Learning Accelerator Research Paper

Teaching High School Students to Manage Time: The Development of an Intervention

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Abstract

The current paper reports the results of a quasi-experimental study conducted to examine the efficacy of a new time management intervention designed for high school students. Participants were 149 students from a highly selective private high school in the northeastern United States who were in the ninth grade. Half of the students participated in a five week intervention, which involved an assessment of time management, feedback and action plans, and 5 weekly homework assignments. After the intervention, academic advisors who were blind to condition rated student time management behaviors. Ratings were higher for the treatment group than for the control group. This difference reached significance for students who began the intervention low in time management skills. Implications and suggestions for improving the intervention are discussed.

Keywords

Time management; intervention; noncognitive skills; academic performance; time management intervention; quasi-experiment; high school students; grades

Examining the Efficacy of a Time Management Intervention for High School Students

"If you want to make good use of your time, you've got to know what's most important and then give it all you've got." – Lee Iacocca

"Until we can manage TIME, we can manage nothing else." – Peter F. Drucker

1.0 Introduction

The above quotes make the point that time management skills (e.g., setting and prioritizing goals, planning ahead, organization) are necessary for success in life. It is not surprising that time management is a topic of importance to educators, researchers, and psychologists, as it relates to both academic and job performance (Liu, Rijmen, MacCann, & Roberts, 2009; Macan, 1994). Despite its growing popularity, a meta-analysis of 35 studies focusing on time management, time use, and time structure concluded that no agreed upon definition of time management exists (Claessens, van Eerde, & Rutte, 2007). One popular definition states that time management involves determining one's needs, setting goals to meet needs, and prioritizing and planning to meet goals (Lakein, 1973). Years later, a similar definition of time management surfaced with goal setting, the mechanics of time management, and organization again noted as key components (see Macan, Shahani, Dipboye, & Phillips, 1990). In the current paper and investigation, we focus on time management as the ability to meet deadlines, stay focused on the current task, have an organized workspace, set appropriate goals, plan ahead, and organize one's time and tasks (Roberts, Krause, & Suk-Lee, 2001).

1.1 Time Management and Academic Performance

There is a growing body of research that suggests time management is positively related to academic performance (see Adamson, Covic, & Lincoln, 2004; Britton & Tesser, 1991; Lahmers & Zulauf, 2000; Liu, Rijmen, MacCann, & Roberts, 2009; Macan et al., 1990; Trueman & Hartley, 1996). For example, in a study of middle school students, Liu et al. (2009) found that the time management skills of planning and organization were positively related to course grades. These relations held over time, and in fact, were stronger after six months. Further, researchers have theorized that time management strategies are important cognitive aspects of self-regulated learning that can lead to higher academic achievement (see Dembo & Eaton, 1997; Eliam & Aharon, 2003; Zimmerman & Risemberg, 1997). High achievers are more able than average or low achievers to invest their efforts and abilities into time management related self-regulatory processes, such as planning (Eliam & Aharon, 2003). Furthermore, Britton and Tesser (1991) found that both the time management skill of short-term planning and time attitudes were related to academic achievement. If the ability to effectively manage one's time is indeed positively related to academic performance, then presumably interventions that improve time management would be of value to students.

1.2 Time Management Interventions

Existing time management interventions include training in skills such as goal-setting, scheduling, prioritizing tasks, self-monitoring, problem-solving techniques, delegating and negotiating, as well as conflict resolution (Bruning & Frew, 1987; Higgins, 1986; Morisano et al., 2010; Richardson & Rothestein, 2008). Those focused specifically on time management are often centered on setting goals and priorities, the mechanics of time management (e.g., making to-do lists), and/or one's preference for organization (e.g., preference for a well-organized rather than non-organized work day; Claessens et al., 2007). Macan et al. (1990) has suggested that

time management training should lead to increases in those areas and in turn, this should lead to increased perceived control of time (Claessens et al., 2007).

