Principal Time Management Skills:
Explaining Patterns in Principals' Time Use, Job Stress, and Effectiveness

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Abstract
Time demands faced by school principals make principals' work increasingly difficult. Research outside education suggests that effective time management skills may help principals meet job demands, reduce job stress, and improve their performance. To test these propositions, we merged results from an instrument measuring the time management skills of principals in a large, urban district with time use data collected via in-person observations, survey-based self-assessments of job stress, subjective performance ratings from assistant principals and teachers, and student achievement growth data. We find that principals with better time management skills allocate more time to managing instruction in their schools but spend less time on interpersonal relationship-building. Perhaps as a result of this tradeoff, while we find that principal time management skills are associated with increased student test score growth in math, subjective assessments of principal performance are mixed, though ratings of principals' performance is positively associated with time management in high schools. We also find strong evidence that time management skills are associated with lower principal job stress. Building principals' time management capacities may be a worthwhile strategy for increasing their focus on instructional leadership and pursuing school improvement.

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In pursuit of a more nuanced understanding of school leadership practice and the connection between leadership practice and school improvement, several recent studies have focused on how principals allocate their time within the work day (e.g., Goldring et al. 2008; Horng, Klasik, and Loeb, 2010; Spillane, Camburn, and Pareja and 2007; Spillane and Hunt 2010; Grissom, Loeb, and Master 2012). These studies highlight the large and diverse set of school functions with which principals engage on a daily basis, spanning instruction, personnel, budgeting, student services, external relations, and a host of other areas. The large set of job

responsibilities with which principals are faced make time a scarce resource—and one that is only becoming scarcer as federal, state, and district policies create more comprehensive teacher observation and evaluation systems that require substantial time investment from school leaders (Donaldson 2011). Given this scarcity, principals must make decisions about how to allocate their time among competing job demands. These time use decisions are important for effective leadership, as evidenced by the relationship between principal time use and school outcomes (e.g., Grissom, Loeb, and Master 2012; Horng, Klasik, and Loeb 2010).

The connection between time use and performance motivates the present study. We proceed from the expectation that—just as some portfolio managers in the financial sector have a greater capacity for investing money in ways that produce profits—some principals will have a greater capacity for spending their time in productive ways. This greater capacity for using time effectively is known both colloquially and in a relatively large literature in psychology and organizational behavior as *time management.* That literature suggests that better time management skills—which include the ability to set achievable goals, identify priorities, monitor one's own progress, and remain organized (Claessens et al. 2007)—can lead to more effective time use and ultimately more positive outcomes, including reduced job stress and increased job performance, in some settings (e.g., Britton and Tesser 1991; Jex and Elacqua 1999). Time management and its relationship to time use and job outcomes, however, have largely been ignored in the context of school leadership.

This paper examines these relationships empirically using data from Miami-Dade County Public Schools (M-DCPS), the nation's fourth-largest school district. We draw on four data sources. The first is an original survey of M-DCPS principals we conducted during the spring of 2011. This survey included a time management inventory we used to measure four components

of time management skills among respondents (N = 287). It also included a series of items measuring principal job stress. Second, also in spring 2011, we employed trained observers to conduct daylong in-person observations of a subset of principals using a time use protocol. From these observational data, we create measures of principals' time allocations across job demands. The third source is a survey given to assistant principals and teachers in the same schools targeted by the principal survey. For this study, we use assistant principals' and teachers' responses to a set of questions about their principals to construct subjective measures of principal performance. Lastly, we merge each of these data elements with comprehensive administrative data covering all schools and personnel in the district provided to us by M-DCPS. In particular, the administrative data allow us to construct estimates of schools' "value-added" to student learning during each principal's tenure—measured by growth on Florida's standardized tests—in both math and reading.

We use this rich data source to answer four research questions. First, how are time management skills distributed across M-DCPS principals, particularly with respect to school and principal characteristics? Second, how do time management skills predict observed principal time use? Third, how are time management skills associated with principal job stress? And finally, to what degree, if any, are time management skills predictive of measures of principal effectiveness? The next section grounds these questions in existing research on time management and the connections psychologists and scholars of organizational behavior have made between time management and personal and organizational outcomes. We then describe the data sources, construction of measures, and estimation approach before presenting our results. The final section discusses the implications of our results for school leadership practice.

How Can Time Management Behaviors Improve Outcomes?

High demands on one's time are characteristic of many professions. As Britton and Glynn (1989, 429) put it, "intellectually productive people usually have more things that they would like to do, or need to do, than they have time." This description applies to the job of most school principals, who have responsibility for the time-intensive tasks of managing school operations, overseeing instructional programs, building relations among staff members, and so forth (Horng, Klasik, and Loeb 2010). In such professions, becoming more productive means finding ways to accomplish more given limited time. Managing one's time more ably is one way to fulfill this goal.

Time management means those behaviors "that aim at achieving an effective use of time while performing certain goal-directed activities" (Claessens et al. 2007, p. 262). Although little work has examined time management in the context of school administration, a relatively large literature has investigated the concept in the management of organizations more broadly. We draw on this literature in describing the characteristics of positive time management behaviors in schools and developing expectations about the role of time management among school principals in affecting their capacity to promote school improvement.

Components of Good Time Management

Research identifies a number of techniques and behaviors associated with effective management of time. For example, studies find that one can use time efficiently and productively by setting short-term and long-term goals, keeping time logs, prioritizing tasks, making to-do lists and scheduling, and organizing one's workspace (Claessens et al 2007; Macan 1994). These time management techniques and behaviors tend to share some underlying traits in common and

can be classified into several groups. Britton and Tesser (1991) proposed three facets of time management: short-range planning, long-range planning, and time attitudes. Short-range planning is the ability to set out and organize tasks in the short run (e.g., within a day or a week). Long-range planning is the capacity to manage tasks over a longer time horizon (e.g., in a quarter or a year) by setting goals, keeping track of important dates and limiting procrastination. Positive time attitudes indicate that a person is oriented towards using their time constructively and maintaining agency over how their time is spent.

Employing a different conceptualization, Macan (1994) identified three components of time management: (1) setting goals and priorities, (2) mechanics (i.e., making lists and scheduling), and (3) preference for organization. The first includes such behaviors as setting goals one wants to accomplish and prioritizing tasks to achieve these goals. The second includes behaviors associated with managing time such as making to-do lists and scheduling. The final factor includes one's preference for organization in his or her workspace and approach to projects. While this categorization differs somewhat from Britton and Tesser's (1991), the themes of goal-setting, prioritization, and organization are common to both schema.

Studies suggest that people vary systematically in their time management behaviors and techniques. For example, Macan et al. (1990) compared time management behaviors across demographic groups in a sample of undergraduate students. While time management behaviors did not differ by race, older and female subjects were more likely to be good time managers. Older students also had greater preference for organization. Other studies of undergraduate students found similar results (Trueman and Hartley 1996; Misra and McKean 2000). Researchers have also explored the relationship between time management and other dispositional characteristics such as self-esteem, sense of purpose in life, polychronicity (i.e.,

multi-tasking), and impatience, and propensity to procrastinate (e.g., Bond and Feather 1988; Francis-Smythe and Robertson 1999). For example, Lay and Schouwenburg (1993) found that students prone to procrastination exercised fewer time management techniques while also tending to be further behind on work and to study fewer hours.

Time Management and Job Outcomes

Several studies demonstrate that time management predicts job performance. For example, car salesmen with better time management skills have higher sales (Barling et al. 1996). College students with better time management skills report higher grade point averages (Britton and Tesser 1991; Macan et al. 1990). County extension directors with better time management skills are rated higher by their superiors (assistant regional directors) (Radhakrishna, Yoder, and Baggett 1991).

To understand the association between time management and job performance, researchers have investigated a series of possible linkages. Most clearly, time management helps improve job efficiency by enabling professionals to allocate adequate time to their job's most important tasks (Hall and Hursch 1982; Orpen 1994; Schuler 1979). This greater attention to high-priority work areas improves worker outcomes. The expectation that increased time management will increase worker productivity by enabling employees to "work smarter" has driven widespread investment in time management training in the private sector (Green and Skinner 2005).

