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School context and individual characteristics: what influences principal practice?

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Abstract

Purpose – As they operate in complex schools principals must allocate their attention to numerous responsibilities. This paper seeks to ask three questions: how do principals allocate their attention across major realms of responsibility; to what extent do principals in different contexts emphasize different realms of responsibility; and to what extent do individual attributes affect how principals allocate their attention across realms?

Design/methodology/approach – A cluster analysis is applied to data from a daily log of principal practices to identify principals who allocate their attention across major realms of responsibility in similar ways. With the three groups identified in the cluster analysis a discriminant analysis is then used to examine the individual attributes of the principals and the contexts within which these groups work to identify those individual characteristics and contextual conditions that best predict each principal's cluster membership.

Findings – The data from the log indicate that principals are not as fragmented across numerous realms of responsibility as previous research suggests. Some principals do spend considerable time on instructional leadership. The cluster analysis revealed three groups: "Eclectic" Leaders (their activities are distributed more evenly across different activities); Instructional Leaders (they focused most on Instructional Leadership); and Student Leaders (they emphasized student affairs). In the paper's discriminant analyses no individual attributes distinguished amongst the three types of principals; only contextual conditions predicted membership.

Research limitations/implications – The results point to the influence that context plays on school principals' practice; principals appear to prioritize and focus their actions under more challenging contextual conditions. The next step in the analysis is to determine how the leadership clusters and principal practices relate to important school outcomes.

Originality/value – The paper provides useful information on influences on school principals' practice.

Keywords Education, Leadership, Principals, Schools, Individual behaviour

Paper type Research paper



Introduction

Schools are complex organizations; consequently, the contexts within which principals work present multiple, often competing, demands for principals' attention. There are obviously limits on principals' time and attention and therefore, a fundamental challenge that principals face is how to allocate their attention to multiple, competing

demands and responsibilities. Early research on understanding principals' work concluded that the work of the principal can be characterized by an array of short, fragmented activities often conducted through brief personal interactions that are unrelated to teaching and learning (Wolcott, 1973; Peterson, 1977). Since these studies the context of schooling has changed dramatically; most noticeable is the focus on the principal as leader of instructional change and improvement. Can the principalship still be characterized as a series of fragmented activities? Or, given the prevailing expectations of the profession and the field, do principals focus their leadership on teaching and learning? This paper helps to examine some of the conditions that affect school leaders' allocation of their time to various realms of responsibility.

The notion that principals' work context is a major determinant of their behavior is the focus of contingency theory. Principals do not merely react to their context, however. A second stream of research argues that principals' decisions about how to allocate their attention are also determined by individual attributes and characteristics, such as prior experience and formal training. This paper addresses three questions:

- (1) How do principals allocate their attention across major realms of school responsibility?
- (2) To what extent do principals in different contexts emphasize different realms of responsibility?
- (3) To what extent do individual attributes affect how principals allocate their attention across realms of responsibility?

By applying cluster analysis techniques to data from a daily log of their practices, we grouped or classified principals who allocate their attention across major realms of responsibility in similar ways. We then used a discriminant analysis technique to examine the individual attributes of the principals within the three groups and the characteristics of the contexts within which these three groups of principals work. Through this second analysis we found that principals' allocations of attention across realms of responsibility do indeed vary depending on the contextual conditions, but that such allocations do not differ systematically according to school leaders' individual attributes.

Situations versus individuals

Researchers, policymakers, and educators have called upon principals at the school site level to single-handedly exercise instructional leadership, as if to suggest it is a one-dimensional, single-focused type of leadership. Traditional calls for improvement in instruction have often identified principals as the primary force of such reform, implying that leaders should make instructional leadership their top priority. Yet, principals continually suggest that given the demands on them, it is very hard for them to maintain a focus on one aspect of their work. Interruptions, parent or teacher meetings, calls from central office, and external mandates often create the need for principals to spread their time across a number of responsibilities and activities as noted by Wolcott and others. Here, we examine what conditions shape leaders' decisions to allocate their time and attention to these competing demands.

A long debate has characterized the literature on leadership behaviors focusing on how situational and individual/personal attributes relate to leadership practices. Fiedler's (1974, p. 96) summary of these factors provides a helpful introduction:

The question is not whether people behave as they want to behave, but rather under what conditions they do what they want to do, and under what conditions the influence of situation on personality is the primary determinant of behavior . . . If leader behavior is determined primarily by the individual's "will," then we can easily teach him, or persuade him, to behave in the most effective way. If his behavior is largely determined by the situation, then our efforts to teach him how to behave will be correspondingly less successful.

His views set up a tension between contextual and individual influences, one that offers little room for interplay between these different factors. Our paper examines both types of influences first by focusing on contextual and individual characteristics as having separate influences and then as having an interactive effect on practice simultaneously.

Contingency leadership

Contingency theories emphasize the important role that context plays in determining the success of a leader. These theories argue that a leaders' effectiveness is maximized when leaders correctly make their practices and/or behaviors contingent upon the situations in which they work. Fiedler (1993, p. 2) summarized the importance of context for a leader:

[...] the main question here is how the leadership situation affects the leader and the group. I suggest that it is the degree to which the environment is structured and predictable and therefore gives the leader a feeling of control over the outcome of the task and over the group process.

Hersey and Blanchard (1982, p. 149) also stressed the fact that individual skills or attributes may not be enough to guarantee success:

[...] even with good diagnostic skills, leaders may still not be effective unless they can adapt their leadership style to meet the demands of their environment.