However, research findings on the effectiveness of time management interventions in adults has been mixed as some research has found that time management training does not lead to differences in time management behaviors (see Briddell, 1987; Kirby, 1978; Macan, 1994, 1996; Robinson, 1974), while other research has reported that exposure to such training can lead to improved use of time and completion of tasks (see Hall & Hursh, 1982; King, Winett, & Lovett, 1986; Maher, 1986; Orpen, 1994; Woolfolk & Woolfolk, 1986). Other studies (see Green & Skinner, 2005; King et al., 1986; Macan, 1994; Slaven & Totterdell, 1993; Van Eerde, 2003) have concluded that, after training, participants were likely to engage in time management behaviors more frequently (Claessens et al., 2007). Additionally, variables such as accurately estimating time, time on important tasks, anxiety, and procrastination seem to be positively affected by time management training (Burt & Kemp, 1994; Eilam & Aharon, 2003; Francis-Smythe & Rovertson, 1999; Hall & Hursch, 1982; Van Eerde, 2003).

Research attempting to improve time management for college students has also received mixed support. Adamson et al. (2004) assessed the time management of first year college students who were exposed to a time management demonstration, a lecture on stress and coping, and given a time management manual and exercises (e.g., calendar, to-do list) after completing a survey. Students who read the manual scored significantly higher in meeting deadlines and effective organization than students that did not. Although many of these students felt that their time management skills did not improve, they still reported that time management was important to their success (Adamson et al., 2004).

Additionally, Terry and Doolittle (2008) assessed college and graduate student self-efficacy and time management skills before and after the use of a time management tool (e.g., students set goals, monitored time use, recorded time spent working toward goals, in social matters, on entertainment, and sleeping, received feedback, etc.). Although the students reported an increase in time management behaviors, there was no actual effect on self-efficacy and learning, regardless of the type of feedback they received or when they received it.

Few studies, however, have investigated the impact of time management interventions on adolescents, despite the fact that researchers (see Hattie et al., 1996) have reported that younger students gain the greatest benefits when such habits are developed early. In response, we have developed an intervention designed to improve the time management skills of high school students. Below, we first describe the intervention. Next, we report the results of a quasi-experimental study designed to investigate the efficacy of the intervention.

1.3 Current Time Management Intervention

The current time management intervention consists of several steps and is described in greater detail in the Method section. First, students' skill level on six facets of time management is assessed by having students complete the *Abbreviated Time Management Index (ATMI)* (Roberts, et al., 2001). These six facets are *Meeting Deadlines*, *Staying Focused*, *Having a Workspace*, *Setting Goals*, *Planning Ahead*, and *Organizing Time and Tasks*. Next, they are provided with feedback on three of these facets (Setting Goals, Planning Ahead, and Organizing Time & Tasks). In this feedback, students are told their skill level (e.g., "medium" or "low") on each of the three facets and are given suggestions for improving. Students are given only "medium" and "low" feedback because we reasoned that providing students with feedback suggesting that they were "high" in time management would be demotivating. These suggestions

were generated in consultation with experts in student time management (e.g., highly experienced high school teachers and guidance counselors).

Next, students discuss their assessment results and feedback in class with the school counselor, and are then provided with one homework assignment per week for the next five weeks. These assignments are designed to improve the three facets of time management that students receive feedback on and were created using theory and research from the fields of social psychology and education. After they complete each assignment, they have an in-class discussion about the assignment with the school counselor.

2.0 Current Study

The efficacy of the intervention was assessed with a quasi-experimental study. The study consisted of a treatment group, who received the intervention and a control group who participated in an unrelated intervention in addition to completing the pre- and posttests. Students were assigned to group by the researchers, who formed groups to ensure that each group consisted of an approximately equal number of students. The control group was a *focal-local* control group (Shadish & Cook, 2009). That is, in each study, the control group was in the same locale (students in the same grade level and at the same school) as the treatment group, and possessed similar characteristics on variables that were important to the study. Previous research has found that effects from randomized experiments were identical when a focal-local control group was substituted for a randomized control group (Aiken, West, Schwalm, Carroll, & Hsiung, 1998).

The outcome variable was advisor ratings of student time management behaviors. Specifically, at posttest, academic advisors (blind to condition) rated students on 27 time management behaviors. Academic advisors did not rate students at pretest because at that time they did not know the students, who were new to the school. Although this fact, in addition to the fact that true random assignment to condition was not present, might invite criticism of the advisor ratings, we feel that establishing the fact that the control group is a focal-local control group provides some evidence than any observed differences in advisor ratings are due to the intervention rather than some other confounding factor.

