

Portraits of Principal Practice: Time Allocation and School Principal Work

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Abstract

Purpose: The purpose of this study was to examine how school principals in urban settings distributed their time working on critical school functions. We also examined who principals worked with and how their time allocation patterns varied by school contextual characteristics. **Research Method/Approach:** The study was conducted in an urban school district with approximately 50 school principals and utilized self-reported End of Day log data collected at multiple points in between 2005 and 2007. We utilized hierarchical linear models to analyze variation in principals' time allocation by time (hour, day, semester), school function (building operations, student affairs, district functions, etc.), and school personnel (self, teacher, student, etc.). **Findings:** Variation in principals' practice is domain dependent. Consistent with prior research, we find that a principal's workday is characterized by long hours and diverse tasks. We find little support for the notion that typical tasks are characterized by brevity. Principals also spend most of their time working with within-building colleagues rather than working alone. Of all predictors we examined in the study, only hour of

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the day predicts principals' time allocation on different functional domains. **Conclusions:** The portrait of principals' work described in this study expands and enriches the field's current understanding of how principals allocate their time across the multiple domains of responsibility that require their attention. We find that our data offer support for some of popular conceptions of principals' work described in the research literature while challenging other common conceptions.

Keywords

principal practice, school leadership, End of Day (EOD) logs, survey data, distributed leadership

The work of school principals has become increasingly complex. Principals must spread their time over many responsibilities and must work with a wide array of stakeholders. Dramatic changes in the policy environment of public schools over the past two decades have placed additional demands on principals to address multiple and diverse responsibilities, resulting in significant constraints in how principals spend their workdays (Grissom, Loeb, & Mitani, 2015). Given this, it is important to understand how principals allocate their time to different responsibilities in order to gain a better understanding of the nature of their work, its possibilities, and limits. Recent changes in teacher evaluation policies and some principal professional development initiatives appear to assume that principals have sufficient capacity to add substantial responsibilities to what they already do. Moreover, the contemporary press for distributed models of leadership that emphasize the role of other school leaders in addition to the principal further complicate the already difficult work of principals. Hence, it is important to examine principals' time allocation patterns, including their allocation of time to working with others in the building.

Considerable research has been devoted to describing principals' workdays and their time allocation patterns, but there are a few limitations of this work. One limitation of this body of work is that few studies examine how principals allocate their time across a comprehensive range of domains for which principals are responsible. A significant portion of empirical research on principal leadership practice focuses on a narrow range of principals' responsibilities, and in doing so, often ignores other important areas of responsibility. For example, consider the major attention given to instructional leadership in the literature (Hallinger, 2005; Hallinger & Heck, 1996, 1998; Neumerski, 2013). These studies focus on the direct or indirect role of

principals in supporting classroom instruction but often ignore other important aspects of principals' work such as human resource management, the management of school finances, and developing and maintaining the school's physical plant. While such studies could provide guidance about how principals should prioritize their time, the usefulness of such guidance is limited without a baseline understanding to use as a benchmark.

A series of time allocation studies conducted in the 1970s and 1980s endeavored to comprehensively account for how principals allocate their time. These studies, which include Wolcott's famous ethnography of a single principal, *The Man in the Principal's Office* (1973), and subsequent research based on structured observations (Kmetz & Willower, 1982; Martin & Willower, 1981; Peterson, 1977), still motivate many current notions about the principals' workday. Yet, since these studies were undertaken, the educational policy environment of public schools has changed considerably with the emergence of standards-based reform and high-stakes accountability. These policies emphasize and incentivize principal involvement with instruction and its improvement (e.g., teacher observation and evaluation) and likely have contributed to altering how principals allocate their time. Moreover, principal practice is coming under increasingly intense scrutiny through changes in principal evaluation systems, and such changes will undoubtedly influence how principals spend their time. Given the shifting landscape of public schooling, the findings from the early time allotment studies may no longer be applicable to current conditions.

A second limitation of the research base is that many of the earlier observational studies were based on a few principals, limiting their generalizability to the immense diversity in today's education settings. Equally important, more recent observation and survey-based studies that are based on larger samples of principals have most often examined only a brief period of time and have failed to capture a full year of principals' work life (e.g., Camburn, Spillane, & Sebastian, 2010; Goldring, Huff, May, & Camburn, 2008; Grissom, Loeb, & Master, 2013; Spillane & Hunt, 2010). The narrow window of data collection used in these studies has limited researchers' ability to examine within-principal variation in time allocation patterns—from day to day, semester to semester, and across years. Prior research on principals' workdays has also focused more on variations between principals in their time allocation, and research is thus lacking on how a principal's workday varies temporally and what factors influence this variation.

A third limitation of the empirical research base on principal practice is that conceptions about school leadership have also changed since the early studies were undertaken. From images of a solitary heroic leader, usually male, that were prevalent during that time, current models of school leadership go

beyond the principal and conceive of leadership as distributed, based on daily interactions among school personnel (Spillane, 2006; Spillane, Camburn, & Pareja, 2007; Spillane, Halverson, & Diamond, 2004). Other current conceptions of school leadership similarly focus on notions of shared and collective leadership (Leithwood & Mascall, 2008). Given the increasing prevalence of these alternate models of leadership in research, the limited empirical evidence on how school principals allocate time working with teachers and other school personnel is surprising. The long-standing idea that principals exercise leadership by influencing others (Bossert, Dwyer, Rowan, & Lee, 1982) strongly suggests we need to look at data that describe not only what principals work on during their workday, but also who they work with.

Finally, there is limited work examining how school context influences principals' workdays and their time allocation to different leadership responsibilities (Goldring et al., 2008). While it seems intuitive that factors such as school level (elementary/middle/high), school size (enrollment), diversity of student body, and students' academic performance will influence how principals' workdays unfold, there is limited empirical evidence on this matter. Work by Goldring et al. (2008) examined how context influences whether principals take an eclectic approach by distributing their work over multiple responsibilities, or take a more focused approach. However, there is little research that examines the importance of context in principals' time allocation over specific leadership responsibilities, variation in leadership practice over time (daily and seasonal), and their distribution of work with others.

In this article, we take a step in addressing these shortcomings in the literature based on a study of the time allocation of all school principals in one urban school district sampled over the course of several academic years. We utilized self-reported End of Day (EOD) log data from this district, collected at multiple points between 2005 and 2007, to examine variation in principals' time allocation by leadership function and their interactions with other individuals during the course of their work. We also examined how principals' time allocation varied across a few important contextual variables—school level, school size, academic performance, student diversity, and student poverty.

Motivating and Framing the Work

Scholars in organizational research have long considered leaders' time allocation patterns as critical to understanding leadership (Oshagbemi, 1995; Wolcott, 1973). Many popular models of organizations indeed originate from time constraints faced at various levels of hierarchy that lead to innovations for distributing and delegating authority and responsibility (Bandiera, Prat, Sadun, & Wulf, 2012). Mintzberg (1973) argued that if we do not know what

it is that organizational managers do, we cannot measure their impact, prepare people for management positions, develop effective professional development programs, or enable organizations to improve. Specifically, scholarship must document the critical aspects of managerial practice including the kinds of activities performed, with whom managers work and how frequently, as well as variations in their practice.

Educational research on school principals' work and time allocation shows that principals engage in a wide range of activities and interact with multiple constituents (Camburn et al., 2010; Grissom et al., 2013; Grissom et al., 2015; May, Huff, & Goldring, 2012; Spillane et al., 2007). They distribute time among numerous responsibilities and work with multiple stakeholders that contributes to severe time constraints in their everyday work. Given these constraints, effective time management has become increasingly important for school principals (Grissom et al., 2015). The emergence of accountability systems that require principals to invest a considerable amount of time in teacher observation and evaluation imposes further constraints on principals' time (Murphy, Hallinger, & Heck, 2013).

Time allocation patterns of school principals have been linked to important school outcomes including student achievement gains (Grissom et al., 2013; Grissom et al., 2015; Horng, Klasik, & Loeb, 2010). Besides school outcomes, principals' time allocation can influence personal and organizational variables such as lower job stress, improved school climate, and better parent perceptions of the school (Grissom et al., 2015; Horng et al., 2010). Since time is a scarce resource for principals, understanding how they spend their time and with whom can be beneficial in guiding school reform and improvement efforts.