Studies also suggest that effective time management reduces job stress, which can be an important impediment to job performance (e.g., Jamal 1984). An important source of job stress in the workplace is the perception for an individual that what he or she needs to accomplish

outpaces the time available (Schuler 1979). Time management can help reduce this discrepancy. Using path analysis, Macan (1994) found that subjects with better time management skills perceived that they had greater control over their time and how they spend it, which was in turn associated with both reduced feelings of job-induced tension and lower reports of *somatic tension*, or physical symptoms of stress such as insomnia and headaches. Job-induced stress was then negatively correlated with self-assessed job performance. Claessens et al. (2004) documented similar paths from time management to perceived time control to reduced work strain and higher job performance in a study of engineers in a semiconductor manufacturer. Other studies have documented the positive association between time management and employee health, mediated by other factors such as perceived control and conflicts between the demand between work and family (e.g., Adams and Jex 1999; Jex and Elacqua 1999).

Time management is also predictive of other factors that might influence job performance. Professionals who manage time better report lower emotional exhaustion, the most important dimension of job burnout (Peeters and Rutte 2005). They also report higher overall job satisfaction (Macan et al. 1990). Participants in time management training also report greater work/home balance (Green and Skinner 2005). A long literature shows that satisfaction and satisfaction-related factors contribute to employee performance (see Judge et al. 2001).

Of course, better time management need not lead to better job performance under all conditions. Increasing job performance requires engaging in more productive behaviors. According to Ajzen (1991), human behavior is a function in part of how much control one perceives he or she has over that behavior. Control is constrained by resources, including time and skills; time management increases perceptions of control by relaxing some of these constraints (Macan 1994). Workers may face other kinds of constraints on their behavior,

however, such as institutional limits on their autonomy, that time management can do little to address. Moreover, behavior change requires intent (Ajzen 1991). If workers do not intend to engage in new behaviors or do not know which behaviors will be more productive, we would not expect better time management to enhance performance.

Studies of Time in Educational Administration

Although typically overlooking time management specifically, research in educational administration has documented the importance of how principals organize and allocate their time. Studies of principal time use using in-person observations and daily logs show that principal time spent on organizational management (e.g., personnel, budgeting) and operations predicts student achievement and other school outcomes (Horng, Klasik, and Loeb 2010; May, Huff, and Goldring 2012). Studies also find that principals' time investments in some instruction-related tasks, including coaching and teacher professional development, are associated with more positive student outcomes (Grissom, Loeb, and Master 2012). A long literature on instructional leadership suggests a connection between principals' involvement in instructional matters in their schools and positive school performance (see Robinson, Lloyd, and Rowe 2008).

Yet studies also suggest that finding time to devote to tasks more closely associated with improving student learning is a consistent challenge. The principal work day is hectic, filled with frequent interruptions and problems that require attention (Blendinger and Snipes 1996; Hallinger and Murphy 2013). Principals are often called on to meet with parents or deal with parental concerns (Miller 2001). They spend large portions of their days in planned and unplanned meetings and on completing administrative duties (Morris et al. 1981; Horng, Klasik,

and Loeb 2010). Manasse (1985) notes that "the nature and pace of events often appear to control principals rather than the other way around" (p. 442). Indeed, Hallinger and Murphy (2013) identify finding time to lead in the face of principals' job pressures as among the central challenges of leadership for school improvement.

Given the importance of principal investment in organizational management and instruction for school performance, a reasonable presumption is that principals who are able to overcome constraints imposed on their work day by other time demands would reallocate their time towards these areas. Insofar as greater time management skills provide a strategy for overcoming time pressures, we hypothesize that time management will be positively associated with time spent on management and instruction and negatively associated with time allocated to less "productive" tasks, such as conversing with staff members or taking care of personal, non-work business. While the relationship between principal time management and time use is the focus of our analysis, we also investigate the degree to which better principal time management is associated with job stress and job performance measures, such as school improvement, which other studies suggest may be evident if—among other mechanisms—better time managers allocate their attention more productively over the long term. The next section details the data we use to test for relationships between time management, time allocation and school performance.

Data, Measures, and Methods

Data for this study come from a comprehensive data collection undertaken in Miami-Dade County Public Schools (M-DCPS), a large urban district educating approximately 350,000 students each year. Nearly two-thirds of the M-DCPS student population is Hispanic, and three-

fourths are eligible for the subsidized lunch program. The data include survey responses, observational measures, and administrative data on students, staff and schools.

Surveys. We measured principals' time management skills and job stress using instruments (described below) embedded in a larger web-based survey of all principals of non-special schools in the district that we conducted in the spring of 2011. We received responses from 287 principals for a response rate of 86%.[1] Because of missing data or incomplete responses, the analytic sample for the study was reduced to 248 principals, a 74% response rate from the original population.

At the same time that we administered the principal survey, we also conducted surveys of all M-DCPS assistant principals (APs) and teachers. We received 411 usable responses to the AP survey for a response rate of 74%. Teacher response rates were much lower; we received partial or full responses from 8,055 teachers for a response rate of 36%. The low teacher response rate means that results from the teacher surveys should be interpreted with caution. For this study, we make use of a three-item subjective assessment of the principal's performance included on both the AP and teacher survey. Because of high inter-item reliability (Cronbach's $\alpha = 0.95$ for APs and 0.94 for teachers), we combined these items ("My principal is doing a good job," "I am pleased with the way my principal runs this school," and "I would be happy to continue working with my principal in the future") using factor analysis to form a single assessment of the principal for each AP and teacher respondent and standardized for ease of interpretation.

Observations. Next, we utilized data from in-person observations of a sample of 98 M-DCPS principals that a team of observers conducted between late March and early April of 2011.

[1] We tested for systematic differences in observable characteristics (from the administrative records) among respondents and non-respondents but found no statistically significant differences for any school or principal characteristic.

The observation sample included principals from each of the district's high schools[2] plus a random sample of 30 elementary and 30 middle schools stratified by the district's administrative regions.[3] For each of the 98 observed principals, trained observers used a standardized protocol (available from the authors upon request) to capture time on approximately 50 job-related tasks. Observations measured time use in five-minute increments over a full school day. We aggregated the observation data to capture time allocations across five broad areas according to the classification used by Grissom and Loeb (2011). These areas are: organizational management, instructional management, administration (e.g., compliance, scheduling), internal relations (i.e., maintaining positive relationships among staff), and external relations (i.e., making connections to outside stakeholders, such as parents). We also utilize measures of time spent transitioning from place to place around the school building and personal time, or time spent on non-work activities. For our analysis, we then calculated the percentage of the work day the principal spent in each area. Table 1 gives descriptive statistics for these variables for the 83 principals in the analytic sample.[4] Principals spent the largest portion of their day on administration (33%), followed by internal relations (22%). Note that the percentages do not sum to 100 because observers could code more than one kind of task at a given time point.

Administrative Data. Lastly, we use comprehensive administrative data on district personnel and students provided to us by M-DCPS central staff for the years 2003-04 to 2010-11. Administrative data files are the source of a variety of control variables included in the analysis at both the personnel level (e.g., gender, race, age, education level, tenure in school) and school level (e.g., percent free/reduced lunch, percent Hispanic, enrollment size, Florida school

[2] We attempted to schedule observations with each of the district's 43 high schools but were only able to schedule observations at 38.
[3] To ensure geographic spread, five elementary and five middle schools were randomly chosen from each of the district's six administrative regions.
[4] 15 principals were dropped due to missing data on other variables.

accountability grade). Table 1 provides descriptive statistics for the 2010-2011 school year for the principals included in our analysis and the schools in which they work (accountability grades are from the prior year).