2.1 Method

2.2 Participants

Participants were 149 ninth grade students from a highly selective private high school in the northeastern United States. The high school is in a suburban area, enrollment is about 800 students, the acceptance rate is 19%, the student to faculty ratio is 8:1, and nearly all students attend college with a large percentage attending Ivy League or similarly selective institutions. Demographics for the sample are displayed in Table 1. There were no significant differences between groups for these factors, all *t*s < 1.20, all *p*s > .13. The ethnic composition of the groups was roughly equivalent.

Table 1

Comparison of Treatment and Control Conditions for all Subjects

	Group	
Characteristic	Treatment	Control
Sample Size	75	74
Percent Male	48.00%	53.40%
Percent White	52.00%	55.00%
Percent Asian/Asian American	26.70%	23.30%

Percent African American/Black	14.70%	9.60%
Percent Hispanic/Latino	1.30%	1.40%
Percent Other	5.30%	10.70%
Age		
M	14.00	14.04
SD	0.44	0.42
Conscientiousness		
M	75.15	74.16
SD	8.42	8.95
SSAT Total		
M	2135.55	2175.77
SD	272.93	93.82
N	73	74
Setting Goals		
M	28.16	27.33
SD	4.08	4.70
Planning Ahead		
M	23.24	23.00
SD	4.85	4.66
Organizing Time & Tasks		
M	17.55	17.04
SD	6.27	6.32

2.3 Assignment to Condition

Students were assigned to condition by class. That is, half of the English courses and half of the cultural studies courses were assigned to the treatment condition. By assigning students to condition in this way, we could ensure that the treatment and control conditions were composed of approximately equal numbers of students. This assignment method also made the most sense logistically, as it made it possible for the school counselor to discuss assessment and homework results with entire classes of students rather than requiring her to discuss results with each student individually.

2.4 Instrumentation

2.4.1 Time Management.

Time management was assessed with the *Abbreviated Time Management Index (ATMI)* (Roberts, Krause, & Suk-Lee, 2001). Based on theoretical, applied, and empirical approaches to time management, the ATMI assesses six facets of time management behaviors and attitudes. Each item was answered on a scale from 1 (*Never*) to 6 (*Always*). The basic structure of the ATMI was confirmed through exploratory and confirmatory factor analysis on a national sample of students (Ling & Rijmen, 2011).

1) Having a Workspace (6 items): This subscale measures a person's preference for being organized and keeping their workspace neat and tidy; several items pertain to the degree to which a person views messiness or disorganization as counterproductive. Example: *I keep my desk uncluttered.*

2) Meeting Deadlines (6 items): This subscale measures the extent to which people perceive themselves to be in control of time and to use their time wisely and efficiently. Example: *I leave things to the last minute* (reverse-keyed).
3) Organizing Time and Tasks (6 items): The items in this subscale assess actions, strategies, and preferred ways of behaving that are associated with successful time management practices. Example: *I write a daily to-do-list.*
4) Planning Ahead (6 items): This subscale reflects an individual's preference for structure and routine over flexibility, unpredictability, and lack of constraint. Example: *I like to leave things to chance (reverse-keyed).*
5) Setting Goals (6 items): This subscale measures an individual's sense of purpose, level of focus, and goal-setting capacity. Example: *I am driven to achieve my goals*.
6) Staying Focused (6 items): This subscale reflects an individual's potential to cope with change and their ability to adapt when change occurs. Example: *I can't cope with change* (reverse-keyed).

2.4.2 Advisor Ratings.

Academic advisors who were blind to condition rated students' time management behaviors compared to other students of the same age at the school on 27 items. Each item was answered on scales ranging from 1 (*Below Average*) to 5 (*Truly Exceptional*). A sixth point was included (Do Not Know) and was treated as missing if selected. Example items include, "*Sets clear goals for the future*," "*Is good at planning ahead*," "*Finishes schoolwork in a timely manner*," and "*Is on time for class*." Most academic advisors were full time faculty members, although some were housemasters, coaches, or administrators. Student advisors are informed of most student classroom issues (positive and negative). They monitor academic progress, or lack thereof, and meet with their advisee once a week.