Contingency theories of leadership have focused on identifying aspects of a leader's context that determine what traits, skills, and behaviors are necessary for him or her to be effective in a particular situation (Yukl, 1981). Hersey and Blanchard's (1982) situational leadership framework provides the most direct theoretical foundation. They argue for the need to examine the crucial interplay between leaders and their environments, and they acknowledge the presence of numerous contextual variables that influence leaders' behaviors and practice. They highlight characteristics of the organizations' employees, or what they term employee maturity, as key in determining how and when leaders should change their behaviors to guide and motivate those individuals they supervise (Yukl, 1981, p. 141). According to their work, leaders are most effective when they modify their behavior according to the ability and confidence levels of their workers – successful leaders will treat their employees differently according to these individual characteristics (Yukl, 1981, p. 151). They emphasize that leaders must be flexible and adaptable to their environments (Yukl, 1981, p. 144); leaders who ignore these factors jeopardize their chances of success in their particular workplaces.

Despite the rather intuitive sense that contexts do influence leadership practices, relatively little research has attempted to identify the effects of different organizational and environmental contexts on principal behaviors and conduct (Manasse, 1985, p. 450-1; Hallinger and Murphy, 1985). Much of the research on school leadership has been based in elementary schools with low SES students (Manasse, 1985; Murphy *et al.*,

1983; Hallinger and Murphy, 1985), and the findings are difficult to generalize to other contexts and conditions. Even more recent work such as Spillane's (2005) examination of subject matter influence on primary school leadership still maintained its focus on K-8 schools in Chicago with high poverty rates. The limited research that has included different contexts offers a complex view of the influences of contextual variables. Lortie *et al.* (1983) found that principals in lower socioeconomic status schools were more focused on issues of student discipline and difficult staff relationships, and Hallinger and Murphy (1986) found that principals took a much more direct role in curricular and instructional issues and tended to be much more task-oriented in lower socioeconomic status schools. However, in another study Hallinger and Murphy (1985) did not find differences in principals' instructional management according to differing socioeconomic status conditions in schools. In this 1985 work they determined that school size mattered: principals in smaller schools were more involved in managing curriculum and instruction than those in larger schools, a finding previously reported by Salley *et al.* (1979). Martinko and Gardner (1983) found that principals' behaviors varied significantly with grade level and the school's degree of urbanization. In light of these findings, much work remains to be done to understand the contextual influences on principals.

Individual attributes

A second general approach in the leadership literature emphasizes particular individual attributes as key factors in understanding leader actions. Work in this area has theorized that these qualities were innate to the individual and thus "since all individuals did not have these qualities, only those who had them would be considered potential leaders" (Hersey and Blanchard, 1982, p. 83). Researchers have worked to understand better what knowledge and dispositions leaders require in order to be successful in their work. While initial empirical work on individual attributes of leaders offered only mixed findings and were largely abandoned (Zaccaro *et al.*, 2004; Hersey and Blanchard, 1982), trait theories of leadership have enjoyed recent renewed attention (Zaccaro *et al.*, 2004).

Professional knowledge is thought by many to be an important attribute of principals. Hallinger and Heck (1998) and Smylie and Bennett (2006) commented that while extensive research has focused on the practices of effective principals, little work exists that examines the strategic and practical knowledge that these school leaders use in facing different problems and issues in their work – in short, few have tried to answer how knowledge affects practice. Stein and Nelson (2003, p. 242) developed their concept of leadership content knowledge, focusing on what school leaders should know and understand about teaching and learning in schools:

We argue that administrators who profess to be instructional leaders ... must have some degree of understanding of the various subject areas under their purview ... administrators must be able to know strong instruction when they see it, to encourage it when they don't, and to set the conditions for continuous academic learning among their professional staffs.

They argued that administrators' knowledge of subject matter would influence their knowledge of how to lead. In their analysis of three leaders Stein and Nelson offered suggestions as to what principals needed to know about students' subject matter, how children learn and how teachers assist that learning, and how teachers learn to teach and how others can assist their learning. They concluded their article with the

argument that examining leadership content knowledge is integral to understanding just how leaders provide instructional leadership in schools.

St Germain and Quinn (2005) also examined the influences of principal knowledge in problem-solving situations. They argued that tacit knowledge grounded in principals' experiences ranged between leaders who demonstrated expert versus novice reactions in responding to situations (e.g. the strategies they chose, the timing in response to the conditions, and analysis of the impacts of their actions). Those who were better able to access this implicit knowledge from experience and apply it more quickly to the tasks or challenges at hand often displayed substantially different reactions to problems. St Germaine and Quinn (2005, p. 88) concluded that tacit knowledge does not necessarily vary along with years of experience, but that it is important to principal practice: "tacit knowledge essentially is untaught, but integral to successful decision making in situations in which time is limited".

Interest in potential importance of individual attributes of school principals emerged from the Interstate Leaders Licensure Consortium (ISLLC) standards. A number of articles developing the ISLLC standards argue that school leaders' "knowledge and dispositions" (Murphy and Shipman, 1999) are at the core of creating successful leaders. In an effort to present "the picture of what a strengthened profession of school leadership might look like" (Murphy and Shipman, 1999), the standards offer six central prescriptions for what principals should understand, know, and do as leaders of their schools. These descriptions of dispositions as the tendencies or proclivities that influence leaders to act in one direction over another other suggest the importance of values as well as knowledge in a principal's leadership.

Past efforts to examine leaders' individual attributes to better understand leadership have often failed to yield convincing results. Early studies frequently employed simple conceptualizations and found few differences between leaders and non-leaders. Gibb (1954, p. 889) argued that "numerous studies of the personalities of leaders have failed to find any consistent pattern of traits which characterize leaders", and Mann (1959) concluded in a review of the literature that there were insufficient correlations between leader behaviors and attributes to demonstrate consistent connections between the two. Only recently have these perspectives gained new attention as researchers have re-examined some of the earlier findings suggesting some support for the importance of personal attributes for charismatic leaders.