We also use the student-level file from the district, which includes student scores on the Florida Comprehensive Assessment Test (FCAT) in math and reading over time as well as student background characteristics. With these data, we construct measures of school value-added to student achievement during a principal's tenure. Following Grissom, Kalogrides, and Loeb (2012), we use two measures. The first is a measure of how much student learning growth there has been in the current school *over all years he or she has been the principal there*. We provide the empirical model in the Appendix, but to summarize, the equation models student FCAT scores, standardized within grades across the district, in the present year as a function of last year's score, student demographic characteristics, classroom-aggregate demographic characteristics, and time-varying school characteristics, plus a principal-by-school fixed effect. The coefficients from these fixed effects are then shrunk using the Empirical Bayes method to account for measurement error; these shrunken estimates represent the value-added scores. Only the scores for the school in which the principal is working in 2011 are used for our analysis, though again, these measures represent students' achievement gains in that school over up to 7 academic years. The second approach is identical to the first, only the empirical model includes a control for school value-added under the school's prior principal as a means of adjusting for the "starting point" for the current principal. Further details on both models are available in Grissom, Kalogrides, and Loeb (2012).

Measuring Principal Time Management

To assess principals' time management skills, our principal surveys included a modified version of Britton and Tesser's (1991) Time Management Questionnaire (TMQ). The TMQ was developed to measure time management among college students, so we adjusted the wording of some items and dropped two others to make the instrument appropriate for school principals. In Britton and Tesser's (1991) study, factor analysis of the TMQ identified three dimensions of time management: short-range planning, long-range planning, and time attitudes. Hypothesizing that principals' positions as managers mean that—unlike college students—they may use delegation of tasks to others as a strategy for managing their time, we also added 4 original items to capture this construct. Table 2 describes the 21 items which were preceded by the prompt, "How frequently would you say you do each of the following?" Principals responded on a four-point scale (*never*, *sometimes*, *frequently*, *always*).

Exploratory factor analysis of our modified 21-item time management scale using varimax rotation uncovered four constructs, though differences in the item patterns from those described by Britton and Tesser (1991) necessitated a renaming of our constructs (Table 2). The first factor aligns closely with Britton and Tesser's (1991) *short-range planning* factor, so we maintain this nomenclature. The items that load highest on this factor are *planning your day before you start it* (factor loading = 0.83), *making a list of the things you have to do each day* (0.82), and *making a schedule of the activities you have to do on work days* (0.82).

We label the second dimension *poor time consciousness.* These items relate to not approaching time as a resource to be actively managed, such as *finding yourself working on assignments or reports the night before they are due* or *finding yourself being late for a meeting or event*. This dimension comes closest to what Britton and Tesser (1991) describe as *time attitudes*.

The third factor is a new factor, delegation, and all four survey items meant to measure the factor loaded well, as we expected. Among the items, three have factor loadings greater than 0.6: *asking your assistant principal to handle a situation so you can direct your attention elsewhere* (0.81), *delegating minor issues to an administrative assistant or other staff* (0.79), and *relying on an administrative assistant to screen out less important issues before they reach your desk* (0.62).

The final factor, which we label *focus*, reflects the degree to which principals are able to maintain concentration and control over how their time is spent. The items that load most highly onto this factor are *keeping your desk clear of everything other than what you are currently working on, making the most constructive use of your time, feeling you are in charge of your own time*, and, negatively, *finding yourself getting diverted from the task at hand.* Each of these items loads onto this factor at approximately 0.6.

As a final summative measure capturing overall time management skills, we also created a single *time management* index via a factor analysis with only one factor. Inter-item reliability for this scale was high (Cronbach's $\alpha = 0.76$). Loadings for this measure are shown to the right in Table 2, as are means for each of the items.[5] We make use of both this aggregate time management measure and the four sub-measures in the analyses that follow.

Job Stress Measures

Studies of psychological and biological stressors suggest that situations characterized by lack of control, unpredictability, social-evaluative threat, and novelty or change are more likely to cause job stress (Nicolson 2008). Uncontrollable and unpredictable events have long been

[5] Four respondents failed to answer a small number of items on the time management inventory. For these respondents, we used the responses for the items they did answer to impute the factor score on the time management index.

linked to increased stress (e.g. Averill 1973; Masserman 1971). For example, one study of nurses finds higher stress in situations that combine high workload with low decision-making latitude (Landsbergis 1988). Social-evaluative threat is a source a stress stemming from a desire to belong and have high status in a social situation. Given the desire for status, the belief that one is being evaluated can cause stress (e.g., Dickerson, Gable, Irwin, Aziz, and Kemeny 2009; Dickerson, Gruenewald, and Kemeny 2004). Finally, novelty or change can lead to stress, particularly if it is frequent and are not accompanied by sufficient planning (Lazarus and Folkman 1984; Rafferty and Griffin 2006).

To operationalize principals' job stress, we designed a short survey instrument to measure these four predictors of job stress based on a teacher stress survey developed by National Union of Teachers (2007). Their survey was designed to measure six key job stressors: demands, control, support, relationships, role, and change. These concepts overlap a great deal in three of the above four predictors (i.e., lack of control, unpredictability, and novelty or change), so we selected survey items that closely align with them and then edited them appropriately for school principals. We added three original items to capture social-evaluative threat. In total, we included 12 job stress items, which are shown in Appendix 1. Principals' agreement with each item was elicited via a four-point scale (*strongly disagree, disagree, agree, strongly agree*).

Exploratory factor analysis of the 12 stress items uncovered only one clear job stress factor.[6] We used the resulting factor scores to construct a single job stress variable (Cronbach's α = 0.79), which we standardized to ease interpretability.

Methods

[6] Determination of the number of factors was made by examining a scree plot.

The three research questions we ask require a mix of analytical approaches. For the first question, which asks how time management skills are distributed with respect to school and principal characteristics, we conduct *t*-tests for differences in time management skills by these characteristics. For the remaining questions, which ask how time management skills predict time allocation and whether time management skills are associated with principal job stress and effectiveness measures, we use a multivariate regression approach. In particular, we model outcomes—either time allocation, job stress, or measures of principal effectiveness—as a function of time management and a set of school and principal control variables (shown in Table 1) obtained from administrative data. In this way, we ask whether similarly situated principals who are better at time management allocate their time differently, have differential stress, or are differentially effective at improving student achievement.

Examining Time Management across Principals and Schools

Principals' time management behaviors could be different among principals with different personal characteristics or in different job settings (Claessens et al 2007). For example, more experienced principals may have better time management practices as they have had more time to adjust to job demands. Similarly, principals in more difficult school environments may have adapted different time management practices to cope with job demands. To test for such differences, we conducted simple two-sided *t*-tests to compare principals' scores on each of the five time management measures (the overall scale and the four subscales) by selected principal and school characteristics. Table 3 displays the results. The first column reports the result for the overall time management factor, while the remaining four columns report the findings for the subscales.

Among principal characteristics, only gender shows significant differences for the summary time management measure, with men reporting lower time management scores than women. However, using the subscale, while men score lower on short-range planning, they score higher on delegation. There are no significant differences in the subscales by race. Principals with only Bachelor's degrees score lower on focus relative to higher levels of education. Interestingly, a longer tenure in the same school is associated with higher degrees of delegation, whereas it is also associated with less short-range planning behavior.

Among school characteristics, we find no significant differences by past school performance (as proxied by the school accountability grade) or student demographics (not shown), though there are some differences by school level and size. In particular, principals in elementary schools and smaller schools report better time management. Elementary and middle school principals report more short-range planning behavior than do high school principals. Small school principals report greater task focus, while principals at mid-size school score higher on short-range planning.

Time Management as a Predictor of Principal Time Allocation

To investigate whether principals with better time management skills allocate their time differently across different areas of job demands—and specifically towards areas more closely associated with school performance—we rely on the in-person observation data. We aggregated the data on time spent on each of the approximately 50 possible tasks into seven broad categories (Grissom and Loeb 2011): organizational management, instructional management, administration, internal relations, external relations, transition time, and personal time. We then calculated the percentage of the work day the principal spent in each area (see Table 1).

