformational leadership practices of formal teacher leaders – science department chairs – as perceived by both the science department chairs themselves and the principals who supervise the department chairs. These perceptions of transformational behaviors were measured by the Leadership Practice Inventory (LPI) developed by Kouzes and Posner. The science department chairs completed the LPI-Self questionnaire whereas the principals were surveyed using the LPI-Observer instrumentation. The collected data focused on transformational leadership practices (behavior) because the researcher was trying to determine to what extent formalized teacher leaders, specifically department chairs, impose transformational practices. According to Wilson and Corcoran (1988), department chairs in secondary schools as well as department members play leadership roles in effective high schools. However, the leadership talents and skills of the department chair do not become utilized fully but there is a necessity for them to exhibit transformational leadership behaviors (Weller, 2001).

Furthermore, this research study examined several demographic characteristics of the science department chairs, including, years of experience, gender, age, highest degree attained, and current department size. These characteristics were examined because the researcher not only wanted to study the group of science department chairs as a whole,
but also the researcher wanted to determine to what extent self-perceptions of transformational leadership behaviors as measured by the LPI instrument connected to the various subgroups compiled from the demographic characteristics.

Each of the previous chapters highlighted the multiple components of this research study. The first chapter was an introduction to the study that provided information on the significance, purpose, structure, and limitations of the study. The literature associated with the study was reviewed in Chapter II. This chapter gave an overview on the numerous definitions of leadership as it relates to education as well as how leadership can shift school cultures. This chapter then highlighted defining characteristics of both transactional and transformational leadership while showcasing the interdependent relationship of these two leadership models. Additionally, it provided relevant information on both teacher leadership and distributive leadership. The chapter culminated by examining the role and characteristics of the department chair as it parallels these four leadership models followed by a summary on gender as it relates to leadership style.

The third chapter outlined the research questions and the methodology that would be followed to collect data. Included in this chapter were the questions, limitations, sample population, instrumentation and protocols that were to be followed to secure informed consent and collection of data. The fourth chapter contains the findings and analysis of the data from the research study.
The last chapter of the research study will be structured as follows: (1) discussion of findings and (2) recommendations for future study. The crux of the study was the following overarching research questions:

**Research Question #1:** According to the science department chairs, what are the transformational leadership practices in which science department chairs engage?

**Research Question #2:** According to the principals, what are the transformational leadership practices in which science department chairs engage?

**Research Question #3:** How do background variables such as gender, professional experience, educational level, and age relate to transformational leadership practices of science department chairs as perceived by both science department chairs and principals?

**Research Question #4:** What is the relationship between the science department chairs’ self-perceptions of their transformational leadership practices and the principals’ observed perceptions of the science department chairs transformational leadership practices?

**Findings of the Study**

Two groups of participants – science department chairs and principals – were asked to participate from 126 secondary suburban public schools located between Interstate 80 and the Illinois-Wisconsin border. The science department chairs were asked to respond to the LPI-Self instrument developed by Kouzes and Posner as well as to a demographic questionnaire created by the researcher. Whereas, the principals were asked to respond only to the LPI-Observer instrument developed by Kouzes and Posner.
Forty-seven of the 126 science department chairs completed the survey, representing a 37.30% participation rate for science department chairs. Of the 126 principals surveyed 28 responded which represents a 22.22% response rate. Sixteen of the science department chairs and principals who participated were from the same school building thus providing 12.70% response rate when correlating science department chair and principal by school building. Given the small percentage of schools that had correlating science department chairs and principals, along with the fact that findings cannot be generalized as a perspective of others since science department chairs were self-evaluating, data must be interpreted in light of these limitations.

The science department chairs completed additional questions beyond the LPI-Self survey which allowed the researcher to ascertain demographic characteristics for this group of participants. The group of 47 science department chair was 53.19% male and 46.81% female subjects. The youngest science department chair participant was under 30 years of age which represented 2.1% of the studied sample for this group. The largest age group in the sample of science department chairs was between the ages 40 and 49 compromising 40.43% of the study group while 38.30% of this group was between the ages of 30 and 39.

The first research question asked about the transformational leadership practices in which science department chairs engage. Based on the information received from the subjects in this group, the science department chairs perceive themselves as engaging in all five leadership practices – Enable Others to Act, Model the Way, Encourage the Heart, Challenge the Process, Inspire a Shared Vision – associated with transformational
leadership. The science department chairs in this study reported that the primary transformational behavioral practice they engaged in most often is Enable Others to Act (mean = 52.65) while Inspire a Shared Vision (mean = 48.86) and Challenge the Process (mean = 48.84) represented the behaviors they engaged in the least. Model the Way and Encourage the Heart fall in between Enable Others to Act and the other two practices respectively.

The science department chairs that completed the LPI-self view their strongest transformational behavior as Enable Others to Act. This behavior requires these teacher leaders to build relationships in order to cultivate a collaborative environment while strengthening and empowering others. This practice also indicates that science department chairs foster interdependence through competency but do so while providing visible support. Based on the responses, it appears science department chairs commitments of leadership that are the weakest are envisioning a future, and enlisting others in a common vision through shared hopes and desires. With a mean score that does not stray far from the lowest practice, the other commitments of leadership in which science department chairs scored low are seeking out opportunities to take initiative, examine creative ways to improve, and taking risks to learn through experience all of which belong to Challenge the Process.

The second question of the study sought to determine the transformational leadership practices in which science department chairs engaged based on observations made by building principals. Responses from the participants in this group indicate that there were minimal measurable differences in the engagement level of science
department chair within each the leadership practice witnessed by the principals in comparison to those perceived by the department chair. The principal like the science department chair reported the practice of Enable Others to Act as the most common engagement practice followed by Model the Way and Encourage the Heart.

The principals rated the science department chairs engagement lowest in Challenge the Process. Thus they conveyed that science department chairs do not engage as often in commitments of leadership that involve them taking risks, experimenting, seeking out opportunities, taking initiative, and examining innovative ways to improve.

Similar to the self-perceptions of science department chairs, principals observed department chairs showing low engagement in Inspire a Shared Vision, thus not enlisting others in a common vision via collective goals. Perceptions of leadership practices were almost identically ranked in both groups – science department chairs and principals – with the national sample in Posner’s (2010) data analysis; however, overall means in all practices were substantially lower for the principal group in comparison to the self-perceived level of engagement provided by the science department chair. The researcher does not know if there were variables beyond those of the study that could account for the discrepancies between the two sampled populations studied in this research. The one variable that is known to the researcher is that the sample population of department chairs (n=47) who participated is almost double the sample population of principals (n=26) who participated in study.

The third question of the study focused on demographic information gleaned from the department chairs. Science department chair participants were asked to share years of
experience, gender, age, highest degree attained, and current size of department.

Considering gender, the female science department chairs ranked themselves higher as transformational leaders than male participants (see Table 10 and Figure 4). However, although this trend existed for gender none of the tests performed on the data proved it to be statistically significant. The researcher is incapable of sharing the reasons why females in this study view themselves as stronger transformational leaders in the role of science department chair than the male subgroup. The male participants do view themselves as exhibiting transformational behaviors however they do so to a lesser degree than their female counterparts.

By examining the means for each leadership practice when the population is separated by gender, it became apparent that female science department chairs are more likely to Challenge the Process within an organization than the male participants. Individuals who Challenge the Process seek out opportunities to take initiative or risks while examining innovative ways to improve or learn from their mistakes. Females exhibit a mean for Challenge the Process that is 2.08 higher than the mean for male subgroup. This leadership practice has the greatest difference between male and female means followed by the practice Model the Way (difference = 2.04). Leaders who impose the practice of Challenge tend to learn from error and failures as well as they search for improvement to become better leaders. This study does not state that male science department chairs do not engage in this behavior but that the male population has a lower mean value. Although female science department chairs present themselves to have a higher mean for Challenge the Process, the data does not allow the researcher to claim
there are significant differences between gender and the behavior of Challenge the Process.