More recent research points to the importance of a different set of individual attributes such as cognitive abilities, personality characteristics such as extroversion, openness to experience and agreeableness, and social appraisal skills. In their 2004 review of leadership traits Zaccaro *et al.* (2004, p. 120), offered evidence for the importance of leadership traits and called for more extensive analyses of personal attributes working together: "leadership is best predicted by an amalgamation of attributes reflecting cognitive capacities, personality orientations, motives and values, social appraisal skills, problem-solving competencies, and general and domain-specific expertise".

Previous efforts to capture influences on leadership: a limited story

Research has long characterized environments for principals as interrupted, fragmented, filled with unplanned verbal interactions with staff and students, and dominated with managerial issues unrelated to instruction (Peterson, 1977). By these

and other accounts the principal's day consists of few self-initiated tasks, many activities of short duration, and an unpredictable flow of work with an emphasis on specific, concrete, and immediately pressing priorities (Pitner, 1982). These dynamic conditions present real challenges and obstacles to principals' efforts to organize and guide schools, and researchers agree that effective principals must anticipate and address these circumstances, but there has been disagreement about the extent to which principals can influence their school environments or to what degree these school conditions limit principal behaviors. Morris *et al.* (1981) portrayed principals as largely free to shape their jobs and mold conditions in their schools after their own images through different decisions and the use of "creative insubordination" to maneuver within the larger school bureaucracy to achieve their goals. According to this view effective principals used their positions in the district to acquire information and influence district-level decisions, and they decided when to bend official policy for the benefit of their schools. Later work raised questions about the direction of influence between principals and their environments. Dwyer (1984, p. 34) argued that "community" proved an important source of influence on the activities of principals", and Manasse (1985) and Hallinger and Murphy (1985) suggested that principal success may vary according to context: an individual effective in one context may not be effective in another. Salley *et al.* (1979, pp. 34-5) went a step further, asserting that school environments were key influences upon and barriers to principal actions:

Principals are captives of their environments . . . the size of the school system, size of the school, and number of grade levels in the school are organizational variables that influence the principal's definition of his or her work and militate against his or her emerging as an innovator . . . Ethnic and socioeconomic characteristics play a significant part in defining the work of the principal . . . unless some environmental characteristics, particularly those related to the organization of the school and school system, are changed, the principal rarely will be a change agent and his or her work will be routinely predictable.

According to this perspective changes in school conditions were integral to changing principal actions and behaviors. Martinko and Gardner's (1990) structured observations showed that principals' time was consumed most frequently by unscheduled meetings – they reported that "almost 40 percent were initiated by other people and less than 4 percent were scheduled. Thus large amounts of both time and events were apparently spontaneous and not controlled by managers" (Martinko and Gardner, 1990, p. 344). These statistics support the picture of principals as influenced more by other individuals and factors within their environments than vice versa.

This research leaves open the question of what factors most influence principal behavior and practices. The work that has examined the influences of principal characteristics or school context on principal practices and behavior offers few conclusions about their results. Hallinger and Murphy (1985, p. 235) offered one of the more helpful analyses for their findings when they questioned the combined effects of characteristics and context on principal practices:

In reality, individual and organizational factors are not separate forces; they interact with each other to influence behavior.

However, their examination of these interactions consisted only of a brief profile of one principal in the study whose actions they traced to both her experience and training and the conditions within her school (Hallinger and Murphy, 1985, pp. 235-6). They

conceded that the example did not offer generalizable findings but argued that it served as an example of how future research must examine “the interaction of factors that account for complex behavior” (Hallinger and Murphy, 1985, p. 236).

If examinations of contextual influences on principals have been few, even less attention has focused on different individual characteristics that may explain principal behaviors. Bossert *et al.* (1982) summarized findings from other work for three variables: gender, training, and experience. Multiple studies showed that women practiced certain types of behaviors more frequently than men (e.g. exchanging information, acting as democratic leaders, and working more hours), but much of the work was descriptive in nature. Contrary to the intuitive notion that principals with more training and years of experience would be better leaders, Gross and Herriott (1965) did not find any connections between principals’ amount of training and the Executive Professional Leadership measure that they used. Bossert *et al.* (1982) argued that these particular findings might reflect the lack of quality preparation that individuals receive before and after they become principals. Finally, as stated before, Zaccaro *et al.* (2004) cited more compelling recent evidence for leadership trait theories, and they called for more robust analyses of how these traits affect leaders’ success.

In conclusion, while contingency theories stress the importance of context’s interaction with leadership, theories of leadership attributes and characteristics provide yet another perspective on the factors that define leaders. We examine the relationship that different contextual variables have with school principals’ practices, and we analyze the relationship that certain principal attributes have with allocating time to various domains of responsibility. With these approaches we hope to contribute to the larger discussion of just what factors influence leader practices.

Research questions

The following three questions are addressed in this paper. First, to what extent can principals be grouped or classified according to the time they invest across major realms of responsibility? Second, how do the contexts in which principals work explain their allocation of time across major realms of leadership responsibility? And, third, do principals’ individual attributes explain allocation of time across major realms of leadership responsibility? We are particularly interested in exploring what explains principals’ practices: leadership context, individual attributes, or a combination of or interaction between the two.

Methodology

This paper is part of an ongoing research project on the National Institute of School Leadership (NISL). NISL is a district-level strategy that is designed to improve student achievement by arming principals with the knowledge and skills they need to lead instructional improvement efforts in their schools. As part of the larger project, data were collected during the spring of 2005 from all teachers and all principals in one urban, Southeastern district. Surveys of all teachers and all principals in the district were collected. In addition, principals responded to a daily, end-of-day log that was completed over a one-week period in the spring. A total of 46 of the principals responded to the principal survey for a response rate of 90 percent. Of the principals, 46 completed the daily log for an overall response rate of 96 percent. The total number of teachers in the district responding was 2,070 and their response rate was 87 percent.