To assess the relationship between time use and time management, we ran separate regression models with the percentage of time spent in each of the seven time-use categories as the dependent variable and including time management measures and school and principal controls as regressors. Table 4 gives the results for the overall time management score. Each column reports the findings from a regression model with both school and principal characteristics.

Our main interests are in time spent on organizational management and instruction, as those have shown benefits for students. Results for the former show no evidence that principals exercising greater time management spend more time on organizational management tasks. They do, however, appear to spend more time on instruction in their schools. This category of tasks includes coaching, classroom walk-throughs, and planning teacher professional development. A one standard deviation increase in time management skills is associated with an increase of about 3% of the day spent on instruction management. Given that only about 13% of the average principal's day is spent on instruction-related tasks, this association is both statistically significant and practically meaningful.

In contrast, we find that a 1-s.d. time management is associated with 4% *less* of the work day spent on internal relations in the school, suggesting internal relations is the area that the increase in instructional time is traded off against. Tasks in this category include interacting socially with staff, attending school activities, and counseling staff and/or students. It may be that principals with poorer time management practices are pulled into internal relations tasks when they mean to be focusing more on instruction. For no other time task category is time management statistically significant at conventional levels.

We next investigate the relationship between time management and instructional management and internal relations further by re-running the models replacing the time management summary measure with the four subscale measures. Table 5 provides the results. The table shows that a 1-s.d. improvement in time consciousness is associated with an increase in instructional time of approximately 21 percent. We also find evidence that short-range planning skills are associated with more time on instruction ($p < 0.10$). The other two subscales (delegation and focus) are found to be uncorrelated with instructional time, although the sign of both coefficients are positive. For internal relations, short-range planning skills primarily drive the decrease in time spent on internal relations ($\beta = -3.0$, $p < 0.05$). Delegation and focus are also negatively associated with time on internal relations tasks but their estimates are less precise.[7]

The positive association between time management and overall time spent on instructional tasks sparks the question of which areas of principal instructional investments are driving this relationship. To answer this question, we disaggregate the instructional management category into six subcategories: classroom observations; evaluation of teachers, curriculum, and educational programs; coaching teachers; developing educational programs; professional development for teachers; and other instructional tasks (e.g., reviewing student data, fulfilling special education duties). We then run separate models for each of these variables and report the results in Table 6. The results suggest that better time management is positively associated with time spent on classroom observations ($\beta = 1.1$, $p = 0.08$). Given that an average principal spends 5.7 percent of the day on classroom observations, this coefficient suggests that a 1-s.d. improvement in time management is associated with a 19 percent increase in time on observations. Time management is also positively associated with the "other instructional tasks"

[7] We also investigated whether other task categories were associated with the four subscale measures. The only significant finding from this analysis (not shown), is that short-range planning behaviors are negatively correlated with personal time ($\beta = -1.1$, $p < 0.10$).

category. In addition, the time management coefficient is positive in the models for evaluation, coaching, and developing educational programs, and although these coefficients are not statistically significant at conventional levels, their relatively low *p*-values—0.16, 0.13, and 0.17, respectively—are suggestive of a relationship that might be more apparent in a larger sample.

As an additional look at principal time use, we also ran models examining principal location, which observers coded throughout the observation period. Prior studies have found that the average principal spends more than 50 percent of the day in his or her office, which may be inconsistent with a hands-on instructional leadership role (e.g., Horng et al. 2010). In our sample, principals spent about 41 percent of their day in their offices and 10 percent in classrooms. As shown in Table 7, better time management is associated with differences in location. In particular, principals with better time management skills spent less time in their offices and more time in classrooms and elsewhere. A 1-s.d. increase in the skill measure is associated with a reduction of time spent in one's office of about 5 percentage points. Of this time *not* spent in the office, about 28 percent is increased time spent in classrooms (model 2, 1.4 percent of day) and the remainder is allocated elsewhere (model 3).[8] This result is consistent with the conclusion that time management is positively correlated with increased capacity for instructional leadership.

Time Management and Job Stress

Research outside education suggests that good time management helps reduce the job stress that accompanies the pressures of needing to accomplish more than can be done in the time available (Jex and Elacqua 1999). We test this hypothesis for principals by estimating models of job stress as assessed by the stress inventory we included in the principal surveys (N = 247).

[8] We attempted to break "other location" down into its component parts (e.g., hallway) but did not find time management to be statistically associated with any of these individual locations.

Table 8 reports the results. The first two columns show models using the summary time management measure, and the next two columns show models for the four time management components. Even-numbered models include principal characteristics.[9]

Our hypothesis appears to be strongly supported by the data. Principals with strong time management skills report much lower job stress, regardless of whether or not we control for principal characteristics. A 1-s.d. improvement in time management skills is associated with a reduction in job stress of about a fourth of a standard deviation ($p < 0.01$). Models 3 and 4 show that better short-range planning and focus are negatively associated with job stress, while poorer time consciousness predicts greater stress. Only delegation is uncorrelated with the stress measure. We caution, however, that common-source bias may inflate the correlations among the time management and job stress measures.

Are Better Time Managers More Effective Principals?

Differences in time allocation and job stress for principals with strong time management skills suggests that time management can play a role in how the principal runs the school. Time management may thus help explain principal effectiveness. To test the hypothesis that more effective principals manage their time better, we measure job performance in two ways, first as how much student test score growth occurs in the school under the principal, then using subjective assessments provided by APs and teachers via surveys.

Student Test Score Growth

[9] Principal characteristics are omitted from the table for brevity. Among these measures, only age was significantly associated with job stress, with younger principals reporting higher stress levels.

Table 9 shows the value-added results using the overall time management variable. In these models, principals' value-added scores in math (columns 1 and 2) and reading (columns 3 and 4) are the dependent variables. The models control for principal characteristics (school characteristics are incorporated into the value-added measure itself). Even-numbered models use a value-added score that is adjusted for the performance of the school at the time the principal arrived; odd-numbered models do not include this adjustment. Because this adjustment requires previous years' school performance data, it results in much smaller sample sizes.

In math, the results show a positive relationship between time management and student test score growth over the time the principal has worked in his or her current school, though only in the second model ($p < 0.10$). The coefficient suggests that a one standard deviation increase in principals' overall time management skills predicts a principal value-added score that is approximately 0.02 points higher, or about 0.17 standard deviations on the underlying principal effects scale. Estimates using the four subscale measures suggest this association is driven mostly by the correlation between principal value-added and principals' short-range planning skills and behaviors (see Appendix Table 2). In both models, however, the adjusted R^2 is essentially 0, suggesting that there are other, unobserved factors that predict the value-added measure more strongly. We find no evidence of a significant correlation between time management and growth in reading in either model.

Because differences in school organization and job demands might predict differential importance of time management for principals across school levels, we also tested for evidence of differences among elementary, middle, and high school principals (not shown).[10] For math, the coefficients that correspond to model 2 in Table 9 were positively signed at all three levels (and 1.5 times and twice as large in middle and high schools, respectively), though given the

[10] Results available from authors upon request.

much smaller samples, not statistically significant.[11] Results for reading were similarly statistically indistinguishable from zero.

Subjective Assessments

As described in detail in Grissom, Kalogrides, and Loeb (2012), there are numerous drawbacks of using value-added models to measure of principal effectiveness. In particular, these measures may do a poor job of isolating the contribution of the principal from the contributions of other school factors. Despite the appeal of measuring effectiveness by student learning, questions about validity of the measures lead us to assess the relationship between time management and subjective assessments of principals as well.

Table 10 repeats the principal effectiveness analysis, this time using the subjective assessments provided by APs and teachers. The AP assessment results are shown in the upper rows, and the teacher assessments in the lower rows. In each case, we show results first for all schools combined, then separately for elementary/middle schools and high schools. All models include controls for characteristics of schools and assistant principals or teachers, though these coefficients are omitted from the table for brevity.