The male participants in this study followed the normal sample population when it came to ranking the five transformational leadership practices based on their means, whereas the female participants inverted Challenge the Process and Encourage the Heart in comparison to the national sample presented in Posner’s (2010) analysis. Both subgroups – male and females – scored the leadership practice of Inspire a Shared Vision as the lowest transformational behavior. Based on the mean rankings, the commitments associated with this behavior – envisioning a future, enlisting others in a common vision, attracting others to shared goals and desires – are commitments that science department chairs shows to lesser degree than commitments related to other leadership practices in their role as a department chair. Again this is not to say that science department chairs who participated in this study do not engage in these commitments they simply impose it to a lesser degree than other commitments because this practice has the lowest mean across both genders. In conjunction with Inspire a Shared Vision, the means for this practice showed the lowest difference (0.77) between male and female respondents. When examining gender and transformational leadership practices the data lacked any statistical significance, but did show signs of the aforementioned trends.

The second demographic piece of information utilized as a subgroup in this study was age. The researcher divided the science department chairs into three age groups: (1) 30-39 years, (2) 40-49 years, and (4) 50-59 years. All three groups in the study rated themselves as transformational leaders, but based on means for the leadership practices
the 50-59 year old age group tended to score themselves as more transformational than the other two age groupings except in the practice of Challenge the Process. Even though the practice of Challenge the Process was lower for the 50-59 age group, the difference between the age group of 30-39 was less than the difference between the 40-49 year old age group. It should also be noted that the 50-59 year old age group had only eight participants which is less than half the quantity of participants that composed the other two age groups. The analysis of age proved that there were differences in means between the age groups, but descriptive statistical tests did not provide any significant data to draw conclusions about science department chair leadership practices and age range.

The third demographic factor took into consideration two subgroups: (1) age and (2) gender. The leadership practices were examined as individual entities when these two subgroups were analyzed together. For four out of the five leadership practices – Enable Others to Act, Model the Way, Encourage the Heart, and Inspire a Shared Vision – the mean would decrease for females as they moved from the age group 30-39 to the age group of 40-49, but then the mean increased for the 50-59 year old group of females. Within the leadership practice of Challenge the Process, the mean continuously declined for females in the eldest age grouping. Females in the age grouping 30-39 have higher perceptions of themselves for leadership practice of Challenge the Process than females between the ages of 40-59.

Instead of showing a concave pattern similar to females the data for age as it relates to the male population more often than not showed a convex pattern within their
data when examining age and gender together. In four of the leadership practices – Enable Others to Act, Model the Way, Challenge the Process and Inspire a Shared Vision – the male population would increase the mean of these transformational behaviors from age grouping 30-39 to age grouping 40-49, but then it would decrease when males reached the ages of 50-59. Although it decreased at the age of 50-59 it remained the lowest at age range 30-39 for the practices of Enable Others to Act, Model the Way and Challenge the Process. The male population of 50-59 years of age had the lowest mean in Inspire a Shared Vision. In the practice of Encourage the Heart, males decreased as the age increased. For this practice, there was a slight difference in the mean between the age groups of 30-39 and 40-49, but there was a greater difference in the means between ages 40-49 and ages 50-59.

Additionally when comparing male and females transformational leadership behaviors in conjunction with age and gender it was recognizable that females and males in the age grouping of 50-59 had the greatest differences in means for each of the leadership practices. Females between the ages of 50-59 years of age had the highest mean except in the practice of Challenge the Process. While males of the ages 30-39 exhibited the lowest means for all transformational behaviors except in Encourage the Heart and Inspire a Shared Vision. Overall, the female population tended to exhibit a greater mean then the male population, but this difference was not significant. This was confirmed by results of a two-way ANOVA test (see Table 13). Thus, age in relation to gender does not appear to be a factor in how science department chairs perceive themselves as transformational leaders as measured by the LPI-Self instrumentation.
The fourth demographic factor was related to total number of years of experience as a science department chair. For this demographic, the researcher divided the science department chairs into seven categories: (1) 1-3 years, (2) 4-6 years, (3) 7-9 years, and (4) 10 plus years. In examination of years of experience in the science department chair role all four experience ranges rated themselves as being transformational leaders. When examining specific ranges of experience in conjunction with specific leadership practices various trends emerged from the data.

As the means for years of experience and specific leadership practices are studied more closely findings indicated that, overall, science department chairs with seven to nine years of experience had the highest mean for transformational behaviors except in Challenge the Process. An obvious trend in the data is the practice of Enable Others to Act improves with experience, and Challenge the Process has the least amount of change in the mean value after a science department chair has three years of experience. Model the Way is a transformational behavior with the highest mean for science department chairs with 4-9 years of experience. A decreasing trend in the data for the leadership practices of Encourage the Heart, Inspire a Shared Vision, Challenge the Process, and Model the Way for science department chairs with 10 or more years of experience. While all experience groups viewed themselves as transformational leaders, the science department chairs with 7-9 years of experience produced the highest means within the leadership practices of Encourage the Heart, Inspire a Shared Vision, and Model the Way.
Among years of experience of department chairs who participated in this study, significant differences across both genders were revealed in the following regard: (1) years of experience and the practice of Enable Others to Act; and (2) years of experience and the practice of Model the Way. The other three leadership practices – Challenge the Process, Encourage the Heart, and Inspire a Shared Vision – did not show significant relationships between leadership behaviors and years of experience for a science department chair as measured by the LPI-Self survey. It can also be concluded based on a multiple comparisons testing that for the leadership practice of Enable Others to Act there is a significant difference in how science department chairs across genders with 1-3 years of experience versus 7-9 years of experience employ the commitments associated with this transformational leadership practice.

The fourth question attempted to decipher the relationship between the science department chairs’ self-perceptions of their transformational leadership practices and the principals’ observed perceptions of the science department chairs transformational leadership practices. The science department chairs self-perceptions of their transformational leadership behaviors produced higher means than the observed perceptions reported by the participating principals. In order to answer this question, data from principals and science department chairs coming from corresponding high schools was isolated and studied for trends. There were thirteen pairs of principals and science department chairs in the population sample.

Principal observed perceptions and science department chair self-perceived perceptions for each leadership behavior indicated there was a significant correlation
between the perceptions of principals and science department chairs for the transformational behavior of Encourage the Heart. The commitments for this practice reflect collegiality, trust, celebrating victories, and ownership of the decision making process. These attributes are important in fostering teacher leadership in departments. Although the paired samples correlation produced a piece of significant data, the paired sample two-tailed test did not provide results that allows the researcher to claim that there is a statistical difference between the principals’ observed perceptions of transformational leadership practices of the science department chairs and the self-perceptions of the science department chairs’ transformational leadership behaviors.

Conclusions

The first question of this study sought to understand the self-perceived transformational leadership behaviors in which science department chairs engage. Participants in this study functioning as science department chairs in public secondary schools replied that they view themselves as transformational leaders, and engage in all five leadership practices associated with being a transformational leader. However, the transformational behavior in which they engage the most as group is Enable Others to Act (see Table 6) while Challenge the Process and Inspire a Shared Vision surfaced continuously as the leadership behavior in which science department chairs engaged the least regardless of age or experience. Since the study did not inquire about historical background – educational training, professional development, career experience, mentoring, and role responsibilities – the researcher does not know if the sketch that emerged, signifying the science department chairs in this study as transformational
leaders is a result of career experiences, or individual instinctive nature on the part of the science department chair.