Data were matched between the principal surveys, teacher surveys, and daily logs for a total of 46 principals to be included in the analyses.

The principals and teachers included in the analysis include the entire population of schools in the district: elementary, middle, and high schools, and special/alternative education schools. Of these schools there were 29 elementary schools, nine middle schools, four high schools, and four alternative/special education schools. We view the fact that all the principals in this study come from one district as a strength in that it holds the district context and district level policy context constant, though we acknowledge that our ability to generalize from these data is limited to similar districts.

Data collection and measures

The data in this study are based on an end of day (EOD) web log, principal surveys, teacher surveys and the Common Core of Data (see Table I).

To measure principals' emphases of time to various responsibilities all principals responded to a daily activity log. The EOD log is a web-based instrument that captured

	Measures	Mean	Standard deviation
<i>Variables for school context</i>			
Percent disadvantaged	Continuous variable from 0 to 1.0	0.59	0.20
Academic press	four-point scale from "Strongly disagree" to "Strongly agree," four items with $\alpha = 0.875$	3.24	0.26
Number of students		651.3	307.50
Teachers' average number of years teaching		14.16	2.85
Student engagement	Four-point scale from "Serious problem" to "Not a problem;" Three items with $\alpha = 0.697$	2.66	0.54
<i>Variables for individual characteristics</i>			
Principal's average perceived competence	Five-point scale from "A little" to "A great deal," six items with $\alpha = 0.94$	3.77	0.71
Principal's reported impact of professional development	4-point scale from "Strongly disagree" to "Strongly agree," 4 items with $\alpha = 0.897$	2.99	0.57
Number of years as administrator		13.02	6.19
Gender	1 = Male, 2 = Female	1.67	0.474
<i>Leadership practice reports by principal (hours per week)</i>			
School district functions		1.47	2.24
Finances		2.11	2.32
Professional growth		2.45	2.88
Planning setting goals		2.90	2.36
Building operations		3.40	2.63
Community/parent relations		3.96	3.77
Personnel issues		5.10	4.21
Instructional leadership		8.04	6.38
Student affairs		9.97	6.36

Table I.
Mean and standards
deviations of variables in
the analyses

principals' engagement in leadership functions and activities for a single school day. Principals were instructed to keep a record of their daily activities on a small calendar note card given to them by the research team. The main part of the EOD instrument is a calendar in which principals reported how they allocated their time to nine major realms of responsibility during each hour of the day between 6 a.m. and 7 p.m.

- Building operations: schedules, space operations, building maintenance, vendors.
- Finances and financial support for the school: budgets, budget reports, seeking grants, managing contracts.
- Community or parent relations: formal meetings and information interactions.
- School district functions.
- Student affairs: attendance, discipline, counseling, hall/cafeteria monitoring.
- Personnel issues: recruiting, hiring, supervising, evaluating, problem solving.
- Planning/setting goals: school improvement planning, developing goals.
- Instructional leadership: monitoring/observing instruction, school restructuring or reform, supporting teachers' professional development, analyzing student data or work, modeling instructional practices, teaching a class.
- Your professional growth: formal professional development, attending classes at a college/university, reading books or articles.

Principals completed the EOD log for six consecutive school days stretched over two weeks.

To measure individual attributes of the school principals, a web-based principal survey was used. Specifically, we measured knowledge, background characteristics, and professional development. To measure principals' knowledge we used a measure of principals' perceived competence that averaged principals' self-reported knowledge in key areas related to school leadership. The stem for each item read "To what extent do you currently have personal mastery (knowledge and understanding) of the following:" and asked principals about standards-based reform, effective teaching and learning, developing a school learning environment, monitoring instructional improvement, communication, and team-building. The alpha reliability coefficient for this measure was 0.94. This measure, although based on self-reported levels of knowledge, is consistent with leaders' responses on open-ended problems that were coded for similar knowledge domains (Goldring *et al.*, 2006). Other individual attributes measured on the principal survey included the number of years of experience in school leadership, gender, and a report of the principals' assessment of the quality and impact of their professional development. This measure is another aspect of a principal's ongoing knowledge development. Principals responded to the stem, "To what extent do you agree or disagree with the following statements about your professional development experiences this year? My professional development experiences this year . . ." The items included "made me pay closer attention to particular things I was doing in my work," "led me to seek out additional information from another school leader, teacher, or some other source," "led me to think about an aspect of my work in a new way," and "led me to try new things in my practice or work" ($\alpha = 0.892$).

To capture key aspects of the school organizational context as a measure of the principals' context, we measured students' levels of engagement and teacher academic

press on the teacher survey. We use these two measures of organizational context because much of what determines principals' "contexts" is how teachers and students conduct themselves. Faculties who are enthusiastic and actively promote student achievement present principals with a much different leadership context than faculties which are apathetic and set low standards. Likewise, schools in which families and students are actively and constructively engaged in learning and the support of learning present a much different context to principals than schools with less engaged students and families. Specifically, there is considerable support for the notion that academic press is an important aspect of school improvement. Lee and Smith (1999, p. 912) suggest that press toward a common goal, focus, and purpose serves to "set a normative environment that motivates its members to behave in desirable ways". Academic press is linked to the notion of high expectations for all students and is often considered an organizational property of schools. A school's level of academic press is a measure of the extent to which teachers focus on academic excellence and the professional and academic standards in the school support learning. A school that is focused on student learning and achievement includes such aspects as a maximization of instructional time, high expectations for all, and a normative culture or climate focused on learning (Lee *et al.*, 1999). We measured the schools' aggregate level of academic press from teachers' reports of the level of academic press that exists in the school. Items in this scale asked teachers to report on the following conditions: "teachers in this school expect students to complete every assignment," "teachers in this school encourage students to keep trying even when the work is challenging," "teachers in this school set high expectations for academic work," and "teachers in this school think it's important that all students do well in their classes" ($\alpha = 0.863$).