Given the importance of principals' time allocation, it is not surprising that there is a substantial body of research that has focused on the principals' workday. Wolcott's (1973) classic ethnographic study of a single elementary school principal is one of the earliest and most influential studies on the principals' workday. At a time when the image of a "heroic solitary leader" dominated school leadership theory and research, Wolcott (1973) carefully documented the proportion of time principals spent working with other school personnel. He observed that "the greatest part of a principal's time is spent in an almost endless series of encounters; from the moment he arrives at school until the moment he leaves. Most of these encounters are face-to-face, tending to keep the Principalship a highly personal role" (p. 88). Wolcott catalogued these encounters and estimated that a principal spent only 24% of his time alone. Despite this observation, Wolcott's work actually popularized the image of the principal as a lone ranger (Spillane & Hunt, 2010). Wolcott also documented seasonal changes in principal practice, finding intense or

intermittent activity throughout the school year on most activities. Examples of these patterns included less time spent on parent and community relationships in the winter and more time spent on teacher evaluation in winter. Activities associated with preparation for the upcoming school year, such as interviewing and ordering supplies occurred more often in spring, whereas budget work occurred less often in early fall and late spring. Few subsequent studies have examined such seasonal variation.

Subsequent research used observational methods to study the workdays of principals (e.g., Kmetz & Willower, 1982; Martin & Willower, 1981; Peterson, 1977). In general, these studies found that principals' work was characterized by long hours, numerous tasks, a frenzied pace, brevity, and fragmentation. These studies found that principals worked for about 50 hours a week and participated in more than a hundred different activities a day with few activities lasting for more than 10 minutes. Martin and Willower (1981) found that the modal time reported for an activity was 1 minute. Another theme from these studies was that principals spent a considerable amount of time on managing or running the building and considerably less time on instruction related activities. Peterson (1977) estimated, for example, that principals spent only 6% of their time on curriculum and instruction. Other studies reported higher estimates. For example, Kmetz and Willower (1982) found that elementary school principals spent about 27% of their time on instruction-related activities, whereas secondary school principals spent about 17% of their time on this activity (Martin & Willower, 1981). These earlier studies also documented that principals spent little time in reflective planning and interacted mostly with people within their building spending only about 10% of their contact time with external entities (Kmetz & Willower, 1982; Martin & Willower, 1981).

Images of the principals' work as varied, brief, fragmented, internally focused, cyclical, and heavily administrative endure from earlier research, but a key issue concerns their relevance in today's educational policy context. The literature discussed above predates the standards and accountability movement that has fundamentally transformed the environment of most U.S. schools. A study of school principals' work using Experience Sampling Methodology¹ (ESM; Spillane & Hunt, 2010) found some support for principal work as being heavily administrative, but did not find support for the lone ranger image nor the brief, constantly shifting portrayal of principal work. Instead principals in this study reported spending an average of 29 minutes on each task that they reported working on.

While the early studies shaped popular conceptions about principals, they were often based on small samples. In recent years, several studies have used multiple instruments such as surveys, EOD logs, observations, and ESM

methods to examine the workday and time allocation patterns of principals (Camburn et al., 2010; Goldring et al., 2008; Grissom et al., 2013; Grissom et al., 2015; Horng et al., 2010; May et al., 2012; Spillane et al., 2007; Spillane & Hunt, 2010). Although these recent studies used relatively larger samples of principals, many of them focused on a narrow window of time. Observations from a single day or survey data from 1 week may not accurately represent principal behavior over longer periods of time such as a school year, especially considering the seasonal variation suggested by prior work. Collecting workday information over a narrow window of time also limits the ability of researchers to understand how principals' time allocation patterns vary over time—from day to day, week to week, and over the course of an academic year.

Studies of school principals based on annual surveys (e.g., Lee & Hallinger, 2012) are also unable to examine temporal patterns in time allocation. When surveys require participants to recall events over greater durations of time, bias from memory recall issues may creep in (Tourangeau, Rips, & Rasinski, 2000). To overcome issues related to recall bias, studies have used EOD log data (e.g., Camburn et al., 2010; Goldring et al., 2008; May et al., 2012; Spillane et al., 2007) and ESM (Camburn et al., 2010; Spillane & Hunt, 2010; Spillane et al., 2007), which require more frequent reporting. Data collected from daily instruments are more accurate than one-time surveys because of the shorter time elapsed between events and data collection (Camburn et al., 2010; Camburn, Han, & Sebastian, 2015; Tourangeau et al., 2000). While studies such as May et al. (2012) used data from daily logs that were collected across several years, they did not utilize these data to examine temporal patterns in principals' time allocation.

Many studies of principals' time allocation focus on differences between principals, often in an effort to link them to differences in school effectiveness. However, studying variation *within principals*, for example, how practice varies from hour to hour, day to day, and throughout the course of a school year, is important if we are to develop more nuanced understandings of principal leadership. Seasonal fluctuation in principals' work activities also needs to be reexamined in light of changes in the education policy environment over the past two decades. Furthermore, shorter term variation such as hour-to-hour, and day-to-day variation, and factors influencing this variation also merit attention. In this article, we take a step in this direction by examining such variation *within principals* in their time allocation choices.

Another gap in research on principals' time allocation is a lack of understanding of the ways in which principals engage with others in their work. In our view, the popular image of the principal as lone ranger merits a new look. We believe that baseline knowledge of who principals tend to work with when performing different leadership functions is needed. There is growing

evidence that principals exercise leadership indirectly through influencing others and can only improve school outcomes indirectly (Dumay, Boonen, & Van Damme, 2013; Hallinger & Heck, 1996, 1998; Heck & Hallinger, 2009; Supovitz, Sirinides, & May, 2010). The research gap on principals' joint work with others is surprising given the emergence and popularity of distributed models of leadership that emphasize the work principals do with others. A distributed perspective on leadership involves at least two aspects. First, it acknowledges that the work of leadership involves others, not just the school principal. Second, it foregrounds the practice of leadership and frames that practice in terms of the interactions among leaders and followers. This particular framing posits that leadership is constituted in social interaction rather than solo activity. Hence, an update to the available evidence on how principals distribute their time working with others is long overdue. Not only is it important to understand what proportion of time principals spend working with different school personnel, it is also important to understand the sorts of activities they work on with others, and the nature of these interactions. Furthermore, it is important to examine if there are individual and organizational factors that might account for variation in how principals work with others. We take up these issues in this article using longitudinal EOD log data to provide estimates of the proportion of time principals spend working alone and working with others.

We also examine the importance of context in enabling and constraining principals' time allocation. Contingency theory suggests that the key task of organizations is establishing an "optimal match" between the organization's environmental conditions and its own response to those conditions (Hanson, 1979; Scott, 1992). Henry Mintzberg, whose ground-breaking work in time studies was reviewed above, also proposed that organizational performance stems from fit between an organization's external environmental conditions, internal structure, and the organization's strategy (Mintzberg, 1981). There is substantial evidence that contextual factors such as school level (elementary/secondary), location (urban/rural), school size, and student body characteristics influence leadership styles (e.g., instructional and transformational leadership) and leadership effectiveness (e.g., Hallinger, 2003; Hallinger & Heck, 1996; Hallinger & Murphy, 1986; Kruger, Witziers, & Slegers, 2007; Louis, Leithwood, Wahlstrom, & Anderson, 2010; ten Bruggencate, Luyten, Scheerens, & Slegers, 2012). We conjecture that an important detriment of principal effectiveness may be the fit between their allocation of time and the organizational conditions of their school. However, there is limited research on how school context influences principal time allocation on organizational functions and time spent with others. Adding time allocation information to the body of research on how context shapes leadership styles and effectiveness

will enhance the research base for a contingency based approach to studying school leadership.

The limited evidence on the influence of school context on principals' work is highly variable and sometimes contradictory (Goldring et al., 2008; Louis et al., 2010). A review of the literature examining the association between schools' socioeconomic conditions and principals' work illustrates these points. Goldring et al. (2008) compared the work of Lortie, Crow, and Prolman (1983) that showed principals in lower SES schools focused more on student affairs and personnel relationships, with research by Hallinger and Murphy (1986), which showed that such principals focused more on curriculum and instruction. Goldring et al. (2008) found that principals who distribute their efforts over multiple domains, as opposed to narrowly focusing on a few domains, tend to come from elementary schools and higher socioeconomic status schools. It is worth noting, as Louis et al. (2010) did, that there are very few quantitative studies within the small body of research examining the association between school contexts and principals' work. The research base on how school context influences principal practice and interacts with principals' individual attributes is thus still developing in our view.