The coefficients in Table 10 reveal a nuanced pattern of results. Model 1 suggests that, on average, principal time management is associated with *negative* assessments of principal effectiveness from their APs (β = -0.13, $p < 0.10$). Splitting the schools by level, however, we see that, in fact, the association is positive for high school principals (β = 0.18, $p < 0.10$), where the complexity of the work environment makes principal time management arguably more

[11] The sample size for even-number models ranges from 16 at the high school level to 70 at the elementary school level.

important. Among elementary and middle principals, the association is negative (β = -0.25, p < 0.01).[12]

The results for teachers' subjective assessments show no evidence of an association between time management and principal effectiveness in the sample of all schools, but, as with the AP assessments, pooling the schools masks a positive association for high schools. For these schools, a one standard deviation increase in the time management factor is associated with a 0.10 standard deviation increase in the subjective assessment (p < 0.05). The point estimate for the sample of elementary and middle schools is negative but not statistically significant.[13]

Discussion and Conclusions

Research outside of education has shown that time management skills can provide professionals in demanding workplaces with strategies for making more out of scarce time resources, allowing them to focus attention on high-priority matters in ways that may improve their overall job performance (Claessens et al. 2007). The goal of this study was to assess whether these claims apply to school leaders, a group for whom increasing job demands and expectations are raising concerns that "the job simply is not doable" (Institute for Educational Leadership 2000, p. 12).

Modifying an instrument used in numerous prior settings to assess time management capacities (Britton and Tesser 1991), we find principal time management to be multidimensional, encompassing skills and behaviors related to short-range planning, time consciousness,

[12] Results for the subscale measures are shown in Appendix Table 3. The results show that the negative association between time management and APs' assessments in elementary and middle schools is driven by a negative association with short-range planning behavior. The positive association for high schools is driven by a combination of short-range planning, delegation and focus, though neither is statistically significant in the small sample.

[13] Appendix Table 3 shows a statistically significant negative correlation between teachers' assessments and principal delegation for elementary and middle schools. For high schools, all four subscale measures are positive—the coefficients for short-range planning and focus are the largest—but only the coefficient on short-range planning is statistically significant.

delegation, and focus. Although we find that principals rate their overall time management skills higher in elementary schools and smaller schools, where perhaps time management is simpler, characteristics predicting subscale scores vary, with no principal or school characteristics a significant predictor of more than two subscales.

We do find, however, that better time management is associated in some ways with what prior studies might describe as more "productive" time investments (Horng, Klasik, and Loeb 2010; Robinson, Lloyd, and Rowe 2008). In particular, principals capable of managing their time better spend more time on instruction management and, in particular, on classroom observations, and less time on internal relations in their schools. They spend no more or less time on other task areas. In particular, we found no additional time spent on organizational management tasks, which have been found beneficial in prior analyses (Horng, Klasik, and Loeb 2010). The connection between time management and instruction supports the idea that principals consider instruction their highest priority area, on average; principals with the skills to prioritize and "find" time within their work day typically allocate those found resources to instructional leadership tasks.

We also examined whether good time management skills are associated with lower principal job stress, finding strong evidence of a relationship. Our results are consistent with previous studies that found that good time management leads to perceived time control, which leads to less job-induced stress (Macan 1994; Claessens et al 2004). Job stress is important both as a predictor of performance and other outcomes, such as turnover (Jamal 1984).

Whether better time management ultimately translates into better job performance is a challenging question to answer, in part because reliable measures of principal job performance are difficult to construct. Our results might best be described as suggestive. Using a student test

score growth-based measure of principal job performance, we find a positive correlation with time management, but only for one value-added measure in one subject (math). A potential explanation for the lack of relationship between time management and student performance may stem from how principals use the freed-up time. While time principals' spend on coaching and evaluating teachers has been linked to positive outcomes for students, time on classroom observations has not (Grissom, Loeb, and Master 2012). Although observations are a useful source of information for principals, this information is only useful if actually used, and some research finds that most principals do not utilize information well for key leadership functions, such as providing feedback to teachers (Ing 2010).

Subjective job assessments from APs and teachers show positive correlations with time management for high school principals only, and in fact negative correlations for elementary and middle principals. It may be that time management is more important for high school principals who face a larger number of competing time demands. The inconsistency of this result mirrors the mixed evidence on the time management–job performance link in other research (e.g., Barling et al. 1996; Macan 1994). Job performance is a function of a large number of factors, many of which are difficult to observe, and may be especially difficult to measure in a profession in which the influence of one's performance on outcomes are mediated and indirect (Hallinger and Heck 1998).

Still, the themes of the findings we present—that principal time management is associated with more productive work behaviors and, in some cases, more positive school outcomes—provide initial evidence that time management matters for principal work. One reason this connection deserves further attention is that time management is a relatively straightforward set of skills that can be learned and developed (Macan et al. 1990). A large

number of training modules and workshops are available and have been widely utilized in the private sector, though these programs vary in their efficacy (Claessens et al. 2007). With relatively small time and resource costs, even modest benefits of time management training for school principals can make such investments cost-effective.

Several limitations of this study should be underscored. Perhaps most important is the issue of measurement error, present to some degree in each of the main variables utilized in this analysis. Self-reports on the time management instrument will be imperfect measures of actual time management skills and behaviors. The reliability of value-added measures of educator performance drives many debates over the use of these measures (Grissom, Kalogrides, and Loeb 2012). Subjective assessments of principal performance by others in the school may be colored by interpersonal relationships or the fact that APs and teachers cannot observe every dimension of their principal's work. Random error in the value-added and subjective assessment measures will make statistical significance in regression models less likely, perhaps partially accounting for the mix of findings related to principal job performance. Error in the time management measures (an independent variable) is more problematic because it creates the potential for bias. Finally, this study focuses on a single school district with unique demographic characteristics, and we cannot be sure that our findings would generalize to principals in other contexts.

For these reasons, further exploration of the role of time management in the work of school administrators using more refined or validated time management instruments, alternative outcome measures, and larger samples would be worthwhile. Future research might also consider factors mediating the relationship between time management and outcomes (e.g., Macan 1994) or examine whether time management is more closely associated with outcomes under some

conditions. Workload and job autonomy, for example, may influence the degree to which time management skills are useful (Claessens et al. 2007).

APPENDIX: Estimation of Principal Value-Added

Our analysis relies on estimates detailed in Grissom, Kalogrides, and Loeb (2012). We use two measures. The first is based on a model described by Equation 1:

$$A_{ispt} = A_{is(t-1)}\beta_1 + X_{ispt}\beta_2 + S_{spt}\beta_3 + C_{spt}\beta_4 + \tau_y + \gamma_g + \delta_{sp} + \varepsilon_{ispt} \quad (1)$$

Equation 1 models the achievement of student *i* in school *s* under principal *p* at time *t* as a function of the student's achievement last year, plus a vector of student covariates *X* (race/ethnicity indicators, gender, free or reduced priced lunch status, whether they are currently classified as limited English proficient, whether they are repeating the grade in which they are currently enrolled, lagged absences, lagged suspensions), school covariates *S* (the school-level aggregates of all the variables in *X*), classroom covariates *C* (the classroom-level aggregates of all the variables in *X*), and fixed effects for time (τ) and grade level (γ). The model also includes a principal-by-school effect, δ, which captures the mean growth of that school during the year the principal works there after the other variables in the model have been taken into account. The coefficients on δ are then shrunk using the empirical Bayes method to account for measurement error, though given the large number of students used to calculate this estimate, shrinkage produces few differences from the original estimates.

In a second approach, we add an additional term, *E*, as shown in Equation 2:

$$A_{ispt} = A_{is(t-1)}\beta_1 + X_{ispt}\beta_2 + S_{spt}\beta_3 + C_{spt}\beta_4 + \beta_5 E_s + \tau_y + \gamma_g + \delta_p + \varepsilon_{ispt} \quad (2)$$

E is the school value-added at the time a principal enters the school, calculated over all prior years of data using an equation that replaces δ in Equation 1 with a school fixed effect, then using the coefficients from those fixed effects. Equation 2 calculates principal value-added estimates over years that a principal leads any school (i.e., there is no *s* subscript on δ) but controls for the performance level at any school at which he or she begins working.