Our measure of student engagement is an attempt to capture the senses of connection between the student, his/her home and the school. Student engagement in this sense is somewhat different from the idea that a student is actively engaged in the academic work or the instructional activities of the school (Marks, 2000). We follow the work of Finn (1989, 1993) in viewing student engagement as a sense of belonging to the school – accepting its norms of participation and behavior. Clearly, higher student engagement is related to a more stable, less complex school climate and research has linked student engagement to academic achievement (Finn *et al.*, 1995). Leithwood and Jantzi (2000) studied the effects of transformational leadership on student engagement, thus conceptualizing student engagement as an educational outcome while we are suggesting it is part of the school context at any given time. (We are not suggesting that it is not alterable, however). Teachers' reports of student engagement in their schools asked teachers the extent to which the following are a problem at their school: "Student absenteeism," "lack of parental support or participation," and "students' use of drugs or alcohol"; the items had a reliability of $\alpha = 0.697$. We also included aggregated averages for the teachers' number of years teaching, another important contextual measure. Questions in these constructs targeted key factors that influence student engagement, and participants responded on a Likert scale of 1 ("Serious") to 4 ("Not at All"). Higher scores on these constructs indicated that such obstacles as student absenteeism or student drug use were less of a problem for student engagement.

Additional contextual measures included a measure of the percent of disadvantaged students for each school and the number of students in each school. These data came

from the Common Core of Data web site, which provides key school-level data for schools throughout the country. A measure for the percentages of black students in each school was considered, as was a variable of the school level (elementary, middle, etc.). However, the ethnicity variable correlated highly with the percent disadvantaged (0.845, significant at 0.001), and school level correlated highly with the number of students (0.832, significant at 0.001). Because of the intercorrelations between these variables we included only school size and percent disadvantaged variables in our analysis.

Data analyses

To address the first question, to what extent can principals be grouped by their tendencies to allocate their time across major realms of responsibility we used cluster analyses. The analysis used to cluster principals involved two stages. In the first stage, response data from the principal activity logs were summed over the six-day logging period for each of the nine categories of activities for each principal. This produced an activity profile for each principal, where the total amount of time spent on each of the nine types of activities was coded as hours per week.

In the second stage of analysis, the activity profiles for the 46 principals were submitted to a cluster analysis in order to group principals with similar activity profiles. The clustering method used to group similar activity profiles was agglomerative hierarchical clustering using Ward's minimum variance method. This method seeks to create clusters that minimize the variance between observations within each cluster and maximize the variance between clusters. In other words it seeks to create homogeneous clusters of principals with similar activity profiles, where the average profile for each cluster is as distinct as possible from those of other clusters. Because the time spent on each activity is measured on a ratio scale, the raw values are used to calculate distances between observations and clusters (i.e. no transformation of the data was performed). The number of clusters in each analysis was determined by the largest increase in within cluster variance to between cluster variance (i.e. the semi-partial *r*-squared, SPRSQ). The point at which clustering was stopped was the point in the clustering process at which the joining of two clusters produces the largest decrease in the separation between clusters (i.e. the largest increase in the SPRSQ). In other words, clustering stops before the two most different clusters are merged into one. Other indicators for determining the number of clusters proved to be unhelpful due to the small number of principals ($n = 46$) and significant positive skew in the data. The results of the cluster analysis are depicted visually through an average activity profile plot. This plot shows the average number of hours per week principals in each cluster spent on the nine types of activities. Means and standard deviations of hours spent on each activity are also presented for each cluster in order to summarize the natures of these groups.

To address the second and third questions, to what extent do contextual and/or individual attributes explain principals' emphases of various realms of responsibility, we used discriminant analyses. Discriminant analysis is a multivariate procedure that distinguishes between groups of respondents on the basis of a series of discriminating variables. These analyses were performed to determine which sets of contextual and individual measures would best predict principals' leadership behaviors (as determined by the cluster analyses above). The goal of discriminate analyses is to

find a linear combination of variables that explains the variability among clusters of principals (i.e. differences in the patterns of leadership behavior). In other words, the discriminant analysis seeks to find the contextual and individual attributes that differentiate the clusters of principals.

What influences
principal
practice?

Results

Classifying principals by their allocation of time

First we describe the average allocation of principals' time to the various realms of responsibility. As noted in Figure 1, on average, the principals in our sample spend the most time on student affairs (ten hours per week) and instructional leadership (eight hours per week). They are able to allocate some sustained time to these activities. They spend the least amount of time on school district functions and financial management (2.1 hours per week). They spend limited amounts of time on their own professional development and parent and community engagement.

The first sets of analyses ask, can principals be grouped by their tendencies to allocate their attention across major areas of responsibility? Three clusters of principals were revealed based on the aggregated activity profiles; the results of the cluster analyses indicate the principals are differentiated according to their emphasis on certain areas of responsibility that were measured in the end of day log. Principals in the three clusters did report differences the time spent in the various areas of responsibility. Table II presents means and standard deviations of hours per week principals spend on nine activities for three clusters of principals while Figure 2 shows mean activity profile plots for each of the three clusters.