To address the gaps in the literature just outlined, this study takes up three questions:

1. How do principals allocate their time by different functional domains and how does this allocation vary by time?
2. How do principals allocate their time between working alone and working with other school staff?
3. How does school context influence principals' time allocation across different functional domains and time periods, and their work with others?

Method

Data for this study come from an evaluation of an intensive, nationally scaled up executive training program for principals. Data were collected from 52 schools in a single urban district, 30 of which were elementary schools, 11 of which were middle schools, and 8 of which were high schools. The majority of students in the district were African American (65%), while 26% were White, 4% were Hispanic, and 2% were Asian. Sixty-two percent of the students in the district were eligible for free and reduced-price lunch (FRL). Sixty-seven percent of the principals in the district were female, 40% were Black, and 68% had at least 10 years of experience working as an

Table 1. Web Log Participation and Completion Rates.

	<i>N</i>	Response Rate
Spring 2005	49	93%
Fall 2005	42	78%
Winter 2006	43	80%
Spring 2006	38	70%
Fall 2006	43	80%
Winter 2007	42	80%
Spring 2007	35	67%

administrator. Principal staffing in the district was quite stable as 57% had worked for at least 5 years in their present schools at the time of the study.

The primary source of evidence on principal practice in this study is a closed-ended, web-based time diary called the EOD log. While time diaries are often nondirected and open-ended, and collect time allocation for a single day, the EOD log was a close-ended instrument that collected information for 15 days of a school year. Calendar data on time spent on leadership functions and the individuals with whom principals interacted were collected during 6 consecutive days in Spring 2005, and 5 school days apiece in Fall 2005, Winter 2006, Spring 2006, Fall 2006, Winter 2007, and Spring 2007. This mode of data collection allowed us to examine cyclical variations in principal practice across days, weeks, and seasons. Table 1 provides the number of principals who participated in the web log administrations and the response rates for each administration period. There was at least one EOD log entry from every school in the district across the seven waves of data collection. The average number of recordings from each school was 28 days and the maximum was 36. During the timeframe of the study, there was turnover in the principals in the district. As a result, a total 68 principals from the 52 schools provided EOD log data during the course of the study.

Over hourly intervals of an entire workday, principals logged the time they spent in nine functional domains: (a) building operations, (b) finances, (c) community or parent relations, (d) school district functions, (e) student affairs, (f) personnel issues, (g) planning and setting goals, (h) instructional leadership, and (i) professional growth. The definitions and theoretical underpinnings for these nine domains have been described elsewhere (Barnes, Camburn, Sanders, & Sebastian, 2010; Camburn et al., 2010). Figure 1 provides a snapshot of the calendar interface that principals used to record their activities. Four options were provided to principals for logging the amount of time they worked on a particular domain within a 1-hour block: 1 (1-14 minutes), 2 (15-29 minutes), 3 (30-44 minutes), and 4 (45 minutes to 1 hour). We

2. Please indicate when and for how long you worked on each of the following areas today. Within each hour block in which you worked on an area, indicate whether you worked on it for:

1 = 1-14 minutes; 2 = 15-29 minutes; 3 = 30-44 minutes; 4 = 45 minutes to 1 hour

	6-7 am	7-8 am	8-9 am	9-10 am	10-11 am	11-12 pm	12-1 pm	1-2 pm	2-3 pm	3-4 pm	4-5 pm	5-6 pm	6-7 pm	After 7pm
Building operations (schedules, space allocation, building maintenance, vendors)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finances and financial support for the school (preparing budgets, budget reports, seeking grants, managing contracts)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Community or parent relations (formal meetings and informal interactions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
School district functions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student affairs (attendance, discipline, counseling, hall/canteen monitoring)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personnel issues (recruiting, hiring, supervising, evaluating, problem solving)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Planning/setting goals (school improvement planning, developing goals)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Instructional leadership (monitoring or observing instruction, school restructuring or reform, supporting teachers' professional development, analyzing student data or student work, modeling instructional practices, teaching a class)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your professional growth (formal professional development, attending classes at college/university, reading articles or books)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please specify all others in time order below

Figure 1. Daily end of day log calendar.

converted the original ordinal scale values captured by the log instrument to the midpoint of these ranges: 7, 22, 37, and 52 minutes.

Once a principal logged any amount of time spent on a particular function, the interface redirected them to a question where they reported who they were working with on that particular function during a particular hour. In Spring 2005 and Fall 2005, the options included the following: (a) by myself, (b) regular classroom teachers, (c) teacher-leaders (coaches, facilitators, master/mentor teachers), (d) students, (e) other principals, (f) district staff, (g) university staff, (h) parents, (i) community members, (j) vendors/contractors, and (k) other. In subsequent data collection waves, the following categories were added: (a) other school staff, (b) mixed group meeting, and (c) large group gathering. Because the changes made to the questionnaire could influence the response patterns, we conducted all analyses examining principals' interactions with others with all waves included and again with the first two administrations removed. Because the results from these separate analyses were not substantively different, we only report the analysis conducted with all waves of survey data. We focused on eight categories of principals' time allocation distribution: working alone, regular classroom teachers, teacher leaders, students, other principals, district staff, parents, and community members.

Table 2 illustrates how the EOD data appear for one domain, Building Operations, for one principal on one day. The top row shows the number of minutes logged by the principal on building operations while the lower row shows who the principal was working with when they reported working on

Table 2. Illustration of One Principal’s Record of Time Spent and Presence of Other Staff When Working on Building Operations.

	6-7 a.m.	7-8 a.m.	8-9 a.m.	9-10 a.m.	10-11 a.m.	11-12 noon	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	6-7 p.m.	After 7 p.m.
Time	0	15-29	30-44	0	0	15-29	0	0	1-14	30-44	0	45-60	15-29	0
Individuals	—	Myself	Other	—	—	Myself	—	—	Myself	Regular teachers	—	Myself	—	-

building operations. The principal in this example worked on building operations during seven different hour blocks during the day spending between 1 and 14 minutes and 45 and 60 minutes during each block. If we use the mid-point conversion for each response, this principal worked close to 200 minutes on building operations that day, working alone in most instances. When this principal did report working on building operations, he or she reported an average of 28.43 minutes. There is only one *isolated* instance of working on building operations, from 11 to 12 noon where the principal did not report working on building operations in the preceding (10-11 a.m.) or subsequent (12-1 p.m.) time blocks. All other entries are part of *contiguous* time blocks of work on building operations.

Multilevel Models: Principal Interactions Models

We used hierarchical linear models (HLM) to examine principals’ time allocation patterns to account for the nested structure of the data. More specifically, the outcomes examined in these models are the percentages of time principals allocated to different leadership functions and the percentage of time principals spent interacting with different constituents while working.² For models examining *who* principals worked with during a workday, we used three-level HLM models with repeated observations (days) at Level 1, nested within semester or season at Level 2, which were nested within principals at Level 3. The multilevel models also estimated how the variance of any given outcome was partitioned across days, across seasons of a year, and across principals. We used the software HLM 7.00 (Raudenbush, Bryk, & Congdon, 2011) to conduct all multilevel analyses.³ The following equations describe the general form of the multilevel models we used:

Level 1: Days

$$Y_{ijk} = \pi_{0jk} + e_{ijk} \tag{1}$$

where Y_{ijk} is the percentage of time spent on a leadership function on day i in semester j by principal k . Separate models were estimated for each of eight individuals with whom principals might have interacted. The individuals included both school personnel (e.g., teachers and teacher leaders) and non-personnel (parents and community members). Throughout this article, we refer to this set of individuals with whom principals might have interacted as “individuals” or “constituents.” For example, the percentage of time principals spend alone was estimated as a function of the average time they spend in a particular semester (π_{0jk}). The variation from day to day for each outcome is captured in the random error term e_{ijk} .

Level 2: Semester/Season

$$\pi_{0,jk} = \beta_{00k} + r_{0,jk} \quad (2)$$

In Level 2, the percentage of time principals spent interacting with each type of individual, for each semester, is modeled as a function of their overall average across all semesters (β_{00k}). Variation in this outcome from semester to semester within a year is captured by the random error term r_{0jk} .

Level 3: Principal

$$\beta_{00k} = \gamma_{000} + u_{00k} \quad (3)$$

At Level 3, the percentage of time principals allocate working with each type of constituent is modeled as a function of the overall average estimate for all principals (γ_{000}) for working with that constituent category. The random error term u_{00k} captures the variation among principals on this outcome. We refer to these models as principal interaction models in the rest of the manuscript.