APPENDIX TABLE 1: Factor Analysis of Job Stress Items

	Item mean	Factor loading
I sometimes feel anxious about the stability of my job.	2.41	0.75
I have difficulty coping with the pace of organizational change.	1.97	0.72
I often struggle with uncertainty about my role and duties.	1.95	0.71
I feel overwhelmed by unrealistic improvement targets or initiatives.	2.32	0.70
I lack control over important decisions that affect the quality of my work.	2.20	0.68
I enjoy a reasonable degree of autonomy to do my work as I think best.*	3.13	0.61
I usually feel secure that my job conditions will not worsen.*	2.66	0.58
My ability to take initiative in my job is hindered by how I am monitored and evaluated.	2.05	0.58
Changes in my job are accompanied by appropriate support and training.*	2.76	0.58
I cope well with changes in my job.*	3.17	0.57
I feel confident that the quality of my work has the reputation it deserves.*	3.16	0.57
I am often aware of how others are judging the quality of my work.	2.89	

Items followed by * are reverse-coded in the creation of the factor score. Eigenvalue = 4.6; Cronbach's $\alpha = 0.79$. Items are on a 4-point scale. Loadings lower than 0.35 not shown.

APPENDIX TABLE 2: Four Time Management Factors and Principal Value-Added

	Mathematics		Reading	
	Value-Added Model 1	*Value-Added Model 2*	*Value-Added Model 1*	*Value-Added Model 2*
	(1)	(2)	(3)	(4)
Short-range planning	0.0033	0.0226**	-0.0003	0.0087
	(0.0093)	(0.0102)	(0.0074)	(0.0081)
Poor Time Consciousness	0.0062	-0.0004	0.0062	0.0082
	(0.0097)	(0.0127)	(0.0066)	(0.0066)
Delegation	0.0050	0.0058	0.0037	0.0060
	(0.0097)	(0.0095)	(0.0076)	(0.0058)
Focus	0.0130	-0.0004	0.0084	-0.0058
	(0.0107)	(0.0158)	(0.0080)	(0.0084)
Constant	0.1006	0.0766	0.0163	-0.0091
	(0.0820)	(0.0952)	(0.0626)	(0.0597)
Observations	247	107	248	107
Adjusted R-square	0.13	0.00	0.07	0.08
F	5.03	1.22	2.97	2.59

Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Models include principal characteristics. School characteristics not included because they appear in the models that create the value-added measures.

APPENDIX TABLE 3: Four Time Management Factors and Subjective Assessment of Principals by Assistant Principals and Teachers

	Subjective assessment by assistant principals		
	All schools	Elementary and middle school	High school
	(1)	(2)	(3)
Short-Range Planning	-0.19**	-0.28***	0.04
	(0.08)	(0.09)	(0.10)
Poor Time Consciousness	0.01	0.03	-0.07
	(0.05)	(0.07)	(0.07)
Delegation	0.02	-0.04	0.27
	(0.07)	(0.07)	(0.18)
Focus	0.06	0.00	0.14
	(0.07)	(0.08)	(0.14)
Observations	319	231	88
Adjusted R-squared	0.02	0.02	0.00
F	1.17	1.17	3.41

	Subjective assessment by teachers		
	All schools	Elementary and middle school	High school
	(4)	(5)	(6)
Short-Range Planning	0.01	-0.01	0.10**
	(0.03)	(0.03)	(0.04)
Poor Time Consciousness	-0.01	0.03	-0.09
	(0.03)	(0.04)	(0.06)
Delegation	0.02	0.03	0.04
	(0.03)	(0.03)	(0.07)
Focus	-0.04	-0.06*	0.00
	(0.03)	(0.03)	(0.08)
Observations	3627	2645	982
Adjusted R-squared	0.03	0.03	0.08
F	3.75	3.78	6.44

Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Models include school and principal characteristics.

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TABLE 1: Descriptive Statistics

Variables	N	Mean	SD	Min	Max
School characteristics					
Fraction Hispanic students	248	0.58	0.32	0.03	0.99
Fraction Black students	248	0.32	0.34	0.00	0.96
Fraction free/reduced lunch students	248	0.76	0.20	0.10	0.99
School size (in 100s)	248	9.47	6.72	0.64	42.83
2009-10 School accountability grade (F = 1…A = 5)	248	4.05	1.13	1.00	5.00
Elementary school	248	0.65	0.48	0	1.00
Middle school	248	0.19	0.39	0	1.00
High school	248	0.15	0.36	0	1.00
Combination (K-12) school	248	0.02	0.13	0	1.00
Number of assistant principals	248	1.74	0.98	0	6.00
Principal characteristics					
Female	248	0.70	0.46	0	1
American Indian	248	0.00	0.06	0	1
Black	248	0.29	0.46	0	1
Hispanic	248	0.46	0.50	0	1
White	248	0.25	0.43	0	1
Number of years in current school (top-coded at 8)	248	3.87	2.18	1.00	8.00
Age	248	49.56	7.42	34.00	70.00
Holds bachelor's degree	248	0.07	0.26	0.00	1.00
Holds master's degree or education specialist degree	248	0.70	0.46	0.00	1.00
Holds doctoral degree	248	0.22	0.41	0.00	1.00
Principal time use (percentages)					
Management	83	20.71	13.33	1.16	59.26
Administration	83	33.43	13.40	3.70	62.96
Instructional management	83	12.80	9.51	0.00	41.67
Coaching	83	0.64	1.82	0.00	10.59
Evaluation of teachers	83	1.84	4.41	0.00	21.78
Classroom observation	83	5.71	5.86	0.00	26.67
Professional development for teachers	83	0.31	1.05	0.00	7.06
Developing education programs	83	1.23	2.25	0.00	10.53
Other	83	4.86	5.02	0.00	32.14
Internal relations	83	22.25	11.56	4.35	61.36
External relations	83	4.06	5.87	0.00	37.84
Transition	83	8.63	5.85	0.00	24.18
Personal time	83	5.84	4.98	0.00	22.37
Principal location of work (percentages)					
Principal's office	83	41.32	18.47	0.00	78.05
Classroom	83	9.91	7.87	0.00	34.57
All other (e.g., main office, hallway, off-site)	83	46.45	16.73	14.81	96.30

TABLE 2: Factor Analysis of Time Management Instrument

		Four-Factor Solution (Subscales)				*Single-Factor Solution*
	Item mean	Short-range Planning	Poor Time Consciousness	Delegation	Focus	Time Management (Summary Measure)
Plan your day before you start it	3.14	0.83				0.80
Make a list of the things you have to do each day	3.09	0.82				0.66
Make a schedule of the activities you have to do on work days	3.01	0.82				0.69
Write a set of daily goals for yourself	2.65	0.76				0.64
Spend time each day planning	2.75	0.68				0.67
Have a clear idea of what you want to accomplish during the next week	3.30	0.63				0.66
Have an explicit set of goals for the current month	2.93	0.48				0.56
Find yourself continuing in unproductive routines or activities	1.82		0.79			
Find yourself being late for a meeting or event	1.42		0.74			
Find yourself working on assignments or reports the night before they are due	1.93		0.71			
Find yourself spending a lot of time transitioning from place to place	2.03		0.67			
Believe there is room for improvement in how you manage your time	2.93		0.36	0.37		
Ask your assistant principal to handle a situation so you can direct your attention elsewhere	2.72			0.81		
Delegate minor issues to an administrative assistant or other staff	2.89			0.79		0.46
Rely on an administrative assistant to screen out less important issues before they reach your desk	2.48			0.62		
Try to limit the amount of time you spend on routine paperwork	2.61			0.52	0.43	0.46
Keep your desk clear of everything other than what you are currently working on	2.28				0.59	0.59
Make the most constructive use of your time	3.10	0.42			0.59	0.69
Feel you are in charge of your own time, by and large	2.65				0.59	0.46
Find yourself getting diverted from the task at hand	2.43				-0.56	
Set and honor priorities	3.19	0.42			0.52	0.65

Items are on a 1-4 scale. Four-factor solution employs varimax rotation. Eigenvalues for these 4 factors are (in order) 5.3, 3.0, 2.1, and 1.2. Loadings lower than 0.35 not shown.