The second research question of this study sought to understand the transformational leadership behaviors in which science department chairs engaged as perceived by the building principals. Participants in this study serving as principals in public secondary schools replied that they view science department chairs as transformational leaders, and they believe science department chairs engage in all five leadership practices associated with being a transformational leader. However, the principals who participated in this study perceived the transformational behaviors of the science department chairs to a lesser degree than the science department chairs viewed themselves as transformational leaders. Identical to the self-perceptions of the science department chairs, the principals perceived the science department chairs lowest transformational behaviors as being Inspire a Shared Vision and Challenge the Process. The study did not inquire about the demographics or career experiences of the principal, thus the researcher does not know if the principals’ background was a factor in the perceptions that emerged of the science department chair as a transformational leader.

Additionally, the science department chairs were asked to comment on questions that pertained to only transformational leadership behaviors. Furthermore, findings cannot be generalized since a limitation of the study was that science department chairs were asked to self-assess their performance.

Based on the results of this study, it appears that leadership development would be beneficial for those preparing to take on a formalized teacher leadership role similar to
those of science department chair. The program should be designed to prepare these teacher leaders to serve as leaders in their schools rather than emphasis of completion of managerial components. The tasks that require transactional leadership can be learned through practice, whereas strong leadership is the underpinning key in ensuring vision, vitality, and growth of schools.

In Chapter II, the importance of training principals to be transformational leaders is supported by research. According to Hallinger (2003), his study suggests, “strong transformational leadership by the principal is essential in supporting commitment of teachers. Because teachers themselves can be barriers to the development of teacher leadership, transformational principals are needed to invite teachers to share leadership functions.”

A training or developmental leadership program is necessary for formalized teacher leaders because for organizations to be ensured success it is necessary to build strong organizations with leaders at many levels (Mintzberg, 2003). Research has shown that shared leadership amongst teachers “does not occur easily, and many studies suggest considerable reluctance among teachers to participate in leading” (Bishop & Mulford, 1996; Sheppard & Brown, 1996 as cited in Hallinger, 2003, p. 341). According to Reeves (2008), teacher leadership is not about positional authority but about the ability to influence the professional practice of other teachers. Leaders influencing others can occur through an inspired vision and by taking risks. Cuban (1988) states, “Leadership, then refers to people who bend the motivations and actions of others to achieving certain goals; it implies taking initiatives and risks” (p. 193). Taking initiatives and risks are key
components the transformational leadership practices of Challenge the Process and Inspire a Vision. If science department chairs, the middle managers, do not possess these capabilities or are not taught how to effectively enlist others in a common vision than the organization will have a hole in the leadership structure.

The typical program for training teachers to be science department chairs is broad in many areas of schools leadership. The central element of much worth is for schools to develop leaders at all levels to be experts in leadership. They need to develop and sustain transformational leadership skills as a foundation for all leaders if they desire to be effective and strong institutions. Elmore (2000) noted that dramatic changes in the way public schools define and practice leadership are needed in order to enable them to respond to the increasing demands they face under standards-based reform. Additionally, Elmore believes if leadership is to be distributed across the school community, wide-ranging view of leadership, rather than a narrow perspective on ideology, the fostering of teacher leadership is essential. The leadership development of those preparing to be department chairs in secondary public schools should be a part of a developmental continuum and career sequence for teacher leaders in schools.

Although statistical data was lacking for differences in transformational leadership practices when examined by gender, gender differences indicated trends between women and men when examining transformational leadership style using the LPI subscale. Based on the means values for each leadership practice ascertained from participants in this study, both genders exhibit transformational qualities but females exhibit it to higher degree in all five leadership practices than males. Eagley et al. (2003)
stated a similar claim when their research allowed them to claim that leadership style of men and women tend to differ even when they occupy the same leadership role because it is known that male and female leadership style are framed in the social role theory approach to leadership. Since male and females have different social identities, women and men tend to differ in their personal behavioral expectations specifically in their organizational surroundings (Ely, 1995).

The results obtained in this study provide a research foundation for the characteristics associated with leadership behaviors of science department chairs based on a variety of demographic factors and cross-comparison of perceptions of the imposed behaviors using the principals who oversee the science department chairs. Although these results do not produce a plethora of data that was statistically significant, they did produce trends relevant to specific demographics and leadership practices.

**Recommendations for Further Research**

This study was developed due to the researcher’s desire to understand more about leadership styles of formal teacher leaders, specifically department chairs. Furthermore, the researcher wanted to learn if the principals, primary evaluators of the department chair, observed perceptions of the leadership behaviors of the department chairs matched the self-perceptions of transformational leadership behaviors of the department chairs. Lastly, the researcher wanted to learn if connections existed between demographic factors regarding department chairs and transformational leadership practices.

The data collected from this study did show that science department chairs’ leadership style is transformational whether self-perceived by the department chairs or
observed by the principals. However, the principal viewed the science department chairs’ transformational leadership behaviors to a lesser degree than the department chairs ranked themselves. Regardless of whose perceptions were being analyzed – principals or science department chairs – the research also indicated that out of the five transformational leadership practices science department chairs scored lowest in behaviors that involve Challenge the Process and Inspire a Shared Vision within the organization. The research demonstrated that in the demographic category of gender there was a difference in the scores of women and men, with women having higher means for the leadership practices although nothing was statistically significant. In the demographic category of age and gender, the research revealed that science department chairs who were females between the ages of 50-59 viewed themselves as having the highest degree of transformational practices. For the male population, the age range of 40-49 perceived themselves as being more transformational in practice than the other two age groupings for the male population. Lastly, the research demonstrated that in the category of experience, science department chairs with seven to nine years experience professed themselves to be the most transformational leaders. When experience was examined with gender, females with seven to nine years of experience alleged that most often they exhibited themselves to be more transformational leaders than other subgroups in the study. A limitation in this study rests in the fact that all science department chairs self-evaluated their leadership practices, and another limitation is that not all of the principals who participated in the study paired with a science department chair who participated in the study.
The research attempted to extract information on the leadership behaviors of individuals who serve in role of formal teacher leader positions in secondary public schools, whether it be gender, age, years of experience, highest degree attained, department size, or professional experiences. Through the extraction of data, the researcher hoped to gain insight into what influences transformational leadership behaviors of science department chairs. Moreover, the researcher hoped to see if certain transformational behaviors dominated the work of science department chair, and if so what influenced those behaviors to be a dominate leadership trait over other behaviors.

In order to grasp a better understanding of the transformational leadership style of the department chairs, or even the leadership styles, the researcher makes the following recommendations for further study:

**Recommendation #1**: Administer the LPI-Self survey to the principals who supervise the department chairs and have the principals complete a demographic survey to determine to what extent the principals exhibit transformational behaviors themselves.

According to research, principals are essential in developing teacher leaders within a school (Hallinger, 2003). With that said, principals have the ability to influence the leadership style of department chairs, and thus play a central role in development of transformational formal teacher leaders. Examining the leadership style of the principal as well as demographical information would provide a broader picture for comparison of the department chair’s transformational practices and the principals’ transformational style. The educational field could benefit from learning if there is a connection between the transformational leadership practices of a building principal and a formal teacher
leader within the building. Better participation from same school participants – principals and department chairs – who work at the same public secondary school would further support reliability and the ability to generalize. To further validate the data, consider determining the transformational leadership practices of all administrators within the secondary school and/or district through the administration of the LPI-self instrument.