Multilevel Models: Activity Description Models

For models describing temporal cyclical variations in principal practice, we used four-level HLM models in order to also capture variation within a day—from hour to hour. In these models, Level 1 consists of repeated hour block observations, nested within days at Level 2, nested within semester/seasons at Level 3, and finally within principals at Level 4. We ran separate models for each leadership function with the outcome being the percentage of time principals spent in an hour block on a particular function. The model equations are provided below:

Level 1 (Hour Block):

$$Y_{ijkl} = \pi_{0,jkl} + \sum_{a=1}^A \pi_{ajkl} * (\mathbf{X}_{ijkl}) + e_{ijkl} \quad (4)$$

where \mathbf{X} is a vector of dummy variables representing time blocks—6 a.m. to 8 a.m., 10 a.m. to 12 p.m., 12 p.m. to 2 p.m., 2 p.m. to 4 p.m., and later than 4 p.m.; 8 a.m. to 10 a.m. was the left out category.

Level 2 (Day):

$$\pi_{0jkl} = \beta_{00kl} + \sum_{b=1}^B \beta_{0bkl} * (\mathbf{Y}_{jkl}) + r_{0jk}; \pi_{ajkl} = \beta_{a0kl} \quad (5)$$

where \mathbf{Y} is a vector of dummy variables indicating the day of week—Tuesday to Friday so that Monday was the left out category.

Level 3 (Semester/Season):

$$\beta_{00kl} = \gamma_{000l} + \sum_{c=1}^C \gamma_{00cl} * (\mathbf{Z}_{kl}) + u_{00kl}; \beta_{0bkl} = \gamma_{0b0l}; \beta_{a0kl} = \gamma_{a00l} \quad (6)$$

where \mathbf{Z} is a vector of dummy variables indicating semester/season—Fall and Spring, so that Winter was the left out category.

Level 4 (Principal):

$$\gamma_{000l} = \delta_{0000} + v_{000l}; \gamma_{00cl} = \delta_{00c0}; \gamma_{0b0l} = \delta_{0b00}; \gamma_{a00l} = \delta_{a000} \quad (7)$$

In these models, we also included dummy variables for year of observation in Level 3, to account for any year specific district-wide changes that might have occurred. Furthermore, all predictors were grand mean centered so that the intercept became the expected percentage of time a typical principal (averaged on all predictor variables) spent in an hour on a leadership function. We refer to these models as activity description models in the rest of the article.

To test whether model results were sensitive to different model specifications, we fit models with only hour-level predictors, only day-level predictors, only semester-level predictors, and with all sets of predictors. Because the results were consistent across all of these model specifications, we only present the results with the combined set of hour, day, and semester-level predictors. We also checked the robustness of our final model results by estimating simpler three-level HLM models with days nested within semester nested within principals. The main results of the three-level models were similar to those of our final models so we only present the results from four-level models, which have the advantage of illuminating within-day variation.

To examine the influence of school context on principals' time allocation, we modified the activity description models and principal interaction models to add school contextual variables as covariates at the principal level. During the course of the study, five principals switched schools within the district.

Since the school and principal levels are the same for our models, we removed these principals from analysis. We included four school-level contextual variables. School size was simply the number of student enrolled in the school. We divided this number by 100, so that the regression coefficients for this predictor captured the expected change in an outcome per 100 students. For the school level, we included a dummy variable for elementary schools; therefore, the models compared elementary schools with all other schools (middle, high, and alternative schools). The percentage of students on FRL was used as a proxy variable to capture student poverty. We also initially included a variable for student diversity with the percentage of White students in each school. However, as this was correlated with percent FRL at 0.90, we did not include this variable in the final models. All contextual variables were collected from the 2005-to-2006 school year.

The four-level HLM models we used to examine principals' work have not been widely used in the field, but we felt they were appropriate given the complex nested structure of the data. We attempted to get an overall sense of how well our models fit the complex data by examining model fit statistics. For models with similar nesting structures, we used deviance statistics to examine model fit. More specifically, we conducted chi-square tests of the differences between the deviance statistics of final models and null models. These tests showed that for all activity domains our final models fit the data significantly better than models with no covariates (see the Appendix).

Results

We organize our reporting of results around five key findings related to how principals allocated their time. First, the amount of time that principals spent on their work is consistent with estimates reported in past research; they also worked on diverse tasks during their workday. Second, unlike prior work, we find little evidence that the work life of principals in our study was characterized by brief, constantly changing tasks. Third, our analysis shows how variation in principal practice by time is domain dependent. Fourth, principals in our study spent most of their time working with within-building colleagues rather than working alone. Furthermore, principals are largely similar in terms of time spent working with others; between-principal differences were evident only when it came to their work on their own and their work with students. Last, except for school level, school context does not seem to be a key factor in differentiating how principals allocate their time across functional domains and how they distribute time working with others.

We organize these main findings into two subsections below: We first report on the length of the principals' workday, how principals allocated time within

Table 3. Descriptive Statistics of Principals' Time Allotment from End of Day Calendar Data.

	<i>M</i>	<i>SD</i>
Total minutes worked in a day	443.76	150.19
Number of different domains covered/ day	4.94	1.91
Minutes logged in each time block (8 a.m.-5 p.m.)	44.24	13.04
Percentage of total time logged on		
Building operations	8.44	12.19
Finances	4.39	7.74
Community/parent relations	9.83	11.93
District functions	7.20	16.21
Student affairs	21.48	18.82
Personnel issues	10.33	14.03
Planning/setting goals	9.22	13.97
Instructional leadership	16.25	18.55
Professional growth	5.18	15.11
Other	7.67	16.04

their workday, and examine variation in principal practice by hour, day, and season. We then consider whether principals worked alone or with others.

Principals' Allocation of Time to Different Leadership Functions

Principals reported an average of 7.4 hours of work activity per day on the daily logs. The standard deviation of 2.5 hours indicates that principals differed substantially in the total duration of work activities they reported (see Table 3). The average length of time principals reported working on a leadership function within a given hour block was 45 minutes. Principals reported working on nearly five leadership functions each day. This meant that on a typical day, principals engaged in half of the leadership functions in our comprehensive set of functions. Note that these estimates of daily time allocation were averages across seven log reports collected between Spring 2005 and Spring 2007.

Estimates shown in Table 4 indicate the average time per hour principals spent on each leadership function.⁴ Indeed, principals reported spending close to 40 minutes per hour on instructional leadership and planning/setting goals when they worked on those domains. Principals reported devoting considerably less time to building operations, working on that function for an average of 30 minutes per hour.

Table 4. Average Time Spent on Reported Instances and Proportion of Isolated Time Blocks.

	Average Time Reported		Proportion of Isolated Time Blocks
	M	SD	
Building operations	29.65	16.23	0.74
Finances	32.08	16.66	0.82
Community/parent relations	38.67	12.14	0.67
District functions	38.85	15.34	0.46
Student affairs	37.45	13.65	0.48
Personnel issues	34.75	14.97	0.66
Planning/setting goals	38.05	14.39	0.60
Instructional leadership	40.15	13.63	0.44
Professional growth	39.48	15.37	0.64
Other	39.71	12.81	0.56

Table 4 also shows the proportion of isolated time blocks for each leadership function. An isolated time block refers to a block of time that is not preceded by nor followed by an entry for that particular function. Leadership functions varied in the degree to which their performance was “isolated” within the school day. On average, three quarters of principals’ reports of building operations were in isolated time blocks with the remaining 25% falling into contiguous hour blocks. Most reports of work on finances and building operations were in isolated hour blocks and were not preceded by nor followed by work in those specific domains. In contrast, more than half of the reported instances of instructional leadership activity, student affairs, and district functions overlapped multiple contiguous time blocks. This should not be interpreted as meaning that there was no interruption in work in a domain during the contiguous time blocks. A principal could report working on a particular domain for the first part of an hour block and the last section of the subsequent hour block, while working on other domains in between; our analysis would still report this activity as falling into contiguous blocks.

Table 5 illustrates how much of the variation in principals’ allocation of time to nine leadership functions (the category “Other” was excluded) is between hours, between days, across semesters, and between principals. The far left column of Table 5 also presents the intercepts (weighted averages of principals’ time allotment to particular leadership functions), and we can see that they closely match the unweighted means reported in Table 3. The estimates presented in Table 5 are from models with no predictors at any level.