2.4.3 Group Comparison Information.

Students provided their gender, race/ethnicity, age, and *Secondary School Admissions Test* (SSAT) scores (SSAT, 2011). The SSAT is used as a proxy for cognitive ability, and is a standardized multiple-choice test for students grade 5-11. It tests verbal ability, quantitative ability, and reading comprehension. For students grade 8-11, scores can range from 1500-2400. Furthermore, conscientiousness was assessed with 19 industriousness items from the *International Personality Item Pool* (IPIP; Goldberg, Johnson, Eber, et al., 2006). An example item is, "I accomplish a lot of work." Items were answered on a 5-point scale ranging from 1 ("very inaccurate") to 5 ("very accurate"). The scales of the IPIP have been demonstrated to have high internal consistency and also have strong convergent validity with other existing assessments of personality (e.g., Gow, Whiteman, Pattie, & Deary, 2005). This information was used to verify that the control group qualified as a focal-local control group. All assessments were delivered via the web.

2.5 Intervention and Study Procedure

2.5.1 Time Management Assessment.

The week before the intervention began, students in both the treatment and control conditions completed the ATMI during class time in a computer lab in the school library.

2.5.2 Categorization of Skill Level.

After time management skills were assessed their responses were compared to the responses of a national sample of 814 students of the same age. These students came from Atlanta, Chicago, Denver, Fort Lee, NJ, and Los Angeles. Students were then classified as "low" or "medium" on each of the six facets of time management. That is, students who fell below the

mean of the national sample on a facet were classified as falling in the "low" skill bucket for that facet, and those above the mean were classified as falling in the "medium" skill bucket.

2.5.3 Delivery of feedback.

After students were classified, the treatment group was provided with feedback (paper-based) on three of the facets during a class period one week after the pretest assessment was completed. As with any regular class session, attendance was required. This feedback provides them with their relative standing on each of the facets and suggestions for improving as created by an expert panel of high school teachers and guidance counselors. Feedback is slightly tailored to skill level. For example, for goal setting one "low" suggestion reads, "Remind yourself regularly of your goals. Goals are an investment in your future," whereas it reads, "Remind yourself regularly of your goals. If you find yourself spending too much time on activities that distract you from your goals, bring your focus back to your priorities for that day" in the "medium" skill category. In the current studies, treatment students received feedback only on the setting goals, planning ahead, and organizing time and task facets. This was done because of time constraints and also because the school we partnered with expressed special interest in these three facets. For the current studies, feedback was given to the students by the school counselor, who also discussed the results with them.

2.5.4 Homework.

For each of the five weeks that followed, students also completed a homework assignment. They are described in the Appendix.

2.5.5 Advisor Ratings.

One month after treatment students completed the planner assignment; academic advisors rated students on the previously described 27 behaviors related to time management.

2.5.6 Control condition.

The control condition was active in this study. Specifically, during the time the treatment group was participating in the time management intervention, the control group was participating in a "strategic reading" intervention. The intervention consisted of four tutorials, *self-evaluation of current reading practices*, *pre-reading*, *during reading*, and *post reading practice*. The students incorporated each learned skill into their homework, and they wrote brief reflective responses about their experience after each tutorial. As with any regular class session, attendance was required. The amount of time the control group spent in the strategic reading intervention was roughly equivalent to the amount of time the treatment group spent in the time management intervention.

3.0 Results

3.1 Scale Reliabilities.

Scales reliabilities were: conscientiousness ($\alpha = .87$), setting goals ($\alpha = .79$), planning ahead ($\alpha = .78$), organizing time and tasks, ($\alpha = .84$), and advisor rating ($\alpha = .99$).

3.2 Comparison of Groups.

Student conscientiousness, cognitive ability (as indexed by SSAT scores), and time management as a function of study condition is displayed in Table 1. There were no significant differences in between groups for these factors, all ts < 1.20, all ps > .13, although the difference in the time management facet Staying Focused on the Present did approach significance, with the treatment group scoring higher than the control group, $t(146) = -1.53$, $p = .13$. The ethnic composition of the groups was roughly equivalent.