Recommendation #2: Expand the study to include department chairs from other content areas in public secondary schools in order to determine if there is a common leadership style amongst department chairs but also to determine if transformational practices are consistent within specific content areas, a school building, and/or district. Administer the LPI-Self survey and a demographic study to determine the profile of the different content area department leaders, or to determine the profile of leadership within a school building or district.

Departments vary in size, configuration, status, resource power, and staff expertise, which makes the role of the department chairs different from that experienced by their colleagues who oversee other departments. The subcultures associated with departments affect potential leadership performance differently; therefore, it would be beneficial to explore the leadership style of department chairs, but each must be examined by subject area. This recommendation is asking the field to examine how the position of department chairs is defined in secondary schools but also to determine the variation and similarities of this definition in terms of leadership styles of department chairs within specific disciplines. This is important to the field of education because
departments in secondary schools are separate worlds with their own ethnocentric way of examining issues (Siskin, 1994).

It would be advantageous to the field if we could determine the primary strengths and weaknesses of department chairs transformational leadership style in order to understand formal teacher leadership to a greater extent. What transformational behaviors do department chairs exhibit frequently, and what transformational behaviors are department chairs not employing in their role? Does the frequency at which transformational leadership practices are imposed vary based on content areas? Does the frequency at which transformational leadership practices are imposed vary based on school building or school district? If we believe that formal teacher leaders are essential to the growth of an organization and student achievement, it is plausible that we could benefit from examining the transformational leadership behaviors of all formal teacher leaders who hold department chair positions in secondary public schools.

Recommendation #3: Examine the role and responsibilities of department chairs to a greater extent such that other types of leadership styles are studied to determine to what extent does the role and responsibilities of the department chair allow for the chair to impose transformational practices versus transactional practices. Administer the Multifactor Leadership Questionnaire to determine if department chairs are more transactional or transformational in nature.

In examining practices associated with both leadership styles it would be useful to understand the specific activities, tasks, committees, or expectations a department chair engages in on a daily basis. The role of the department chair varies greatly between
schools, thus a more in depth qualitative study could provide a deeper understanding into the leadership styles of a department chair which would be valuable to the field of education. According to Siskin (1991) departments influence teachers and teaching in secondary schools. Not only do the (content-based) departments influence teachers, but the formal teacher leader, the department chair, influences the teachers. Wright (2001) stated, “middle managers are the most immediate link between national and school administration requirements and policies, and the core business of schools – teaching and learning” (p. 8).

Since department chairs are viewed as the connection between the administration and the teachers, it would be useful to determine throughout the course of the year, how much of a department chair’s time is spent performing common managerial tasks or promoting growth in such a fashion that informal teacher leaders are being developed? Studying the two leadership styles might provide some insight into why both department chairs and principals rated science department chairs lowest in the area of Challenge the Process and Inspire a Shared Vision.

Recommendation #4: Conduct a qualitative study to examine the training associated with becoming a department chair in order to determine how department chairs prepare for the role, why they enter into the role, what type of mentoring or guidance was associated as they transitioned into the role of department chair, how they are evaluated in the role, and what type of professional growth has been provided to them in the role of department chair.
Teacher leadership is a valuable aspect in education but in order to understand the role of a formal teacher leader it would be helpful to understand what influences specific department chairs leadership styles. A qualitative study might allow differences among school cultures to become pervasive in the behaviors imposed by department chairs. In order to foster teacher leadership, it needs to be a structural and consistent part of a school’s vision and practice. The concept of teacher leadership and transformational practices should be modeled for teachers throughout the schools. Visions and taking risks emerges from values associated with a school, and it should provide motivation and enthusiasm for all members of the organization (Johnstone, 1987). A qualitative study may be able to determine what schools model effective transformational leadership practices and how are certain individuals, department chairs, benefiting from these practices.

Recommendation #5: Study individual transformational leadership practices and examine the commitments associated with the practice in depth to determine the predominate roles and/or responsibilities a department chair engages in on a daily basis to see if those responsibilities link to the commitments that the department chair proclaims to possess.

The field could benefit from learning more specifics about the leadership styles of department chairs in schools rather than overarching generalizations about practices. Learning how science department chairs rate themselves in all commitments associated with each leadership practice would provide more detailed information into how department chairs perceive themselves in terms of each variable that composes the
practice. A more in depth examination into the specific leadership practices would
further support reliability and ability to generalize.

**Recommendation #6**: Select a group of department chairs, and examine the
commitments associated with Challenge the Process and Inspired a Shared Vision in
conjunction with the roles and responsibilities of a department chair as well as individual
intrinsic nature of the department chair to determine why department chairs exhibit these
transformational behaviors to a lesser degree than the others.

The results of this study did not find numerous statistical differences but the
practices of Challenge the Process and Inspire a Shared Vision continued to be the
leadership practices that were rated lower than the other when examining means relevant
to demographic data and principals’ observed perceptions. Since establishing a vision is
a key component to fostering leadership capacity, it would be beneficial to the field to
understand why department chairs tend to exhibit these two practices to a lesser degree
than the others. What makes them fall lower on the list than the other practices? Does it
connect to all commitments or specific commitments associated with these practices?
Beare, Caldwell, and Millikan (1989) stated, “….outstanding leaders have a vision of
their schools – a mental picture of a preferred future – which is shared with all in the
school community” (p. 99). The vision needs to be the place from which all activities in
an organization should start (Lambert, 1988). Thus, without being able to develop and
inspire a vision, and take risks to motivate teachers department chairs might face
challenges as they work to build leadership capacity in their departments.
Final Reflection

The science department chairs that participated in this study were all transformational leaders to a certain degree. As a group they viewed themselves as exhibiting leadership behaviors associated with Enable Others to Act, Encourage the Heart, and Model the Way to a higher degree than Inspire a Shared Vision and Challenge the Process. At large the principal’s in this study viewed science department chairs as being transformational leaders, however, it was to a lesser degree than the shared self-perceptions ascertained from the science department chairs.

A look at demographic information from the science department chairs revealed more trends than statistical differences. Based on mean values, female science department chairs viewed themselves as being more transformational than the males. Additionally, age produced varying information for both genders and across genders but none of the data proved to be statistically significant. Years of experience across both genders showed significant differences in the practices of Model the Way and Enable Others to Act.

The principals’ observed perceptions of the science department chairs’ transformational behaviors were compared to the science department chairs’ self-perceptions of these behaviors to determine if relationships existed amongst their responses. Only one significant difference appeared from the paired correlations. A relationship between the principals’ observed perceptions and the science department chairs’ self-perceptions existed for the transformational behavior of Encourage the Heart.
However, when paired t-test was performed the data provided by the correlated principals and science department chairs did not produce any statistical differences.

The literature indicates that leadership is not something that should be done in isolation. Leadership behaviors when both modeled and taught can be learned. Leaders influence others and/or improve the leadership behaviors of others which ultimately will produce leadership capacity in schools. The ability to develop leadership capacity within a school is a daunting task, unless the leadership becomes distributed throughout the organization. As Elmore (2000) suggested, “In a knowledge-intensive enterprise like teaching and learning there is no way to perform these complex tasks without widely distributing the responsibilities for leadership among roles in the organization” (p.14).