Looking at the variance decomposition estimates, it is evident that the vast majority of the variation in principals’ reports is between hours of the day. In

Table 5. Hierarchical Linear Models Estimates (Time Percentage) and Variance Estimates of Time Spent on Functional Domains.

	Estimate	Standard Error	Variance Estimates			
			Level 1 (Hour)	Level 2 (Day)	Level 3 (Semester)	Level 4 (Principal)
Building operations	9.04	0.77	631.39	22.77	7.81	30.80
Finances	4.74	0.40	330.44	7.89	4.69	6.61
Community/parent relations	10.15	0.55	695.58	43.76	3.79	3.35
District functions	6.99	0.63	402.15	173.69	2.67	12.54
Student affairs	21.28	1.22	1260.51	83.56	17.66	77.73
Personnel issues	10.13	0.65	696.50	47.17	33.18	11.88
Planning/setting goals	8.95	0.61	635.72	85.41	11.99	11.93
Instructional leadership	16.42	1.04	1017.58	124.96	26.53	48.78
Professional growth	5.06	0.49	272.40	181.37	4.49	3.71

other words, the amount of time principals spent on each leadership function varied substantially from one hour to the next. Reports across days, semesters and from one principal to the next were much less variable in comparison. The patterns of variation were quite different for each leadership function. Day-to-day variation was highest for school district functions, instructional leadership, and professional growth. Seasonal variations (between semesters) were highest for personnel decisions, whereas principal-to-principal differences were highest for building operations, student affairs, and instructional leadership.

The next step of our analysis was to use predictive HLM models to help explain the variation in principals' time allocation. The results presented in Tables 6, 7, and 8 are from a common set of predictive models. Because the model results are voluminous, we felt that presenting the results in separate tables would facilitate readability. Table 6 shows the results from Level 3 of the model, which focused on semester/season. These results reveal that principals spent a greater percentage of their time in school district functions in fall and spring. However, they also spent a lower percentage of their time on community/parents related issues and instructional leadership in the spring. These patterns suggest that principals allocated a greater portion of their time to district affairs in spring by reducing the proportion of time spent working with community/parents and in instructional leadership. The lack of seasonal

Table 6. Variation by Semester/Season of Principals' Time Allocation on Functional Domains.

	Intercept		Difference in Fall		Difference in Spring	
	Estimate	SE	Estimate	SE	Estimate	SE
Building operations	9.03***	0.78	0.84	0.99	0.92	0.85
Finances	4.69***	0.41	-0.06	0.67	-0.60	0.57
Community/parent relations	10.20***	0.55	-0.66	1.00	-1.72*	0.86
District functions	7.22***	0.61	4.63***	1.24	4.69***	1.07
Student affairs	21.12***	1.19	-1.03	1.46	1.66	1.24
Personnel issues	10.07***	0.65	-1.40	1.39	1.81	1.20
Planning/setting goals	9.09***	0.61	1.03	1.23	0.36	1.06
Instructional leadership	16.19***	1.08	-2.30	1.56	-5.48***	1.33
Professional growth	5.11***	0.49	1.45	1.27	-0.92	1.10

Note. All predictors were grand mean centered. Winter was the left out category.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

variation in other functional domains (i.e., building operations, finances, student affairs, personnel issues, planning, and professional growth) suggests a relatively constant emphasis on those domains throughout the year.

As shown in Table 7, the day of the week (Monday to Friday) does not strongly predict differences in how principals allocate their time for most functions. Principals allocated a greater portion of their time to their own professional growth toward the end of the week. They were also less likely to engage in district functions, community/parent relations and instructional leadership toward the end of the week. Besides these differences, principal allocation of work in various functional domains did not appear to depend on the day of the week.

The results of the four-level HLM analyses examining variation in principals' time allocation across a typical day are summarized in Table 8. We note that of all the predictors examined in the four-level HLM models, hour of day is the strongest predictor of principals' temporal variation in time allocation. As shown in Table 8, the percentage of time principals spent on building operations was highest from 6 a.m. to 8 a.m. (~33%), after which the time spent on that domain dropped and stayed at low levels (around 5%) for the rest of the day. The percentage of time allotted to instructional leadership, student affairs, and personnel decisions displayed an inverted U pattern with less time spent on these functions early in the day, reaching a peak around midday and then

Table 7. Variation by Day of Week.

	Intercept		Tuesday		Wednesday		Thursday		Friday	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Building operations	9.03***	0.78	-1.82*	0.79	-0.80	0.84	-0.85	0.83	-0.34	0.86
Finances	4.69***	0.41	-0.35	0.55	-0.98	0.58	-0.88	0.58	-0.66	0.60
Community/parent relations	10.20***	0.55	1.11	0.90	1.09	0.94	1.19	0.94	-2.15*	0.97
District functions	7.22***	0.61	1.31	1.21	1.22	1.26	0.27	1.26	-2.82*	1.30
Student affairs	21.12***	1.19	-0.75	1.24	2.56	1.30	0.62	1.30	-0.57	1.34
Personnel issues	10.07***	0.65	0.96	0.93	-0.48	0.98	-0.61	0.98	-1.00	1.01
Planning/setting goals	9.09***	0.61	-0.70	1.03	-2.01	1.09	-2.90*	1.09	2.11	1.12
Instructional leadership	16.19***	1.08	1.49	1.28	-1.47	1.35	-1.37	1.34	-3.65**	1.38
Professional growth	5.11***	0.49	0.86	1.21	0.27	1.26	2.90*	1.27	3.84**	1.30

Note. All predictors were grand mean centered. Monday was the left out category.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 8. Variation by Hour of Day.

	Intercept		6 a.m.-8 a.m.		10 a.m.-12 p.m.		12 p.m.-2 p.m.		2 p.m.-4 p.m.		After 4 p.m.	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Building operations	9.03***	0.78	24.83***	0.85	-3.74***	0.67	-3.59***	0.67	-1.70*	0.68	0.39	0.79
Finances	4.69***	0.41	0.20	0.65	-0.40	0.51	0.07	0.52	0.15	0.52	1.30*	0.60
Community/parent relations	10.20***	0.55	-2.93**	0.94	-3.46***	0.74	-2.89***	0.75	-1.70*	0.75	4.04***	0.87
District functions	7.22***	0.61	-2.94***	0.72	1.32*	0.56	-3.21***	0.57	-3.30***	0.57	-1.78**	0.67
Student affairs	21.12***	1.19	-9.30***	1.26	-1.50	0.99	-2.36*	1.00	0.49	1.01	-16.42***	1.17
Personnel issues	10.07***	0.65	-1.60	0.95	1.50*	0.74	3.15***	0.75	1.97*	0.76	0.39	0.88
Planning/setting goals	9.09***	0.61	1.78*	0.91	0.19	0.71	1.66*	0.72	2.59***	0.72	4.14***	0.84
Instructional leadership	16.19***	1.08	-14.80***	1.12	5.72***	0.88	4.48***	0.89	-0.81	0.89	-10.46***	1.04
Professional growth	5.11***	0.49	-1.19*	0.59	-0.48	0.46	-0.73	0.47	0.15	0.47	6.06***	0.55

Note. All predictors were grand mean centered. The left out category was 8 a.m. to 10 a.m.

* $p < .05$. ** $p < .01$. *** $p < .001$.

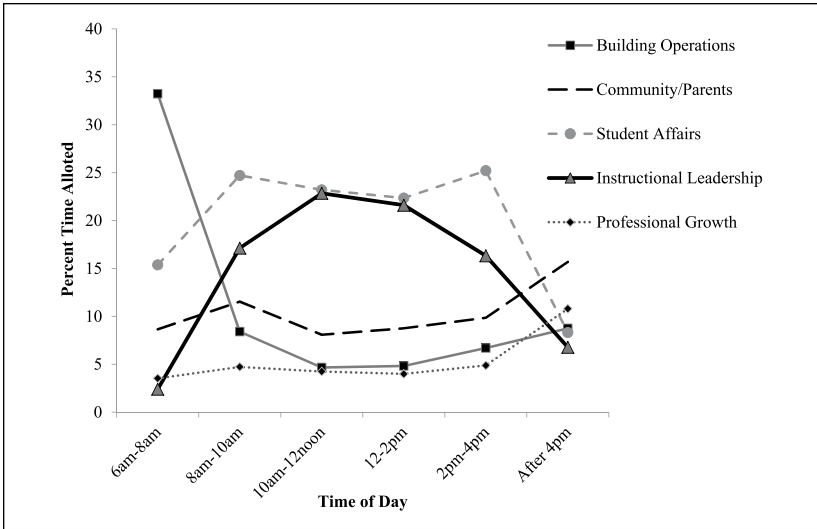


Figure 2. Principals' daily time allocation patterns.

dropping off again. The percent of time allotted to personal professional growth, finances, and parent/community ties was low throughout the day and increased slightly toward the end of the day. Finally, the percentage of time allotted to community/parent relations and planning/setting goals fluctuated throughout the day with a slight increase at the end of the day. The hour-to-hour variation in principals' time allocation based on the results from the activity description models is also shown in Figure 2, which plots the simple averages of principal time allocation percentages by hour and leadership domain.