3.3 Attrition Analysis.

Thirteen students from the treatment condition and ten from the control condition failed to complete the posttest assessment. The two conditions were equivalent in age, Conscientiousness, cognitive ability, and all facets of time management, all *t*s < 1.37, all *p*s > .18. This analysis suggests that the treatment and control groups remained equivalent even after students dropped out of the study.

3.4 Academic Advisor Ratings.

Ratings for 6 students were excluded because these ratings had no variance (i.e., the advisor gave the same rating for each item), suggesting lack of effort on the ratings. Ratings for the intervention group were higher than for the control group for 24 of the 27 items, although only one difference ("Is on time for class") reached statistical significance ($M_{intervention}$ = 3.28, SD = 1.12; $M_{control}$ = 2.90, SD = 1.13), $t(139) = -1.97$, $p = .05$, $d = -.34$. Because 27 items of the advisor ratings highly intercorrelated, they were averaged to create one advisor rating per participant. There was a difference for the total sample that approached, but did not reach, significance, such that advisor ratings were higher for the treatment group (M = 2.99, SD = .99) than for the control group (M = 2.77, SD = .86), $t(143) = -1.46$, $p = .15$, $d = -.24$.

We also repeated the analyses for students most in need of a time management intervention. Results from the previous analysis may be attenuated by the inclusion of students who already have good time management skills, and thus would not benefit from time management training. To counteract this, we repeated the analysis using only participants who fell in the low skill bucket on at least two of the three facets that were the focus of the intervention. A total of 65 students were included. This time, ratings for the intervention group were higher than for the control group on all 27 items, although no single difference reached statistical significance. For the average rating, advisors gave significantly higher ratings to the treatment group (M = 2.99, SD = 1.11) than to the control group (M = 2.49, SD = .70), $t(63) = -2.15$, $p = .04$, $d = -.54$.

4.0 General Discussion

Significant results for the advisor ratings provide initial support for the efficacy of the time management intervention. These results are particularly impressive when one takes into account the characteristics of the samples employed in these studies. That is, participants were students at one of the most highly selective high schools in the United States. The fact that they were already elite students coming into the study makes it likely that they started out with higher time management skills than the average student of their age. As such, many or most of these students would not be expected to be in dire need of training in time management and thus the current study represents a conservative test of the intervention. Indeed, this intervention may be much more powerful if conducted with a population of students with fewer economic and educational resources.

4.1 Limitations and Future Research

One limitation of the current research concerns uncertainty regarding treatment dosage effects. That is, it is difficult for us to ascertain how seriously each of the students took the intervention and how much effort they put into each of the homework assignments. It could certainly be the case that many of the treatment students did not take the intervention seriously, thus obscuring the true effect of the intervention as intended. Future research can avoid this problem by having students complete homework assignments in a supervised setting, such as during class time.

One unanticipated problem was that every student, including the control group, went through a 45-minute time management training session upon entering the school. It is possible

that due to this training, students in both groups entered the study with better time management skills than they would have otherwise had, thus making it more difficult to find significant effects. Furthermore, anecdotally, the counselor working with us on these studies stated that she believed that the students might not have fully appreciated the importance of the intervention because the fall ninth grade semester is graded on a pass/fail basis. There might be a benefit for future research to focus on testing the intervention with older students who might be more motivated to take the intervention seriously.

There are several additional avenues for future research that should be explored. The first would be to conduct a longitudinal study of the effects of the intervention. It is quite possible that the effects of the time management intervention will not be evident until they have had a chance to compound over time. Thus, a study employing a delayed post-test design would be informative. Yeager and Walton (2006) theorized that "small" interventions such as the one described in this paper are often surprisingly effective because they work through a recursive process. For example, time management skills learned during the intervention may allow students to study more efficiently, leading to better grades. Receiving better grades may then reinforce the value of practicing good time management, which again leads to better grades, and so forth. However, the difference in GPA between the treatment and control group may not be evident until three or four years after the actual time management intervention. This prediction is consistent with the findings of Liu et al. (2009) described in the introduction who found that the strength of the time management- grades relationship increased over time.