The first cluster of leaders we term Eclectic Principals. This cluster includes 17 principals from the district. Eclectic Principals, are distinct in that their activities do not focus on or emphasize particular realms of responsibility but are distributed more evenly across the different activities than either of the other two groups. They tend to

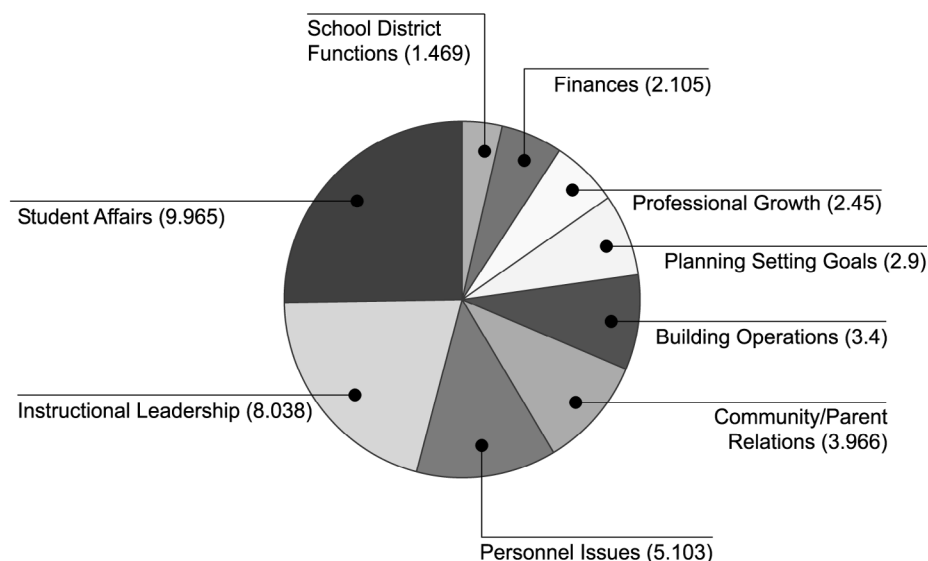


Figure 1.
Overall reports of
principal practice from
daily logs (in hours/wk)

Table II.
Means and standard
deviations of hours per
week principals spend on
nine activities for three
clusters of principals

	Cluster 1: Eclectic <i>n</i> = 17		Cluster 2: Instructional Leadership <i>n</i> = 21		Cluster 3: Student Centered <i>n</i> = 8	
Building operations	3.2	(2.6)	4.1	(2.8)	2.8	(1.8)
Finances	1.9	(2.3)	2.2	(2.6)	2.7	(1.6)
Community or parent relations	2.8	(3.2)	5.7	(4.3)	2.4	(1.7)
School district functions	2.0	(2.8)	1.3	(2)	1.2	(1.5)
Student affairs	6.5	(3.3)	9.8	(4.2)	19.6	(6.6)
Personnel issues	7.2	(5)	3.5	(3.1)	6.1	(2.8)
Planning setting goals	1.9	(1.4)	3.9	(2.7)	2.7	(2.4)
Instructional leadership	4.0	(2.5)	13.4	(5.8)	3.7	(2.6)
Professional growth	2.7	(3.6)	2.6	(2.5)	2.3	(2.6)

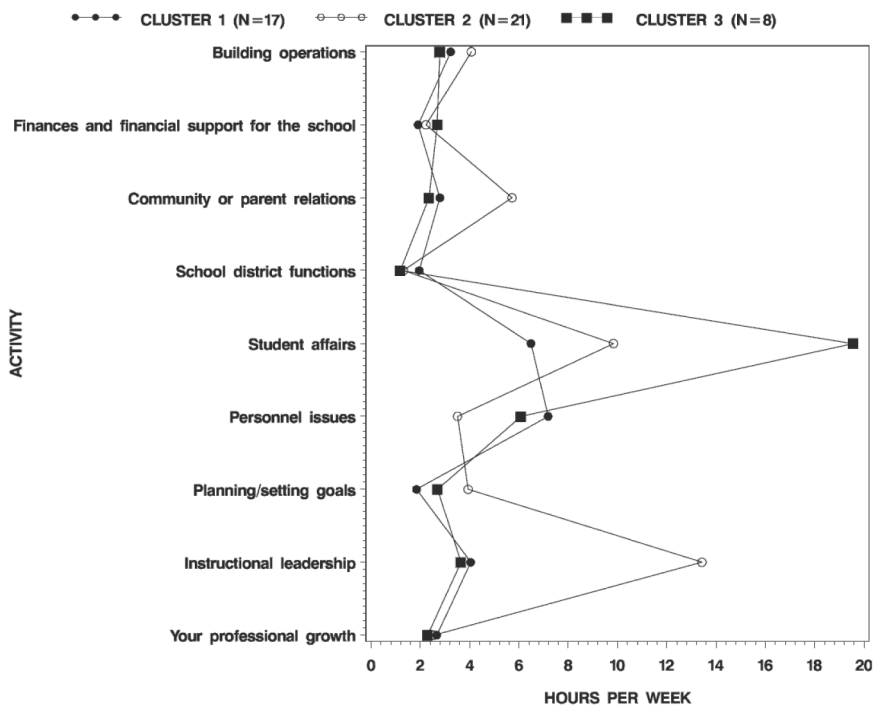


Figure 2.
Mean activity profiles for
three clusters of principals

spend less time on Student Affairs and more time on Personnel Issues (seven hours/wk). This group seems to be most consistent with the literature in that their activities seem to be more fragmented or distributed across a larger number of emphases.

Cluster 2 leaders we term Instructional Leaders. These principals are distinguished from the other two groups in that these principals tend to spend the most time on

Instructional Leadership (13 hours/wk). They also report considerable time on Community/Parent Relations (six hours/wk) and Student Affairs (9.8 hours/wk), suggesting this group may be particularly drawn to interacting with people and leading through people. Dwyer (1984) and Bossert *et al.* (1982) comment on how principals who focus on instructional leadership issues also understand the importance of engaging others to be a part of a school's instructional vision. Dwyer (1984) in particular describes principals from his study who used their connections with students and community members to foster the instructional organization of their schools. They viewed these relationships as necessary and pivotal to communicating the vision for the school and encouraging others to be a part of it. The instructional leadership principals also spent the most time on planning and setting goals, perhaps related to their working with people to implement their plans.