The literature indicates that unknown dilemmas, office politics, complexities of organizations, undefined roles, endless stress, lack of preparation, supervisor evaluations, and many other facets of a department chairs role all have a profound impact on department chairs. It is a challenging role where it becomes hard to be the transformational leader that is essential in schools. However, if leadership is going to be distributed to teachers in order to build teacher leadership in schools, the closest building level leader to the teachers are the department chairs. The department chairs’ quality of leadership will be the most influential motivator for the teachers in the department, and it will also influence the quality of teaching in the classroom (Fullan, 2001; Sergiovanni, 2001).
It is critical for the field of education to create programs that speak to the development of strong transformational formal teacher leaders in secondary schools, specifically science department chairs. Additionally, evaluations for department chairs should be developed that reflect all facets of the complexities associated with this role so that department chairs can receive specific feedback to develop and/or enhance their leadership behaviors. Lastly, the field needs principals who will foster leadership capacity, promote teacher leadership, and who inspire department chairs to excel as leaders. It becomes the commission of other transformational leaders to form transformational teacher leaders in the building and to inspire these teacher leaders to excel into more formalized leadership positions in schools. In other words, the leadership must be distributed such that everyone in the organization is leading to advance the cause.
APPENDIX A

LPI-SELF SURVEY
**Leader Directions:** To what extent do you typically engage in the following behaviors? Choose the response number that best applies to each statement and check the box to the right of the statement.

1 = Almost Never  
2 = Rarely  
3 = Seldom  
4 = Once in a While  
5 = Occasionally  
6 = Sometimes  
7 = Fairly Often  
8 = Usually  
9 = Very Frequently  
10 = Almost Always

1. I am a personal example of what I expect of others.
2. I talk about future trends that will influence how our work gets done.
3. I seek out challenging opportunities that test my own skills & abilities.
4. I develop cooperative relationships among the people I work with.
5. I praise people for a job well done.
6. I spend time and energy making certain that the people I work with adhere to principles and standards that we have agreed upon.
7. I describe a compelling image of what our future could be like.
8. I challenge people to try out new and innovative ways to do their work.
9. I actively listen to diverse points of view.
10. I make it a point to let people know about confidence in their abilities.
11. I follow through on the promises and commitments that I make.
12. I appeal to others to share an exciting dream of the future.
13. I search outside the formal boundaries of the organization for innovative ways to improve what we do.
14. I treat others with dignity and respect.
15. I make sure that people are creatively rewarded for their contributions to the success of our projects.
16. I ask for feedback on how actions affect other people's performance.
17. I show others how their long-term interests can be realized by enlisting in a common vision.
18. I ask "What can I learn?" when things don't go as expected.
19. I support the decisions that people make on their own.
20. I publicly recognize people who exemplify commitment to shared values.
21. I build consensus around a common set of values for running the organization.
22. I paint the "big picture" for what we aspire to accomplish.
23. I make certain that we set achievable goals, make concrete plans, and establish measurable milestones for projects and programs that we work on.
24. I give people a great deal of freedom and choice in how to do their work.
25. I find ways to celebrate accomplishments.
26. I am clear about the philosophy of leadership.
27. I speak with genuine conviction about higher meaning & purpose of our work.
28. I experiment and take risks, even when there is a chance of failure.
29. I ensure that people grow in their jobs by learning new skills and developing themselves.
30. I give the members of the team lots of appreciation and support for their contributions.

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APPENDIX B

LPI-OBSERVER SURVEY
Observer Directions: "How frequently do I engage in the behavior described?" To what extent do you observe the leader engaging in the following behaviors? For each statement, decide on a response (1-10) and then mark the corresponding number that best applies to each statement by checking the box to the right of the statement.

1 = Almost Never  
2 = Rarely 
3 = Seldom 
4 = Once in a While 
5 = Occasionally 
6 = Sometimes 
7 = Fairly Often 
8 = Usually 
9 = Very Frequently 
10 = Almost Always 

1. Sets a personal example of what he/she expects of others.
2. Talks about future trends that will influence how our work gets done.
3. Seeks out challenging opportunities that tests his/her own skills & abilities.
4. Develops cooperative relationships among the people he/she works with.
5. Praises people for a job well done.
6. Spends time and energy making certain that the people he/she works with adhere to principles and standards that we have agreed upon.
7. Describes a compelling image of what the future could be like.
8. Challenges people to try out new and innovative ways to do their work.
9. Actively listens to diverse points of view.
10. Makes it a point to let people know about confidence in abilities.
11. Follows through on the promises and commitments that are made.
12. Appeals to others by sharing an exciting dream of the future.
13. Searches outside the formal boundaries of the organization for innovative ways to improve what they do.
14. Treats others with dignity and respect.
15. Makes sure that people are creatively rewarded for their contributions to the success of projects.
16. Asks for feedback on how actions affect other people's performance.
17. Shows others how their long-term interests can be realized by enlisting in a common vision.
18. Asks "What can I learn?" when things don't go as expected.
19. Supports the decisions that people make on their own.
20. Publicly recognizes people who exemplify commitment to shared values.
21. Builds consensus around a common set of values for running the organization.
22. Paints the "big picture" for what he/she aspires to accomplish.
23. Makes certain that achievable goals are set, makes concrete plans, and establishes measurable milestones for projects and programs that are being worked on.
24. Gives people a great deal of freedom and choice in how to do their work.
25. Finds ways to celebrate accomplishments.
26. Clear about the philosophy of leadership.
27. Speaks with genuine conviction about higher meaning & purpose of work.
28. Experiments and takes risks, even when there is a chance of failure.
29. Ensures that people grow in their jobs by learning new skills and developing themselves.
30. Gives the members of the team lots of appreciation and support for contributions.

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31. I would appreciate if you could reveal the name of the school which employees you. In order to maintain confidentiality and safeguard the data, the researcher will download the data and re-code the data using numbers. Only data that has been de-identified will be used by the researcher.

Name of High School: ____________________________________________________________
APPENDIX C

DEMOGRAPHICS SURVEY
Demographics Survey for Department Chairs

Directions: Please check the response that best describes you or your experience.

1. What is your gender? □ male □ female

2. Do you hold a type 75 certificate? □ yes □ no

3. What type of contract are you under? □ Administrator’s contract □ Teacher’s contract

4. Currently, I am ______ years old.

5. What is the highest degree you have attained?
   □ Bachelors degree
   □ Master degree in Education or Teaching
   □ Masters degree in Administration
   □ Masters degree in Science
   □ Masters degree in Curriculum
   □ Masters degree in another content area
   □ Ph.D. in Science
   □ Ph.D. in Administration
   □ Ph.D. in Curriculum

6. Prior to becoming a science department chair, for how many years were you a full-time science teacher?
   □ 1 year to 3 years
   □ 4-6 years
   □ 7-9 years
   □ 10-12 years
   □ 13-15 years
   □ 16-19 years
   □ 20+ years
7. How many total years have you served as a science department chair?

- □ 1 year to 3 years
- □ 4-6 years
- □ 7-9 years
- □ 10-12 years
- □ 13-15 years
- □ 16-19 years
- □ 20+ years

8. How many years have you served as the science department chair at your current high school?

- □ 1 year to 3 years
- □ 4-6 years
- □ 7-9 years
- □ 10-12 years
- □ 13-15 years
- □ 16-19 years
- □ 20+ years

9. What is current population size of teachers in your department?

- □ 3-5 science teachers
- □ 5-8 science teachers
- □ 9-12 science teachers
- □ 13-15 science teachers
- □ 16-19 science teachers
- □ 20-23 science teachers
- □ 24-27 science teachers
- □ 28-31 science teachers
- □ 32-34 science teachers
- □ 35+ science teachers

10. As department chair, how many classes are you responsible for teaching?

- □ 0 classes
- □ 1 class
- □ 2 classes
- □ 3 classes
- □ 4 classes
11. As department chair, do you have supervisory/evaluation responsibilities for your teachers?