Principal Practice: Time Working Solo and With Others

The next set of analyses examined how principals allocated their time working alone versus working with others (Table 9). On average, across the multiple log administrations spanning 3 school years, principals reported spending only 23% of their working day alone. Still, there was considerable variation between principals on whether they worked alone or with others. Principals who were one standard deviation above the mean spent almost 40% of their day working alone, and principals who were one standard deviation below the mean reported less than 10% of their day working alone. With respect to whom principals reported working with, classroom teachers, followed by teacher leaders, and then students were the most frequent work partners. Principals reported spending little time working with other school

Table 9. Unconditional Models Predicting Percentage of Time Principals Spend Working With Different Individuals.

	Hierarchical Linear Modeling Results						
	M	SD	Estimate	SE	Variance Estimates		
					Level 1 (Day)	Level 2 (Semester/ Season)	Level 3 (Principal)
Self	23.21	14.65	22.60	1.45	276.79	63.93	102.77
Regular teacher	15.24	8.73	15.61	1.04	283.22	43.96	41.20
Teacher leader	10.43	7.58	10.44	0.86	196.18	39.55	26.15
Students	10.39	10.64	10.49	1.26	168.27	41.29	82.02
Other principals	5.18	5.15	4.96	0.54	168.53	0.45	9.59
District staff	5.54	4.54	6.06	0.53	216.59	0.23	6.31
Parents	5.16	3.80	5.04	0.41	67.18	6.86	5.53
Community members	1.43	2.47	1.49	0.29	24.29	0.00	3.92

principals, district staff, or parents (around 5%), and almost no time working with community members.

Table 9 also decomposes variation in how much time principals spent working with others, breaking the variation between days, between semesters/seasons (within principals), and between principals. For most of the different constituents with whom principals interacted, much of the variation in principals’ interactions lay between days (Level 1). The social settings for which principals differed the most were working by themselves and working with students. Approximately 25% of the variation in principals’ work in these two social settings fell between principals. For all other constituent groups, the time principals spent interacting with individuals in those groups did not vary tremendously across principals or by semester. Nearly all of the variation in principals’ interaction with constituents with whom principals spent the least amount of time (other principals, district staff, parents, and community members) was day-to-day variation (close to 90%).

Principal Practice: The Importance of Context

To examine the importance of context on principals’ workdays, we added school contextual covariates to the principal level to the principal interaction and activity description models. Table 10 shows the results of four-level HLM models predicting principals’ allocation of time across different

Table 10. Variation of Principals' Time by Context.

	Intercept		Average Achievement		Percent FRL		Elementary School		Size	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Building operations	8.49***	1.84	1.52	1.84	-0.10	1.60	1.98	2.85	0.71	1.13
Finances	6.26***	0.96	2.04*	0.95	0.67	0.82	-2.16	1.52	0.86	0.62
Community/parent relations	12.12***	1.29	2.58*	1.27	1.23	1.10	-1.19	2.05	1.15	0.84
District functions	6.95***	1.57	-0.28	1.54	-0.99	1.34	0.27	2.49	1.00	1.02
Student affairs	20.34***	2.40	-0.24	2.40	0.25	2.08	0.50	3.74	1.29	1.49
Personnel issues	11.24***	1.69	1.41	1.66	1.01	1.45	0.28	2.70	0.02	1.12
Planning/setting goals	9.53***	1.38	0.83	1.36	1.14	1.18	-1.41	2.21	-0.54	0.91
Instructional leadership	15.45***	2.48	-5.32*	2.48	-0.74	2.15	-1.97	3.85	-1.73	1.54
Professional growth	4.73***	1.30	0.42	1.26	-0.06	1.10	0.25	2.10	-0.05	0.88

Note. FRL = free and reduced-price lunch.

* $p < .05$. ** $p < .01$. *** $p < .001$.

functional domains. Among the school-level covariates added to the model, schools' average achievement level was the only variable that was significantly associated with the proportion of time principals allocated to activities. Principals in schools with higher average achievement allocated a greater proportion of their time working on finances and community/parents and a lower proportion of their time on instructional leadership in comparison with other principals. Table 11 describes the relationship of school contextual variables with principals' work by themselves and with other individuals. We found that the likelihood of principals working by themselves and working with regular teachers was significantly associated with school context factors. Specifically, principals in elementary schools and in larger schools spent a greater proportion of their workday working by themselves. In addition, principals in schools where average achievement was higher, schools with a greater percentage of students on FRL, and larger schools spent less time working with regular teachers, although the differences were quite small, less than 1%.

The results shown earlier in the activity description models suggest that principals' time allotment did not vary much by semester/season or day of the week. However, the estimates presented thus far are averages across all schools in the sample. There may be important differences from school to school around these average estimates. For example, while on average, principals' time allotments do not vary from winter to fall on most functions, there may be variation around the mean, such that some principals do differ in how they allocate their time in fall compared with other principals, even though the average shows no differences. Using cross-level interactions in the activity description models, we can explore if the influence of school context factors on principals' time allocation varies by hour of day, day of the week, and season/semester. In these models, every predictor at the hour, day, and semester levels of the activity description models can be allowed to vary (or be random) at the principal level. Furthermore, if sufficient random variation is observed, it can be predicted by school-level contextual variables. The results of these models are too numerous to include here and are available on request from the authors. The significant results from these interaction models are presented in Table 12.

Overall, school context factors tend to predict mostly hour-to-hour variation in principal practice. Day of week is important for only one predictor—whether planning occurred on a Friday. Principals in schools with higher average achievement spent about 7% more time than other principals on planning activities on Fridays. Otherwise, school context factors generally did not predict variation in principals' time allotment by day of week, or semester/season. In predicting hour-to-hour variation within a day, the most

Table 11. Variation in Principals' Work With Different Individuals by School Characteristics.

	Intercept		Average Achievement		Percent FRL		Elementary School		School Enrolment (Size)	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Self	23.39***	1.44	-0.22	0.32	-0.17	0.13	13.09**	4.75	1.30*	0.61
Regular teacher	15.63***	0.94	-0.65**	0.21	-0.23**	0.08	5.81	3.11	-0.83*	0.41
Teacher leader	9.86***	0.78	0.02	0.17	0.10	0.10	-3.59	2.58	-0.49	-0.49
Students	8.90***	0.92	-0.08	0.20	-0.04	0.08	-1.41	3.03	-0.51	0.39
Other principals	5.01***	0.54	0.01	0.12	0.02	0.05	-1.55	1.80	0.29	0.24
District staff	6.01***	0.54	0.11	0.11	0.04	0.05	-1.54	1.82	-0.03	0.25
Parents	5.00***	0.41	0.13	0.09	0.06	0.04	-1.32	1.39	-0.04	0.19
Community members	1.59***	0.31	0.08	0.07	0.03	0.03	-2.02	1.02	0.07	0.13

Note. FRL = free and reduced-price lunch.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 12. Interaction of School Contextual Variables With Time-Varying Predictors of Principals’ Time Allotment.