Cluster 3 principals we term Student-centered Leaders. These principals are distinct in that they tend to spend by far the most time on Student Affairs (almost 20 hours/wk). There was little difference between the three clusters in terms of the amount of time spent on building operations, school finances, school district functions, or professional growth.

In sum, in the district we are studying, principals can be classified into three distinct groups according to how they spend their time. Principals in the eclectic group, divide their time across a larger number of activities, while principals in the other two groups, instructional leadership and student focused leaders, have more emphasis on one type of activity. Having determined these differences between groups of principals, we next use principals' cluster assignments to examine what contextual and individual factors can account for differences in the group assignments.

Identifying influences on time allocation

This section of the analysis applied discriminant analyses using the principals' cluster membership as grouping variables and principal attributes and school contexts as the discriminating variables. The goal of such analyses is to locate linear combinations of variables that maximize the differences between groups and allows one to predict classification. Our analyses focus on determining which whether principal attributes or school contexts explain the groupings into the three clusters[1]. Because of the small sample size each discriminant analysis includes up to a maximum of five variables.

First, we analyzed the extent to which principal attributes could discriminate or distinguish amongst the three clusters of principals. When we analyzed individual attributes, no significant discriminant functions were found. These attributes included principals' perceived knowledge, the number of years of experience, their reported impact of professional development upon their practice, and gender. Principal individual attributes did not significantly distinguish between the Eclectic Principals, Instructional Leaders, or Student-centered Leaders, suggesting that these characteristics on their own did not significantly influence principal reports of these activities.

Next, we included the following measures as discriminating variables in our analyses to examine contextual factors on principal reports of the time allocation: the percentage of disadvantaged students, the number of students in the school, teachers' average number of years teaching in each school, the level of academic press in each school, and the level of student engagement in each school (see Table III). One

significant discriminant function was calculated for these contextual measures suggesting that contextual factors can distinguish amongst these three groups of principals. The analyses yielded a Wilks' lambda of 0.598 with a chi-square of 21.103 and a *p*-value of 0.02. The canonical correlation coefficient indicated that the variables we included in this analysis had strong predictive power (i.e. the function correctly accounted for 65.5 percent of the variance in the classification of the groups).

Using the group centroids for the clusters (the distance between the groups from the mean or 0 point of the discriminant function) to determine the basis for the comparison (Table IV), we find that the function distinguishes between the Eclectic Principals and the Instructional Leaders and the Student-centered Leaders. That is, Eclectic principals are significantly different from those who do have a more dominant level of activity focus, be it on student affairs or instructional leadership. According to these analyses, we have two broad groups of principals – those who lead by distributing their time across a larger number of activities and those who are more focused. In other words, principals who focus on student affairs or instructional leadership (clusters 2 and 3) are indistinguishable based on the factors we measured, but both are empirically distinct from the Eclectic Principals.

Next, we present the standardized canonical discriminant function coefficients in Table III. These coefficients permit us to compare the magnitude or importance of each contextual variable, regardless of how it was measured, in classifying the groups of principals. Disregarding the signs for a moment, the level of academic press in schools (1.162), the level of student engagement (– 1.276), and the percentage of disadvantaged students in schools (.650) were the three factors most important in distinguishing between Eclectic Principals and the other two clusters of school leaders who indicate a focused activity.

The structure coefficients in Table III are the correlations between the contextual variables and our function; they may be thought of as factor loadings of each variable on the discriminant function. Looking at these values (in conjunction with the group centroid, because the group centroid is negative we reverse the sign of the coefficients)

Table III.
Standardized coefficients
and structure coefficients
for predicting principal
practices according to
contextual variables

Contextual variables	Standardized canonical discriminant function coefficients	Structure coefficients
Academic press	1.162	– 0.213
Student engagement	– 1.276	– 0.638
Percent disadvantaged	0.650	0.670
Teachers' average number of years teaching	0.051	0.038
Number of students	– 0.101	0.039

Table IV.
Functions at group
centroids

Cluster	Function
Eclectic Principals	– 0.771
Instructional Leaders	0.358
Student-centered Leaders	0.698

we learn that Eclectic Principals tend to come from schools with higher academic press (-0.213), higher student engagement (-0.638), and lower percentages of disadvantaged students in their schools (0.670). Eclectic principals are leaders in less disadvantaged schools and thus may be reacting to their environmental stability through spending time on varied activities and leadership responsibilities. They may have more staff capacity (high academic press) to take on the instructional tasks with a more supportive school climate. Or, these principals do not engage in as much instructional leadership or student issues because they feel that students are doing what they should be doing, the school is working well, and instructional change is not necessary.

We note the Eclectic Principals (see Table V) are most likely to work in elementary schools and medium size schools. These principals may have the “luxury” of addressing a number of needs simultaneously instead of focusing on specific conditions within the schools. On the other hand, principals who focus on student

	Number	Mean	SD
<i>Eclectic Principals</i>			
% disadvantaged		0.44	0.18
% Black		0.52	0.25
Student engagement		3.01	0.50
Academic press		3.31	0.34
Number of students		598.2	245.10
School level	10		
Elem	3		
Middle	0		
High	1		
Alt			
<i>Instructional Leaders</i>			
% disadvantaged		0.61	0.19
% Black		0.77	0.18
Student engagement		2.36	0.44
Academic press		3.19	0.22
Number of students		858.6	425.2
School level			
Elem	4		
Middle	4		
High	3		
Alt	1		
<i>Student-centered Leaders</i>			
% disadvantaged		0.76	0.19
% Black		0.81	0.21
Student engagement		2.31	0.71
Academic press		3.19	0.32
Number of students		315	165.50
School level			
Elem	2		
Middle	0		
High	0		
Alt	2		

Table V.
Descriptive contexts for
correctly predicted
principals in discriminant
analysis

affairs or instructional leadership are more prevalent in disadvantaged schools. Their focus may be influenced by accountability pressures to improve instruction and the learning environment in their schools. Taken together these findings suggest that not all principals are fragmented in their activity level, while contextual aspects of the principals' organization are important to understanding the level of fragmentation.