TABLE 3: Principal Time Management by Principal and School Characteristics

	Time Management (Summary Measure)	*Subscale Measures*			
		Short-range Planning	Poor Time Consciousness	Delegation	Focus
Principal characteristics					
Gender					
Male	-0.16*	-0.21**	0.00	0.18*	-0.10
Female	0.08	0.11	0.01	-0.08	0.02
Race					
Black	-0.04	0.04	0.12	-0.20	0.03
Hispanic	0.08	0.07	-0.02	0.12	-0.04
White	-0.08	-0.11	-0.10	0.02	-0.03
Highest degree					
Bachelor's degree	-0.29	-0.04	0.24	-0.06	-0.44**
MA or education specialist degree	0.09	0.10	0.01	0.06	-0.03
Doctorate	-0.14	-0.23	-0.09	-0.16	0.19
Number of years in current school					
1 - 3 years	0.04	0.16***	0.03	-0.16***	-0.09
4+ years	-0.04	-0.16	-0.03	0.20	0.06
School characteristics					
School accountability grade					
A	0.09	0.09	-0.13	0.00	-0.02
B	-0.25	-0.25	0.19	0.08	-0.09
C	0.03	0.08	0.17	0.09	-0.09
D or F	-0.16	-0.16	0.08	-0.13	0.06
School level					
Elementary	0.09**	0.12***	-0.07*	-0.05	-0.01
Middle	0.01	0.10**	0.11	0.20	-0.26*
High	-0.33	-0.44	0.27	0.11	0.09
School size					
Small (Fewer than 525)	0.12**	0.02*	0.03	-0.06	0.29**
Middle (526-1,150)	0.09**	0.18***	-0.05	-0.03	-0.12
Large (1,151+)	-0.25	-0.28	0.10	0.17	-0.12
Number of assistant principals					
0-1	0.10*	0.13**	0.00	-0.11*	0.05
2+	-0.10	-0.11	0.01	0.12	-0.10

Asterisks indicate significant differences from the final category within groupings. *p < .10. **p<.05. ***p<.01. We also tested for differences by quartiles of student free/reduced lunch eligibility and student race/ethnicity but found no significant differences (omitted for brevity).

TABLE 4: Principals' Time Allocated to Different Task Areas as a Function of Time Management Skills

	Organization management	Instructional management	Admini-stration	Internal relations	External relations	Transition time	Personal time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Time management (summary measure)	0.89	2.55**	-1.22	-4.03***	0.15	0.77	-0.67
	(1.71)	(1.04)	(1.49)	(1.30)	(0.76)	(0.64)	(0.56)
School with Grade A	1.19	-6.08	1.75	2.44	4.62	-2.11	2.36
	(5.86)	(4.25)	(5.28)	(5.30)	(3.12)	(2.68)	(2.29)
School with Grade B	4.39	-1.77	4.01	-1.84	0.94	-0.65	1.03
	(5.96)	(4.66)	(4.97)	(4.84)	(1.86)	(2.46)	(2.14)
School with Grade C	-2.31	-5.70	3.68	3.01	0.96	-1.07	0.26
	(5.03)	(3.81)	(3.40)	(4.45)	(1.62)	(1.94)	(1.66)
Fraction free/reduced lunch students	-8.45	0.36	13.21	12.00	2.53	0.21	5.49
	(11.25)	(6.76)	(10.61)	(8.40)	(5.51)	(5.64)	(4.27)
Fraction Hispanics students	-6.72	-4.98	1.62	-1.81	-0.18	-1.78	1.80
	(5.41)	(4.70)	(7.06)	(5.94)	(2.37)	(3.24)	(2.60)
School size (in 100s)	0.08	-0.03	0.33	0.25	-0.02	0.01	-0.27**
	(0.23)	(0.19)	(0.24)	(0.29)	(0.13)	(0.13)	(0.10)
Middle school	5.20	-4.48	1.12	0.32	3.57	-3.54	-1.02
	(4.02)	(3.71)	(4.54)	(4.49)	(2.81)	(2.76)	(2.01)
High school	5.47	-8.86**	-1.23	2.11	7.57*	0.04	1.28
	(4.17)	(3.41)	(4.49)	(3.91)	(4.17)	(2.30)	(1.52)
Have 2+ assistant principals	-2.05	3.73	-4.20	-2.79	-2.27	0.41	1.08
	(4.17)	(3.72)	(4.51)	(4.92)	(2.41)	(2.50)	(1.87)
Age	0.31	-0.04	-0.67***	0.23	-0.02	0.08	0.03
	(0.24)	(0.17)	(0.23)	(0.22)	(0.10)	(0.13)	(0.09)
Female	-0.36	-0.54	-4.31	1.92	1.96	-1.08	0.65
	(3.18)	(2.03)	(3.98)	(2.89)	(1.46)	(1.51)	(1.29)
Black	0.44	-1.48	6.03*	-5.50	-1.98	-0.68	-1.23
	(4.36)	(4.21)	(3.48)	(4.64)	(1.43)	(2.09)	(1.97)
Hispanic	12.64***	-0.33	-2.15	0.20	-0.32	-1.32	-1.03

	(3.61)	(2.45)	(3.69)	(3.17)	(1.85)	(2.17)	(1.57)
MA or education specialist degree	-5.17	-3.17	6.59	6.59*	1.26	-1.35	-1.90
	(5.05)	(3.64)	(4.28)	(3.40)	(1.45)	(2.06)	(1.97)
Doctorate	5.09	4.02	-0.77	-1.70	0.28	-1.70	-1.65
	(6.29)	(4.10)	(5.87)	(4.40)	(2.19)	(2.66)	(2.16)
Tenure	-1.27	0.24	0.62	-0.60	-0.13	0.25	0.70*
	(0.91)	(0.60)	(0.84)	(0.78)	(0.33)	(0.48)	(0.40)
Constant	13.40	25.71**	47.58***	-3.52	-2.13	9.35	0.08
	(16.82)	(12.12)	(14.57)	(13.83)	(6.40)	(7.60)	(6.38)
Observations	83	83	83	83	83	83	83
Adjusted R-squared	0.09	0.09	0.13	0.02	0.01	0.00	0.01
F	2.05	2.36	2.53	1.59	1.43	0.99	1.45

Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The time management measure is standardized. Time use is measured as a percentage of time spent on each category.

TABLE 5: Components of Time Management and Selected Time Allocation

	Instructional management		Internal relations	
	(1)	(2)	(3)	(4)
Short-range Planning	1.80*	1.93**	-2.45*	-2.95**
	(0.92)	(0.91)	(1.34)	(1.35)
Poor Time Consciousness	-2.40**	-2.75**	2.22	3.11*
	(0.94)	(1.04)	(1.46)	(1.59)
Delegation	0.74	1.00	-1.38	-2.06
	(1.10)	(1.15)	(1.24)	(1.31)
Focus	0.56	0.58	-1.10	-1.20
	(1.10)	(1.09)	(1.44)	(1.43)
School characteristics included	*Yes*	*Yes*	*Yes*	*Yes*
Principal characteristics included	*No*	*Yes*	*No*	*Yes*
Constant	21.71***	25.31**	15.07*	-2.97
	(7.83)	(11.29)	(8.21)	(12.45)
Observations	83	83	83	83
Adjusted R-squared	0.13	0.14	0.00	0.05
F	2.73	3.74	0.77	1.61

Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The time management measure is standardized. Time use is measured as a percentage of time spent on each category.