   □ No
   □ Yes, I am the sole evaluator of the teachers in my department
   □ Yes, but the administration also evaluates teachers in my department

12. As department chair, I am responsible for the following: (check all that apply)

   □ Holding department meetings
   □ Observing teachers in the department
   □ Evaluating teachers in the department
   □ Supporting the learning needs of the teachers in the department
   □ Managing clerical duties such as textbook inventories, budget reports, departmental supplies
   □ Locating content specific resources for the department
   □ Keeping up-to-date in the area of content and curricular changes
   □ Carrying out administrative duties associated with the department
   □ Attending school and district meetings as the department representative
   □ Offering moral support and positive encouragement to department members
   □ Responsible for hiring new teaching staff
   □ Responsible for the development of new courses

13. I would appreciate if you could reveal the name of the school which employees you. In order to maintain confidentiality and safeguard the data, the researcher will download the data and re-code the data using numbers. Only data that has been de-identified will be used by the researcher.

   Name of High School: ________________________________
APPENDIX D

LETTER OF AGREEMENT FROM KOUZES AND POSNER
KOUZES POSNER INTERNATIONAL
1548 Camino Monde
San Jose, California 95125
FAX: (408) 554-4553

June 26, 2009

Kathryn Baal
811 South Lytle #208
Chicago, IL 60607

Thank you for your request to use the Leadership Practices Inventory (LPI) in your dissertation. We are willing to allow you to reproduce the instrument in written form, as outlined in your request, at no charge. If you prefer to use our electronic distribution of the LPI (vs. making copies of the print materials) you will need to separately contact Lisa Shannon (lshannon@wiley.com) directly for instructions and payment. Permission to use either the written or electronic versions requires the following agreement:

(1) That the LPI is used only for research purposes and is not sold or used in conjunction with any compensated management development activities;
(2) That copyright of the LPI, or any derivation of the instrument, is retained by Kouzes Posner International, and that the following copyright statement is included on all copies of the instrument; "Copyright © 2003 James M. Kouzes and Barry Z. Posner. All rights reserved. Used with permission”,
(3) That one (1) electronic copy of your dissertation and one (1) copy of all papers, reports, articles, and the like which make use of the LPI data be sent promptly to our attention; and,
(4) That you agree to allow us to include an abstract of your study and any other published papers utilizing the LPI on our various websites.

If the terms outlined above are acceptable, would you indicate so by signing one (1) copy of this letter and returning it to us. Best wishes for every success with your research project.

Cordially,

Ellen Peterson
Permissions Editor
epeterson@scu.edu

I understand and agree to abide by these conditions:

(Signed) Date:

Expected Date of Completion is: ____________________________
APPENDIX E

ELECTRONIC CORRESPONDENCE WITH WILEY AND SONS
Hello Katie,

We have a web-based version of the LPI available (www.lpionline.com). With this email I’m connecting you with one of our LPI consultants, Ron Aragon. He can answer all your questions about how LPI Online works. We give a substantial discount on the product to students like yourself (just $10 per leader, with observers at no cost). If for some reason, LPI Online will not work for your study, you will need to seek permission a pay a set fee to use the instrument in your universities electronic survey distribution system. The person to contact about that is Debbie Notkin and I have also cc’ed her on this email.

Best,

Lisa

From: Katie Baal [mailto:amba@cs99.org]
Sent: Monday, June 29, 2009 8:32 PM
To: Shannon, Lisa - San Francisco
Cc: kbaal@yahoo.com
Subject: Electronic Distribution of LPI

Ms. Shannon,

My name is Kathryn Baal and I will be using the LPI survey in my dissertation through Loyola University of Chicago. Today in the mail I received a letter from Ms. Peterson granting me permission to reproduce the instrument for my research. The letter informed me to contact you about instructions and payment for using the electronic version. I am planning on sending out the survey electronically, if I am allowed to proceed in this fashion. Loyola University uses opinio as their electronic survey distribution.

I will be using both the self-LPI and the observer-LPI to conduct my research plus a short demographic survey. My research is asking department chairs to share their self-perception of their leadership behaviors, and their principal to share their observations of the department chair’s leadership behavior. Only the department chairs will be completing the short demographics survey. Besides the instructions and fees, I am hoping that you can share with me if there is a method by which the results from specific chair (self-LPI) are coded/linked to their specific principal (observer-LPI).

I would appreciate any information you can share with me. I can be reached via email or by phone 312.593.8160. My address is 811 South Lytle #208, Chicago, IL 60606.

Thank you,

Kathryn

https://webmail.cs99.org/OWA/?ae=Item&a=Preview&t=IPM.Note&id=RgAAAAAIAAA... 7/1/2009
4. Lastly, I am assuming the $100 is on top of the $10/LPI-self fee, is this accurate?

[DN] You would have to buy a single copy of the LPI Self for $10, but you would not have to pay $10 for each person taking the self inventory.

Next Thursday, July 9th I am meeting with my advisor, and I will share with her the options of doing it via Opinion at Loyola or through the online system established at your company. Once we make our decision I will be back in touch with you.

Thank you, and have a wonderful holiday weekend.

Katie

From: Notkin, Debbie - San Francisco [dnotkin@wiley.com]
Sent: Wednesday, July 01, 2009 5:00 PM
To: Katie Baal
Subject: RE: LPI Survey for Dissertation

Hi, Katie,

The Loyola software should be fine with us. Our fee for putting the LPI information into another format (such as Survey Monkey, Zoomerang, or this software) is $100. Checks can be made payable to John Wiley & Sons, Inc. and sent to my attention at 989 Market Street, 5th Floor, San Francisco, CA 94103.

The $100 pays for your right to incorporate all of the questions from the LPI-Self into a survey program, collect the data, and use that data in your research. You agree to send us a copy of your finished research, and not to use the LPI material in any other fashion without express permission from us. You must use the most current (3rd) edition of the LPI self, and you must include the copyright notice for that edition.

Please let me know if you have further questions or concerns.

Debbie

Debbie Notkin
Contracts Manager
(415) 782-3182/fax 415 433-4611
dnotkin@wiley.com

⚠️ please don't print this e-mail unless you really need to

From: Katie Baal [mailto:kbaal@cs99.org]
Sent: Wednesday, July 01, 2009 1:54 PM

https://webmail.cs99.org/OWA/?ae=Item&t=IPM.Note&id=RgAAAAAHAAsePSquQY...  7/17/2009
APPENDIX F

CONTACT LETTER – SCIENCE DEPARTMENT CHAIRS
May, 2010

Dear Colleague,

My name is Kathryn Baal, and I am a doctoral candidate in Educational Leadership and Policy Study program at Loyola University of Chicago. I am formally requesting permission for you to participate in my dissertation research. The purpose of the study is to examine transformational leadership practices of science department chairs as perceived by both the science department chair and their principals as well as to study how background variables such as gender, experience, educational level, and age relate to leadership practices of science department chairs. My dissertation is titled *Leadership Practices of Science Department Chairs in Secondary Public Schools*.

You will be asked to complete an electronic survey consisting of thirty questions based on your leadership practices followed by twelve demographic questions focusing on gender, years of experience both in the classroom and as a chair, earned degrees, age, and certification. If you decide to participate, your time commitment is estimated to be fifteen to twenty minutes. You will have two weeks to complete the survey. In this research study, neither individual schools nor names of participants will be identified in any reports. *Though you will be asked to provide the name of your individual school on the survey, this information will only be used to match your responses to those of your principal. Once the matching occurs, school names will be replaced by numerical codes and the school names be kept confidential.* I will store the school names and codes in a locked cabinet, separately from the survey data. Your participation is completely voluntary. There is no penalty for non-participation, and you are able to choose to rescind your participation at any time.