In our final analysis, we included factors that measured individual attributes (perceived knowledge in key areas) and context (percent disadvantaged, average years teaching, student engagement, the level of academic press in the school) in an attempt to determine if including both two types of measures would better explain differences in principal allocation of their time in terms of activity focus. We did not find an improved prediction in the function when including both types of variables, and in fact, the classification results were lower. Contextual factors alone best explained principals' reports of practice; these final results point again to the important influences of context on principal practices.

Implications for the field: the situated nature of leadership

For decades the field has been calling for school principals to focus on instructional leadership, or learner-centered leadership (Murphy and Vriesenga, 2006) as evidenced by the ISLLC standards and the re-design of many principal certification programs. However, research tends to suggest that principals are not "doing" enough instructional leadership and that many principals continue to be fragmented and pulled between managerial and leadership activities and functions.

From a theoretical perspective, leadership theory has posited that situations and contexts are crucial for establishing effective leadership. There are numerous aspects of the context within which leadership takes place that could influence that nature of leadership. Student body composition, staff composition, and level of schooling can all have a bearing on the challenges leaders face. Numerous frameworks such as that of Bossert *et al.* (1982) and Dwyer (1984) have conceived of contextual factors as influencing principal behavior, but the empirical work is limited when we look more closely at exactly what different contextual measures have been examined. First and foremost, much of what we know in this area has come from research on effective schools that focused primarily on urban elementary schools with low-income and high-minority student populations; generalizability from these findings is arguably low (Hallinger and Murphy, 1986). In those studies that did focus more closely on contextual variables, such as socioeconomic status (Lortie *et al.*, 1983; Hallinger and Murphy, 1986, 1985; Hallinger *et al.*, 1996), size (Hallinger and Murphy, 1985), grade level and degree of urbanization (Martinko and Gardner, 1983), and level of parent involvement (Hallinger *et al.*, 1996), the mixed and sometimes contradictory results in these efforts present a limited picture of just what role context plays on leadership. While the effects of context are theoretically attractive in studying leadership, the empirical results leave much to be answered in this area. We believe that our findings contribute to this area by reporting results from schools of differing socioeconomic status, teacher expectations, and student engagement from one district.

In the case of our district under study, principals' emphases on various leadership activities do differ. In fact, we found that on average, principals emphasize instructional leadership about nine hours per week. Principals can be classified into three distinct clusters according to the ways in which they allocate their time across

varied leadership activities. The eclectic principals spend time on more varied activities, while two other clusters of principals are more focused, one cluster on instructional leadership and one cluster on student affairs. Our first conclusion is that not all principals seem to be distributing their leadership across a wide array of activities in the same manner, and in fact there is a group of principals that spend a larger amount of time during a week on instructional leadership. This group of principals spends as much as 13 hours per week on instructional leadership. (Admittedly, we do not have a mechanism to evaluate whether this is a lot or a little.)

Our results point to the power that contextual factors may have on leaders' practice. The factors that significantly distinguished between the three clusters of principals are contextual conditions. Principals seem to prioritize and focus their actions under more challenging contextual conditions. Eclectic Principals work in schools where students come from less disadvantaged backgrounds and teachers hold higher expectations for student achievement and students are more engaged. One must question if these situations provide the opportunities for Eclectic Principals to spread their actions more widely in an effort to address varied leadership needs within the school. Given the student body and teacher expectations, perhaps these Eclectic Principals can distribute leadership more widely in the school. It should be noted that Eclectic Principals work in elementary schools. Principals working with students who are more at-risk focus their activities on instructional leadership and student affairs. Student-centered principals work in smaller schools than instructional leadership focused principals[2].

Our measures of personal attributes are limited in their emphases and did not distinguish amongst groups of principals. Rather than draw conclusions from these data regarding the lack of influence of leaders' personal attributes, we emphasize here the need to examine the role of leader attributes using more complex measures, such as persistence, openness and social appraisal skills. If anything, our work points to the need to continue analyses of the effects of leaders' characteristics.

Our study highlights the role that context may play in understanding school leadership. Principals may focus their time on important instructional leadership activities more than prevailing wisdom suggests. The obvious next step in our analyses is to determine how the various leadership clusters are related to important school outcomes. These results do however raise important questions about how to think about the allocation of principals' time. For example, there is a movement underway in some districts to hire business assistants for principals so they can spend more time on instructional leadership, thus leaving other duties to the business managers. A preliminary study in Jefferson County, Kentucky, suggested that increased achievement is associated with increased time on instructional leadership when a business assistant takes on many of the managerial tasks previously handled by the school principal (Shellinger, 2006). We must ask is more instructional leadership always the best allocation of all principals' time? Is more always better? Is there a linear relationship between time spent on instructional leadership and student achievement, regardless of school context? Are there any trade offs or down sides to principals spending more time on instructional leadership? What is the role of other leaders in the school and distributed leadership when undertaking a study of the allocation of time of the school principal? This paper begins to focus our attention on the ways in which principals spend their time and the role context can play in the study of principals' leadership.

Notes

1. We selected only those principals for whom we had cluster data and full principal and school-level data in the measures below; and therefore in some of the analyses a total of 43 subjects were included (Survey items for three principals were missing from those individuals included in the cluster data, and analyses of possible imputation strategies showed correlations between these items and others that were not high enough to warrant imputation; listwise deletion was thus used for these three from the original 46 with matching data between the principal surveys and cluster analyses.)
2. Univariate ANOVA indicates statistically significant differences among the three clusters on student enrollment, percent disadvantaged students and student engagement

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