Outcome	Predictor Level	Predictor	Contextual Variable	Estimate	SE	
Building operations	Hour	6 a.m.-8 a.m.	School Size	8.62*	3.77	
	Hour	2 p.m.-4 p.m.	Elementary	-9.37**	3.25	
	Hour	After 4 p.m.	Percent FRL	5.20*	2.57	
	Hour	After 4 p.m.	Elementary	-13.48**	4.94	
Finances	Hour	2 p.m.-4 p.m.	School size	2.72*	1.23	
	Hour	6 a.m.-8 a.m.	Elementary	-11.10*	4.94	
Community/parents	Hour	10 a.m.-12 p.m.	Achievement	4.93*	2.39	
	Hour	10 a.m.-12 p.m.	School size	3.38*	1.72	
Personnel	Hour	12 p.m.-2 p.m.	Achievement	5.74*	2.29	
	Hour	12 p.m.-2 p.m.,	Percent FRL	4.58*	2.00	
	Planning	Day	Friday	Achievement	6.94*	3.08
		Hour	After 4 p.m.	Percent FRL	-5.58*	2.39
Instructional leadership	Hour	10 a.m.-12 p.m.	Elementary	4.93**	2.39	
	Hour	12 p.m.-2 p.m.	Elementary	3.38*	1.72	
	Hour	2 p.m.-4 p.m.	Elementary	5.74**	2.29	
	Hour	After 4 p.m.	Elementary	4.58*	2.00	

Note. FRL = free and reduced-price lunch.

* $p < .05$. ** $p < .01$. *** $p < .001$.

noticeable pattern is in instructional leadership in relation to differences in level (elementary schools compared with other schools). Table 12 shows that from 10 a.m. onward, principals in elementary schools spent more time on instructional leadership than principals from other schools. Principals in elementary schools also spent less time after 2 p.m. on Building operations and less time on Community/Parent relations from 6 a.m. to 8 a.m. (in comparison with other schools). Principals in schools with higher enrollments also spent a greater proportion of their time on Building operations early in the day (6 a.m.-8 a.m.) when compared with other principals. Only statistically significant differences are shown in Table 12. However, we note that many of these differences can be considered small, as their magnitude is about 5% or less. If we consider a 10% change to be practically significant variation in principal practice, then only the school level (elementary school vs. other schools) appears to be an important contextual variable that influences principals’ daily practice patterns. Besides these differences, there was little predictable temporal variation by context in principal practice.

Discussion and Conclusion

Our article paints a detailed portrait of how principals in an urban school district allocated their time among different leadership function domains and the extent to which principals worked with others as distinct from working solo. These results make three main contributions: First, we documented temporal variation in principals' time allocation on central school functions by time of day, day of the week, and season. Second, we estimated the proportion of time principals spend working by themselves versus working with other individuals including teachers, teacher leaders, students, other school principals, district staff, parents, and community members for nine key leadership functions. To our knowledge, this is the first study to systematically document such variation in principal practice by time and social context across a relatively large sample that comprised of all principals in an urban school district. Third, we examined the influence of school context factors on principal time allocation and their interaction with others in the course of their work. Much of the evidence of principals' time allocation is based on case studies and observations of a few principals. Our work extends the growing evidence base with evidence collected from a relatively large sample over a 3-year period.

We found support for some popular notions about principal practice from earlier research but limited support for others. To begin, school principals in our study worked many hours and on many different tasks in a single day. Principals recorded an average of 444 minutes of activity a day. Furthermore, principals in our study worked an average of at least 50 hours a week,⁵ similar to estimates reported in the early studies of principal practice (Kmetz & Willower, 1982; Martin & Willower, 1981). This is interesting considering the dramatic shifts in the education sector in the United States over the past quarter century with the introduction of standards and accompanying assessments that hold schools and principals in particular accountable for student achievement. One might expect that these shifts would have contributed to even longer workdays for school principals. The EOD instrument could be under estimating the total time worked by principals. We also found that principals worked on an average of five different domains in a single workday covering over half of the domains in our comprehensive framework of principal leadership. Like other studies, we thus find that a distinctive requirement of principals' work is that they must regularly spread their attention across a broad array of responsibilities.

Our analysis suggests that principals' work tasks are perhaps *not* characterized by brevity and constant interruption as suggested by some prior work. Rather, on average, principals reported sustained attention of a half hour or

more on all leadership functional domains when they reported any time working on that activity. Even more striking, when work on instructional leadership was reported, principals said they spent about 40 minutes on that function. Our finding that for all domains except instructional leadership, the majority of log entries were in isolated blocks might suggest a fragmented workday. However, our finding that when principals engaged in a leadership function they spent an average of 30 minutes on that function tempers an interpretation of brevity and fragmentation that might be suggested by the “isolated” hourly block results. We note that our results align with the findings reported by Spillane and Hunt (2010) who used experience-sampling methods and found that principals spent an average of half an hour on each domain. Overall, our analysis points to a higher degree of continuity in principals’ work activities than portrayed in popular conceptions of school leadership work, and the image of brief and continuously interrupted work may not be as applicable today.

Our study contributes to the literature by focusing on within-principal variation and examining how principals’ activities changed over time. We found that season or semester is not a significant predictor of variation in most leadership domains. For the most part, the day of the week does not predict variation in principals’ time allocation patterns. In terms of hour-by-hour variation in principals’ time allocation, many of the observed patterns show that they are a function of when students and school personnel are in the building. Principals tend to work on building operations, for example, mostly before students arrive in the morning. Student affairs and instructional leadership occupy most of a principal’s time from 8 a.m. to 4 p.m. and, as one might expect, are not particularly frequent before and after those hours. Other activities also seem to be structured around these hours. Principals’ own professional growth seems to be generally put off until the end of the day. Parental and community relationships occur most frequently when students arrive in the morning and after 4 p.m., when students leave. Furthermore, meet and greet functions that most principals engage in, as their students arrive and leave school, likely contribute to these patterns. Interestingly, planning constitutes a steady but low proportion of principals’ activities throughout the day.

With regard to whether principals work alone or with other individuals, our study found that principals spend on average about 23% of their time working alone, similar to Wolcott’s (1973) account based on his study of a single principal nearly four decades earlier. Our analysis suggests that others figure prominently in the school principals’ workday. Consistent with prior work, our analysis suggests that the bulk of the school principals’ interactions are internally focused with individuals inside the schoolhouse. Principals

spent close to 60% of their time either working alone or with teachers and students from their buildings. Principals spent very little time interacting with other principals, parents, district staff, and community members. These time allocation estimates for the principal working with other individuals are the first of their kind using large samples, in providing us with a glimpse of who principals collaborate with in their daily work on different domains. We also found that much of the variation in how principals allocate their time differentially among self and other individuals is from day to day and that there is not much variation from one semester to the next. With the exception of working alone and working with students, where between-principal differences in time allocation constituted 23% and 28% of the overall variation respectively, between principal differences were small.

We found that school context explained relatively little of principals' overall time allocation patterns and their working with others. Elementary school principals appear to spend a higher proportion of time working by themselves and also spend a greater portion of their time on instructional leadership from 10 a.m. until the end of the day. In summary, hour of day is the strongest predictor of temporal variation in principal allocation of time on various domains: Day of week, semester, and school context are weak predictors. Much of the variation in principals' practice occurs within a day, from hour to hour, and is influenced by when students and staff are in the building. On average, a principals' workday looks like Figure 2. Although there is considerable variation around this average profile, the available predictors did not systematically account for this variation, suggesting that there is considerable nonsystematic diversity to principals' daily work.

More complicated cross-level interaction models can examine if the pattern shown in Figure 2 varies by day and season and if that variation in turn is related to school context. However, exploring these patterns further is beyond the scope of this article. We showed earlier that even within a day, there seems to be a fair degree of continuity in tasks. Stepping back and viewing principal practice across days, weeks, seasons, and contexts, we get a different picture from that shown in prior school research. While the greatest diversity in principal practice is within a day, there is a pattern underlying this diversity that is influenced by when students and staff are in the building.

Differences in images of principal practice that have emerged from different studies likely reflect differences in the methods utilized in each study. Shadowing and observational methods get in-depth information for a short span of time thereby magnifying differences. In contrast, EOD methods capture data over longer periods of time, and tend to smooth out differences by collecting more data over time. However brief, varied, frenzied, and chaotic principals' work appears to an external observer who is likely observing that

principal for a short period of time, there appears to be an underlying pattern to this activity, at least in the principals' mind. It could be that principals think of their own work as organized around broad themes and constraints related to who is in the building at different times of the day, and this preconception affects both their actual work and their reporting of it.