If you choose to participate, please follow the hyperlink below to the electronic survey. By completing the electronic survey, you are agreeing to serve as a participant in this research. Confidentiality will be maintained to the degree permitted by the technology used, however, no absolute guarantees can be made regarding the confidentiality of electronic data. By completing an anonymous survey and then submitting it to the researcher, the researcher will be unable to extract anonymous data from the database should the participant wish it withdrawn.

Thank you for your consideration of my request. Your input is genuinely valuable to this study, and it could provide helpful feedback for current and future leaders in formalized teacher leadership positions in secondary schools. If you have any questions, please feel free to contact me at the phone numbers below or via e-mail. You may also contact my dissertation chairperson, Dr. Therese Pigott at 312.915.6245 or tpigott@luc.edu. Any questions you may have about your rights as a research participant can be directed to the Compliance Manager in Loyola’s Office of Research Services at 773.508.2689.

Sincerely,

Kathryn Baal
Doctoral Candidate

Loyola University Chicago · School of Education · 820 N. Michigan Ave., Lewis Towers 11th Floor, Chicago, IL 60611 · 312.915.6800 · SchlEduc@luc.edu
APPENDIX G

CONTACT LETTER – PRINCIPALS
May, 2010

Dear Principal,

My name is Kathryn Baal, and I am a doctoral candidate in Educational Leadership and Policy Study program at Loyola University of Chicago. I am formally requesting permission for you to participate in my dissertation research. The purpose of the study is to examine leadership practices of science department chairs as perceived by both the science department chair and their principals as well as to study how background variables such as gender, experience, educational level, and age relate to leadership practices of science department chairs. My dissertation is titled *Leadership Practices of Science Department Chairs in Secondary Public Schools*.

You will be asked to complete an electronic survey titled the *Leadership Practice Inventory – Observer* that is estimated to take ten to fifteen minutes to complete. The survey consists of thirty questions asking you to measure to what extent you observe certain behaviors in the science department chair in your school. You will have two weeks to complete the survey. Your responses and the responses of your science department chair will remain confidential. In this research study, neither individual schools nor names of participants will be identified in any reports. **Though you will be asked to provide the name of your individual school on the survey, this information will only be used to match your responses to those of your science department chair. Once the matching occurs, school names will be replaced by numerical codes, and the school names will be kept confidential.** I will store the high school names and codes in a locked cabinet, separately from the survey data. Your participation is completely voluntary. There is no penalty for non-participation, and you are able to choose to rescind your participation at any time.

If you choose to participate, please follow the hyperlink below to the electronic survey. By completing the electronic survey, you are agreeing to serve as a participant in this research. Confidentiality will be maintained to the degree permitted by the technology used, however, no absolute guarantees can be made regarding the confidentiality of electronic data. By completing an anonymous survey and then submitting it to the researcher, the researcher will be unable to extract anonymous data from the database should the participant wish it withdrawn.

Thank you for your consideration of my request. Your input is valuable to this study, and potentially it could provide helpful feedback for current and future leaders in formalized teacher leadership positions in secondary schools. If you have any questions, please feel free to contact me at the phone numbers below or via e-mail. You may also contact my Dissertation Chair, Dr. Therese Pigott at 312.915.6245 or tpigott@luc.edu, or the Compliance Manager in Loyola’s Office of Research Services at 773.508.6289.

Sincerely,
Kathryn M. Baal
Doctoral Candidate

Loyola University Chicago· School of Education · 820 N. Michigan Ave., Lewis Towers 11th Floor, Chicago, IL 60611 · 312.915.6800 · SchlEduc@luc.edu
APPENDIX H

REMINDER EMAIL LETTER FOR SCIENCE DEPARTMENT CHAIRS
Kathryn M. Baal

May, 2010

Dear Colleague,

Recently, I sent you a formal electronic letter requesting permission for you to voluntarily participate in my dissertation research. As a doctoral candidate in Educational Leadership and Policy Study program at Loyola University of Chicago, I am asking you to participate in my study on "Leadership Practices of Science Department Chairs in Secondary Public Schools." If you have already completed the electronic survey, I thank you. If you have not done so, I would like to offer this letter as a reminder and stress the importance of your participation in this study, as well as the participation of your principal.

In this research study, neither individual schools nor names of participants will be identified in any reports. Participants’ identities and school names will not be disclosed within the research. Though you will be asked to provide the name of your individual school on the survey, this information will only be used to match your responses to those of your science department chair. Once the matching occurs, school names will be replaced by numerical codes, and the school names will be kept confidential. I will store the high school names and codes in a locked cabinet, separately from the survey data. Your participation is completely voluntary. There is no penalty for non-participation, and you are able to choose to rescind your participation at any time.

If you choose to participate, please complete the online Leadership Practices Inventory-Self survey and the demographics survey by accessing the hyperlink below. The electronic survey will take approximately fifteen to twenty minutes to complete. By completing the electronic survey, you are agreeing to serve as a participant in this research. Confidentiality will be maintained to the degree permitted by the technology used, however, no absolute guarantees can be made regarding the confidentiality of electronic data. By completing an anonymous survey and then submitting it to the researcher, the researcher will be unable to extract anonymous data from the database should the participant wish it withdrawn.

If you have any questions, please feel free to contact me at the phone numbers below or via email. You may also contact my Dissertation Chair, Dr. Therese Pigott at 312.915.6245 or tpigott@luc.edu, or the Compliance Manager in Loyola’s Office of Research Services at 773.508.6289. Your assistance is appreciated greatly, and your input is valuable to this study. If you are interested in a summary of the results of this research, please feel free to send me an email and I will be glad to share it with you upon completion.

Sincerely,
Kathryn M. Baal
Doctoral Candidate

Loyola University Chicago· School of Education · 820 N. Michigan Ave., Lewis Towers 11th Floor, Chicago, IL 60611· 312.915.6800 · SchlEduc@luc.edu
APPENDIX I

REMINDER EMAIL LETTER FOR PRINCIPALS
Kathryn M. Baal

May, 2010

Dear Principal,

Recently, I sent you a formal electronic letter requesting permission for you to voluntarily participate in my dissertation research. As a doctoral candidate in Educational Leadership and Policy Study program at Loyola University of Chicago, I am asking you to participate in my study on Leadership Practices of Science Department Chairs in Secondary Public Schools. If you have already completed the electronic survey, I thank you. If you have not done so, I would like to offer this letter as a reminder and stress the importance of your participation in this study, as well as the participation of the science department chair in your building.

In this research study, neither individual schools nor names of participants will be identified in any reports. Participants’ identities and school names will not be disclosed within the research. Though you will be asked to provide the name of your individual school on the survey, this information will only be used to match your responses to those of your science department chair. Once the matching occurs, school names will be replaced by numerical codes, and the school names will be kept confidential. I will store the high school names and codes in a locked cabinet, separately from the survey data. Your participation is completely voluntary. There is no penalty for non-participation, and you are able to choose to rescind your participation at any time.

If you choose to participate, please complete the online Leadership Practices Inventory-Observer survey by accessing the hyperlink below. The electronic survey will take approximately ten to fifteen minutes to complete. By completing the electronic survey, you are agreeing to serve as a participant in this research. Confidentiality will be maintained to the degree permitted by the technology used, however, no absolute guarantees can be made regarding the confidentiality of electronic data. By completing an anonymous survey and then submitting it to the researcher, the researcher will be unable to extract anonymous data from the database should the participant wish it withdrawn.

If you have any questions, please feel free to contact me at the phone numbers below or via e-mail. You may also contact my Dissertation Chair, Dr. Therese Pigott at 312.915.6245 or tpigott@luc.edu, or the Compliance Manager in Loyola’s Office of Research Services at 773.508.6289. Your assistance is appreciated greatly, and your input is valuable to this study. If you are interested in a summary of the results of this research, please feel free to send me an email and I will be glad to share it with you upon completion.