TABLE 6: Time Management as a Predictor of Principals' Specific Instructional Time Use

	Classroom observations	Evaluation (teacher, curriculum, program)	Coaching	Developing educational programs	Teacher PD	Other instructional tasks
	(1)	(2)	(3)	(4)	(5)	(6)
Time management (summary measure)	1.10*	0.85	0.27	0.35	-0.06	1.31**
	(0.61)	(0.60)	(0.17)	(0.25)	(0.12)	(0.61)
School with Grade A	-4.32	-2.41	0.91	-2.20**	-0.19	-2.93
	(2.73)	(2.32)	(1.33)	(1.05)	(0.47)	(2.25)
School with Grade B	-0.93	-1.16	0.35	-1.83*	0.20	-2.39
	(2.51)	(2.66)	(0.98)	(1.07)	(0.53)	(2.40)
School with Grade C	-1.29	-2.98	-0.18	-1.76*	-0.02	-4.87**
	(2.30)	(2.10)	(0.68)	(0.95)	(0.21)	(2.20)
Fraction free/reduced lunch students	-4.76	3.33	0.70	-0.16	-1.00	1.92
	(4.91)	(3.48)	(2.02)	(1.75)	(1.82)	(3.34)
Fraction Hispanics students	-0.53	-0.85	-2.26	1.19	0.37	-2.95
	(2.62)	(2.95)	(1.42)	(1.19)	(0.55)	(2.56)
School size (in 100s)	-0.14	0.04	0.04	-0.04	-0.01	0.12
	(0.09)	(0.14)	(0.04)	(0.04)	(0.02)	(0.12)
Middle school	-3.50	-2.78	0.21	-0.86	-0.55	-0.56
	(2.97)	(2.16)	(0.86)	(0.80)	(0.34)	(1.72)
High school	-5.96**	-1.58	-0.89	-0.52	-0.48	-1.81
	(2.61)	(1.53)	(0.75)	(0.84)	(0.41)	(1.84)
Constant	19.78***	3.26	-0.63	2.52	2.11	8.21
	(7.35)	(5.94)	(2.19)	(2.96)	(2.06)	(7.20)
Observations	83	83	83	83	83	83
Adjusted R-squared	0.04	0.00	0.10	0.02	0.00	0.04
F	2.48	1.34	0.75	1.26	0.51	1.69

Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The time management measure is standardized. Time use is measured as a percentage of time spent on each category. Models also include principal characteristics.

TABLE 7: Time Management and Principals' Location

Location:	Principal's office	Classroom	Other location
	(1)	(2)	(3)
Time management (summary measure)	-5.22**	1.38*	4.21**
	(2.26)	(0.78)	(1.98)
School with Grade A	15.58*	-2.69	-16.82**
	(7.80)	(3.45)	(7.28)
School with Grade B	1.14	1.56	-9.17
	(6.44)	(3.42)	(5.99)
School with Grade C	7.14	-1.12	-6.07
	(4.81)	(3.02)	(5.05)
Fraction free/reduced lunch students	17.86	1.74	-23.19
	(17.46)	(5.92)	(14.63)
Fraction Hispanics students	-19.92***	0.56	23.03***
	(7.31)	(3.40)	(7.51)
School size (in 100s)	0.82**	-0.46***	-0.42
	(0.39)	(0.14)	(0.42)
Middle school	8.13	-0.64	-6.74
	(8.11)	(3.49)	(6.84)
High school	3.94	-0.43	-0.74
	(7.82)	(2.91)	(7.33)
Have two assistant principals or more	-9.99	4.85	7.22
	(8.32)	(3.41)	(7.99)
Age	-0.04	-0.09	0.22
	(0.39)	(0.16)	(0.35)
Female	6.71	-3.13*	1.68
	(5.45)	(1.83)	(4.97)
Black	-3.94	-0.73	5.23
	(4.43)	(3.09)	(4.71)
Hispanic	4.92	-2.15	-4.41
	(6.11)	(2.33)	(4.95)
Master's or education specialist degree	3.39	1.36	-7.10
	(5.98)	(2.48)	(5.71)
Doctorate	5.18	7.44**	-14.60*
	(7.15)	(3.24)	(7.42)
Tenure	-1.54	0.15	0.31
	(1.42)	(0.58)	(1.26)
Constant	22.11	17.26*	58.85**
	(27.18)	(9.94)	(24.27)
Observations	83	83	83
Adjusted R-squared	0.00	0.12	0.00
F	1.50	2.86	1.33

Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The time management measure is standardized. Time use is measured as a percentage of time spent on each category.

TABLE 8: Principal Time Management and Job Stress

	(1)	(2)	(3)	(4)
Time management (summary measure)	-0.28***	-0.28***		
	(0.07)	(0.07)		
Short-range planning			-0.14**	-0.14**
			(0.06)	(0.06)
Poor Time Consciousness			0.35***	0.34***
			(0.06)	(0.06)
Delegation			-0.02	-0.02
			(0.06)	(0.06)
Focus			-0.26***	-0.26***
			(0.06)	(0.06)
School with Grade A	-0.04	-0.00	-0.01	0.01
	(0.26)	(0.25)	(0.23)	(0.24)
School with Grade B	-0.06	-0.02	-0.13	-0.10
	(0.33)	(0.32)	(0.29)	(0.30)
School with Grade C	0.10	0.11	-0.01	-0.02
	(0.23)	(0.23)	(0.20)	(0.20)
School with missing grades	0.03	0.08	0.05	0.07
	(0.36)	(0.37)	(0.33)	(0.34)
Fraction free/reduced lunch students	0.72**	0.50	0.66*	0.52
	(0.34)	(0.37)	(0.34)	(0.36)
Fraction Hispanics students	0.47**	0.61**	0.45**	0.56**
	(0.22)	(0.26)	(0.22)	(0.24)
School size (in 100s)	-0.01	-0.02	-0.02	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)
Middle school	0.13	0.16	0.00	0.03
	(0.21)	(0.21)	(0.19)	(0.19)
High school	0.48**	0.52**	0.43**	0.47**
	(0.22)	(0.23)	(0.21)	(0.22)
Have two assistant principals or more	-0.16	-0.20	-0.13	-0.16
	(0.18)	(0.18)	(0.17)	(0.16)
Principal characteristics included	*No*	*Yes*	*No*	*Yes*
Constant	-0.69*	0.18	-0.61	0.08
	(0.40)	(0.66)	(0.37)	(0.65)
Observations	247	247	247	247
Adjusted R-squared	0.10	0.11	0.21	0.21
F	3.83	3.28	5.56	4.52

Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 9: Time Management and Value-Added Performance in Math and Reading

	Mathematics		Reading	
	Value-Added Model 1	*Value-Added Model 2*	*Value-Added Model 1*	*Value-Added Model 2*
	(1)	(2)	(3)	(4)
Time management (summary measure)	0.009	0.021*	0.004	0.005
	(0.009)	(0.012)	(0.007)	(0.008)
Constant	0.093	0.096	0.009	0.003
	(0.080)	(0.087)	(0.062)	(0.058)
Observations	247	107	248	107
Adjusted R-squared	0.13	0.00	0.08	0.08
F	5.71	1.70	3.55	2.61

Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Models include principal characteristics. School characteristics not included because they appear in the models that create the value-added measures.

TABLE 10: Time Management and Subjective Assessment of Principals by Assistant Principals and Teachers

	Subjective assessment by assistant principals		
	(1)	(2)	(3)
	All schools	Elementary and middle school	High school
Time management (summary measure)	-0.13*	-0.25***	0.18*
	(0.07)	(0.09)	(0.09)
Observations	319	231	88
Adjusted R-squared	0.01	0.02	-0.00
F	0.94	1.22	1.98

	Subjective assessment by teachers		
	(4)	(5)	(6)
	All schools	Elementary and middle school	High school
Time management (summary measure)	0.00	-0.02	0.10**
	(0.03)	(0.03)	(0.05)
Observations	3627	2645	982
Adjusted R-squared	0.03	0.03	0.08
F	4.04	4.16	6.74

Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Models include school and principal characteristics.