Our results also raise questions of perspective and how perspective interacts with the chosen data collection strategy in determining whether activities are brief and/or interrupted. While the EOD estimates were based on principals' own reports, the early studies were based on shadowing or observational data collected by researchers. Based on the EOD data, a fair degree of continuity in time allocation across broad functional domains characterizes the principal's workday. It is possible that to an external observer, a principal may be moving rapidly from one activity to the next, but from the principal's perspective these different activities may be part of the same larger domain. Another possibility is that principals encounter many interruptions but they tend to deal with it as minor disruptions during work on a larger functional domain. As mentioned earlier, principals might also be more likely to remember activities that spanned greater durations and overlapped more than a single time block, while they might also forget rare events. All measurement strategies have limitations and the EOD log is no exception. Prior work has reported that estimates of principal activity recorded by EOD instruments were comparable with observation data gathered by observers, and similar to estimates from ESM data logs that required principals to record their activity at random intervals in their natural work settings (Camburn et al., 2010).

There are a few limitations to this study, one of which is the absence of information on where encounters took place when principals were interacting with other individuals during the course of their work. Wolcott (1973) catalogued principals' location in detail, recording whether particular encounters took place in the principal's office, in the classroom, hallway, and so on. This information was not available for the current study. Furthermore, while this work adds to the empirical base for understanding distributed leadership, the focus is still primarily on the principal. Principals could report working with teachers and other individuals but the nature of this work could still reflect traditional patterns of hierarchy/authority and may minimize informal influence networks in schools and important leadership work that does not involve principals. We also did not collect time allocation data from assistant principals, department chairs, nor teacher leaders. Another limitation is that we did not examine the influence of principals' own background toward time allocation patterns and their work distribution with others. Goldring et al. (2008) found that no individual attributes predicted whether principals adopted an eclectic approach by distributing work over several domains or a focused

approach prioritizing a few important domains. Future studies might explore the importance of principal attributes, such as personality traits or career stage, for time allocation on specific domains as well as the distribution of work with others. Finally, our findings are not generalizable beyond the principals in the urban school district in our study.

Our time allotment estimates are not strictly comparable with the earlier studies of principals' workdays as we studied broad domains of practice whereas they examined more narrowly defined 'activities'. Many different kinds of activities can and do place within our leadership function categories. For example, instructional leadership can include many activities that directly or indirectly support strong classroom instruction. Furthermore, some activities may overlap multiple domains such as when a principal observes a teacher in instructional practice. Principals are most likely to categorize this under Instructional leadership due to the prompts provided under that domain (*monitoring or observing instruction, school restructuring or reform, supporting teachers' professional development, analyzing student data or student work, modeling instructional practices, teaching a class*). However, it is possible that principals might have also recorded this under Personnel issues, especially if the observation informs the principals' decisions related to teacher evaluation. While the log did allow principals to record work on multiple leadership functions per hour, it did not capture fine-grained data that allowed us to understand how discrete leadership activities accomplished multiple leadership functions.

Despite these limitations, the findings of this study could be useful for leadership development and school reform initiatives. The lack of contextual and temporal variation (other than hour-to-hour) in principals' time allotment patterns and the consistency of the daily workflow pattern could be a useful framework to employ when designing principal professional development programs or school reform initiatives. Reforms can work to create deliberate change in these patterns to study their effects, for example, moving planning/setting goals to earlier in the day and earlier in the week. The other option is to take the daily workday pattern as a given, as a general set of limits on principals' workdays. We think it is quite likely that some of these patterns have evolved over decades or even centuries, in many cases perhaps for good reason. Given such longevity, broad patterns in how principals spend their time might be difficult to change. With recent policy changes that require principal to spend more time in classrooms observing instruction, it would be interesting to examine principal practice profiles with more recent data to examine if there have been significant changes. The data for this study is from 2005 to 2007 and would not capture those shifts in practice.

In conclusion, we believe the portrait of principals’ work reported here expands and enriches the field’s current understanding of how principals allocate their time across the multiple domains of responsibility that require their attention. We believe this portrait is timely as much of the research on which the field’s understanding of principals’ work has significant limitations (e.g., very small samples, in some cases, single principals), and does not reflect changing conceptions of principal leadership that have emerged in the past two decades (e.g., conceptions of shared or distributed leadership), nor changing conditions in the education system that impinge on the work of principals (e.g., standards-based accountability, emphasis on testing). While the portrait of principals’ work provided by this study addresses some of the limitations of prior research, there is still much we do not know. We have attempted to lay groundwork here on which future studies can build and provide more detailed and informative portraits of principal work practice.

Appendix

Descriptive Statistics of Principals’ Time Allotment from End of Day Calendar Data.

	Using Lower End of Range		Using Midpoint		Using Higher End	
	M	SD	M	SD	M	SD
Total hours worked in a day	360.53	124.92	443.76	150.19	534.74	189.95
Different domains covered/day	4.94	1.91	4.94	1.91	4.94	1.91
Minutes logged/block (8 a.m.-5 p.m.)	36.05	11.40	44.24	13.04	53.20	15.82
Percentage of total time logged on						
Building operations	8.05	12.60	8.44	12.19	8.69	12.05
Finances	4.24	7.97	4.39	7.74	4.47	7.65
Community/parent relations	9.64	12.39	9.83	11.93	9.94	11.73
District functions	7.31	16.63	7.20	16.21	7.14	16.02
Student affairs	21.53	19.52	21.48	18.82	21.45	18.50
Personnel issues	10.31	14.73	10.33	14.03	10.34	13.67
Planning/setting goals	9.33	14.46	9.22	13.97	9.16	13.77
Instructional leadership	16.55	19.29	16.25	18.55	16.06	18.19
Professional growth	5.31	15.49	5.18	15.11	5.12	14.93
Other	7.75	16.33	7.67	16.04	7.63	15.89

Average Time Spent in an Hour Block for Reported Instances of Work.

	Using Lower End		Using Midpoint		Using Higher End	
	M	SD	M	SD	M	SD
Building operations	22.90	15.93	29.65	16.23	36.95	16.59
Finances	25.28	16.39	32.08	16.66	39.43	17.06
Community/parent relations	31.67	12.14	38.67	12.14	41.58	15.66
District functions	31.98	15.11	38.85	15.34	46.42	15.74
Student affairs	30.56	13.47	37.45	13.65	44.93	14.02
Personnel issues	27.90	14.76	34.75	14.97	42.16	15.36
Planning/setting goals	31.15	14.22	38.05	14.39	45.56	14.79
Instructional leadership	33.23	13.46	40.15	13.63	47.72	14.02
Professional growth	32.60	15.15	39.48	15.37	47.05	15.78
Other	32.77	12.70	39.71	12.81	47.23	13.20

Model Fit Comparison Using Difference in Deviance Test.

	Final Model Comparison With Null Model Without Predictors		
	χ^2 Statistic	Degrees of Freedom	<i>p</i>
Building operations	26351.27	17	<.001
Finances	23580.40	17	<.001
Community/parent relations	25529.17	17	<.001
District functions	24143.52	17	<.001
Student affairs	27767.34	17	<.001
Personnel issues	25192.89	17	<.001
Planning/setting goals	25938.27	17	<.001
Instructional leadership	26999.05	17	<.001
Professional growth	158.24	17	<.001

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Notes

1. In ESM designs, respondents are prompted at random intervals during their workday through a pager or a smart device to respond to a brief set of questions about the activity that they are currently engaged in (see Camburn et al., 2010). The design reduces bias due to memory recall and has the advantage of gathering data in the respondents' natural settings.
2. The EOD instrument may not be accurate in capturing information on absolute time worked because it may be difficult for a principal to account for every activity and every minute of their workday. For this reason, EOD instruments often work with proportions of time logged and make the assumption that missing entries are random and do not bias the findings.
3. Assumptions associated with our analytic models include the following: (a) residual variances are normally distributed; (b) residuals between levels are independent of each other; (c) Level 1 residual variance is constant; (d) observations at the principal level are independent; (e) the relationships between predictors and outcome variables is linear; and (f) predictors at each level are independent of the residuals at the corresponding level (see Raudenbush & Bryk, 2002). We checked the degree to which model assumptions were met at multiple stages of analysis, including inspection of the data prior to analysis, and inspection of descriptive statistics and data displays at multiple points during analysis.
4. Recall that we converted ordinal responses (time ranges) by the principal to the midpoint of those ranges. The estimates in Table 4 decreased or increased by approximately 7 points if we used the lower or higher ends of the scale respectively (see the Appendix). Even if we rely on the most conservative estimates, when principals reported working any time at all on a particular domain, they reported working for an average of half an hour.
5. When principals did record an entry on the EOD log, an average of 15 minutes per time slot was not accounted for in any of the functional domains. Assuming that this is missing data, and not time away from work in between 8 a.m. and 5 p.m., principals in our study worked on average for 50 hours a week.

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