Sincerely,
Kathryn M. Baal
Doctoral Candidate

Loyola University Chicago· School of Education· 820 N. Michigan Ave., Lewis Towers 11th Floor, Chicago, IL 60611· 312.915.6800· SchlEduc@luc.edu
APPENDIX J

CONSENT TO PARTICIPATE IN RESEARCH
May, 2010

Re: Consent to Participate in Research

You are being asked to participate in a research study being conducted by Ms. Kathryn Baal for a dissertation under the supervision of Dr. Therese Pigott in the Department of Education at Loyola University of Chicago. My dissertation is titled *Leadership Practices of Science Department Chairs in Secondary Public Schools*. You are being asked to participate in this study because you serve as either a science department chair or a principal in one of one hundred and twenty-six secondary suburban public schools. The first group being asked to participate in the study represents one hundred and twenty-six science department chairs of secondary suburban public schools. The second group is one hundred and twenty-six building principals from the schools where the science department chairs are employed. All high schools considered for this study are public and are located in the suburbs between Interstate 80 and the Illinois-Wisconsin border. The high schools vary in terms of suburban location, income, race, ethnicity, state test scores, attendance, truancy graduation rates, and mobility. Please read this form carefully, and feel free to ask any questions you may have before deciding whether to participate in the study.

The purpose of this study is to examine leadership practices of science department chairs as perceived by both the science department chair and their principals as well as to study how background variables such as gender, experience, educational level, and age relate to leadership practices of science department chairs. If you agree to be in the study, both science department chairs and principals will be asked to complete an electronic survey specific to their position in the school. Each group of participants will follow a given hyperlink to the specific electronic survey. By completing the electronic survey, you are agreeing to serve as a participant in this research.

Science department chairs will be required to complete an electronic survey consisting of two components. The survey should take approximately fifteen to twenty minutes to complete.

- The first part of the survey the science department chairs will complete is the *Leadership Practice Inventory – Self version (LPI-self)*. This portion of the survey consists of thirty multiple-choice questions which will allow each chair to evaluate his or her leadership practices.
The second part of the electronic survey for the science department chairs addresses demographic questions. These responses will allow the researcher to ascertain demographic data relevant to gender, age, educational level, and work experience.

Principals will be required to complete the electronic version of the *Leadership Practice Inventory – Observer version (LPI-observer)*. This survey consists of thirty multiple-choice questions which will allow each principal to evaluate the observed leadership practices of the science department chair in their building. The electronic survey will take approximately ten to fifteen minutes to complete.

There are no foreseeable risks involved in participating in this research beyond those experienced in everyday life. There are no direct benefits to you from participation, but this study will allow the researcher to examine a limited area in education, the formalized role of teacher leaders, specifically science department chairs. Hopefully, this study will provide the field of education with further insight into the levels of transformational leadership practices among formal teacher leaders, science department chairs.

In this research study, neither individual schools nor names of participants will be identified in any reports. Though you will be asked to provide the name of your individual school on the survey, this information will only be used to match your responses to those of your principal. Once the matching occurs, school names will be replaced by numerical codes and the school names be kept confidential. School names and codes will be stored in a locked cabinet, separately from the survey data. In order to maintain confidentiality and safeguard the data, the researcher will download the data and re-code the data using numbers. Only data that has been de-identified will be used by the researcher. The original data set will be destroyed once it has been re-coded numerically, and the master list will be kept separate from the data in a locked file cabinet in the researcher’s home. All recoded data will be kept on the researcher’s personal home computer, and results will be reported in aggregate form. Only the researcher and her advisor will have access to the data. After five years, the researcher will destroy the data.

Confidentiality will be maintained to the degree permitted by the technology used, however, no absolute guarantees can be made regarding the confidentiality of electronic data. By completing an anonymous survey and then submitting it to the researcher, the researcher will be unable to extract anonymous data from the database should the participant wish it withdrawn.

Participation in this study is voluntary. If you do not want to be in this study, you do not have to participate. Even if you decide to participate, you are free not to answer any question or to withdraw from participation at any time without penalty. There is no
penalty for non-participation, and you are able to choose to rescind your participation at any time. By completing the survey you are agreeing to participate in the research.

If you have questions about this research study, please feel free to contact me, Kathryn Baal, at 630.795.8211 or kbaal@csd99.org or the faculty advisor, Dr. Therese Pigott at 312.915.6245 or tpigott@luc.edu. If you have questions about your rights as a research participant, you may contact the Loyola University Office of Research Services at 773.508.2689.

Sincerely,
Kathryn Baal, Doctoral Candidate
APPENDIX K

REQUEST FOR WAIVER OF DOCUMENTATION
Form A
Request for Waiver of Documentation of Informed Consent

Investigator's name: Kathryn M. Baal

Title of Project: Leadership Practices of Science Department Chairs in Secondary Public Schools

A. Waiver of Documentation of Consent
Documentation of consent means that participants are required to sign a consent form, thereby documenting their consent. A waiver of documentation means that the IRB is waiving the requirement to obtain the participant’s signature. Even if this waiver is granted, a consent process must still be in place. The consent process must contain all the required elements of consent and usually consists consent form or a verbal script that is read aloud to them.

For the IRB to grant this waiver, your project must meet one of the following conditions. Check the appropriate condition and explain why your research meets the condition in the space provided.

☐ Condition 1-The only record linking the participant and the research would be the consent document and the principal risk would be the potential harm resulting from a breach of confidentiality. Each subject will be asked whether the subject wants documentation linking the subject with the research, and the subject's wishes will govern. This refers to instances where participants could be seriously harmed if it became known that they were participants in the research.

Explaination:

OR

☒ Condition 2-The research presents no more than minimal risk of harm to participants and involves no procedures for which written consent is normally required outside of the research context. This refers to procedures such as mail surveys or brief interviews over the telephone or at public events/venues that elicit non-sensitive information.

Explaination: This research study will have participants share demographic information and behaviors they engage in as leaders; this is minimal risk of harm. Data will be collected through an online survey via Opinio software. By completing the electronic survey, individuals are acknowledging permission to voluntarily serve as a participant in the study.

Signature of Researcher: ___________________ Date: 01/10/10
APPENDIX L

DESCRIPTIVE STATISTICS FROM LPI-SELF STUDY
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VITA

Kathryn M. Baal is the daughter of Robert and Patricia Baal. She was born and raised on the Southside of Chicago with her two sisters, and she currently resides in city. She attended Christ the King Elementary School and St. Ignatius College Prep High School.

She graduated from St. Mary’s College of Notre Dame with a Bachelor of Science degree in Biology with concentrations in Chemistry and Mathematics in 1994. After completing her undergraduate degree, she immediately became a member of the first group of teachers trained and missioned by the Alliance for Catholic Education (ACE) at the University of Notre Dame. In 1996 upon completion of two years in the teacher service program at Notre Dame she received her Masters of Arts in Teaching from the University of Portland. A few years after returning to Chicago, in 2001 she entered the Educational Leadership and Policy Studies doctoral program at Loyola University of Chicago. She will graduate in August 2011 with her doctorate in Administration and Supervision.

Kathryn has worked in the field of education for 17 years. Her career in education began at Redemptorist High School in Baton Rouge, Louisiana where she taught Geometry, Biology, and Anatomy and Physiology. She continued teaching science through the years at St. Ignatius College Prep in Chicago, Maine South in Park Ridge, Illinois and Downers Grove North High School in Downers Grove, Illinois. At
Downers Grove North High School she served administratively as the science department chair for seven years. In the July of 2011, she will become the principal of Loyola Academy in Wilmette, Illinois.