Another possibility for future research would be to focus on improving just one facet of time management. An intervention focused solely on setting goals, for example, might look very different than an intervention focused on organizing time and tasks. The former would teach students how to think about what they want for the future and how to get there, whereas the latter would teach students how to organize their time in the present. Although these interventions might go hand-in-hand in practice, a more effective treatment might be had by creating an intervention more narrowly focused on a single facet.

4.2 Conclusion

Returning to the quotes that opened the paper, if Lee Iacocca and Peter Drucker are correct about the importance of time management, then an intervention that has the ability to improve time management skills would be invaluable. Although the current intervention has several limitations, we feel that it represents a starting point for such an intervention. The current intervention, especially once improved, has the potential to become a useful tool in improving the quality of students' academic – and nonacademic – lives.

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6.0 Appendix

Description of Time Management Intervention Homework Assignments

Week 1: The first assignment was the "goal setting worksheet." For this assignment, students were asked to think of three goals: a school goal, an extracurricular activity goal, and a friends and family goal. For each of these, they wrote the goal down and three things they needed to do to achieve this goal. They then wrote down three things they needed to do to achieve the three things they wrote down to achieve their goal. Finally, they wrote down three things they needed to do to achieve *those* three things. So, in total, they wrote down three goals and nine steps to achieving each goal. This exercise was done to help counter one of the most prevalent time management related problems; the planning fallacy, or the fact that people underestimate the amount of time it takes to finish complex tasks (Buehler, Griffin, & Ross, 1994). One way to counter the planning fallacy and get people to more accurately estimate task completion times is to have them "unpack" tasks into smaller units (Kruger & Evans, 2004). After listing three things they needed to do to achieve a goal, they further broke each of these tasks into additional activities. Finally, they wrote down the day that they would complete the first task.

Week 2: The second assignment was the "goal construal exercise." It was intended to build upon the week one (goal setting) exercise and also to help students construe their goals in a high level (e.g., abstract, decontextualized) manner. Previous experimental research has demonstrated that students primed to construe a task in a high-level manner found it easier to resist temptation when beginning goal pursuit than students not primed to construe a task in a high-level manner (e.g., Fujita, Liberman, & Levin-Sagi, 2006). In this exercise, students write down the three goals they generated for the goal setting worksheet. They then list 3 reasons for why they would like to meet this particular goal. Additional questions, such as, "What good will come of you achieving this goal?" and "What will achieving this goal mean for your life?" were asked to encourage students to think about how meeting this goal would impact them and their life. Previous research has demonstrated that answering questions of this type about an event has the effect of leading one to construe the event in a high level manner (Burrus & Roese, 2006).

Week 3: For the third assignment, students completed a modified version of the day reconstruction exercise (e.g., Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004). This five-part assignment required students to provide an hourly view of what they did yesterday, who they did it with, and how they felt while participating in a particular activity. Additionally, information about their overall mood yesterday and how they believed others perceive them was also collected. Finally, the last part of the assignment required them to reflect on the number of hours they spent doing each activity, who they spent time with, and how they felt. Students were prompted to note anything that surprised them as they looked for trends in their information.

Week 4: For the new week four assignment, students completed a true-false time management quiz. An example item is, "As you begin to think about your goals, it is a good idea to discuss your future goals in detail with your family" (answer is true). We included this exercise because recent research has demonstrated that the practice of retrieving information has just as large, or larger, of an effect on learning as does studying (e.g., Karpicke & Roediger, 2008). As such, we hypothesized that an additional quiz would create an additional opportunity to retrieve information, and thus greater learning of information related to time management.

Week 5: The final assignment involved teaching students how to use a planner and having them complete a sample planner. Included in the planner were a weekly schedule, monthly schedule, and to-do list. In addition to their pragmatic value, the week four and five homework tools can help to correct any false beliefs students might have about their ability to control the

way they manage their time. Plant, Ericsson, Hill, and Asberg (2005) have noted that, in their sample of college students, an organized and systematic approach to planning was associated with higher GPAs.