The assessment of time management in middle-school students

Ou Lydia Liu *, Frank Rijmen, Carolyn MacCann, Richard Roberts

Educational Testing Service, 666 Rosedale Road, MS16-R, Princeton, NJ 08541, United States

ARTICLE INFO

ABSTRACT

A self-assessment of time management is developed for middle-school students. A sample of entering seventh-graders ($N = 814$) from five states across the USA completed this instrument, with 340 students retested 6 months later. Exploratory and confirmatory factor analysis suggested two factors (i.e., Meeting Deadlines and Planning) that adequately explain the variance in time management for this age group. Scales show evidence of reliability and validity; with high internal consistency, reasonable consistency of factor structure over time, moderate to high correlations with Conscientiousness, low correlations with the remaining four personality dimensions of the Big Five, and reasonable prediction of students' grades. Females score significantly higher on both factors of time management, with gender differences in Meeting Deadlines (but not Planning) mediated by Conscientiousness. Potential applications of the instrument for evaluation, diagnosis, and remediation in educational settings are discussed.

1. The assessment of time management in middle-school students

In our technologically enriched society, individuals are constantly required to multitask, prioritize, and work against deadlines in a timely fashion (Orlikowsky & Yates, 2002). Time management has caught the attention of educational researchers, industrial organizational psychologists, and entrepreneurs, for its possible impact on academic achievement, job performance, and quality of life (Macan, 1994). However, research on time management has not kept pace with this enthusiasm, with extant investigations suffering from a number of problems. Claessens, Van Eerde, Rutte, and Roe's (2007) review of the literature suggest that there are three major limitations to research on time management. First, many measures of time management have limited validity evidence. Second, many studies rely solely on one-shot self-report assessment, such that evidence for a scale's generalizability over time cannot be collected. Third, school (i.e., K-12) populations have largely been ignored. For example, all studies in the Claessens et al. (2007) review focus on adult workplace samples (e.g., teachers, engineers) or university students, rather than students in K-12.

The current study involves the development of a time management assessment tailored specifically to middle-school students (i.e., adolescents in the sixth to eighth grade of schooling). Time management may be particularly important at the onset of adolescence for three reasons. First, the possibility of early identification

and remediation of poor time management practices. Second, the transition into secondary education, from a learning environment involving one teacher to one of time-tabled classes for different subjects with different teachers setting assignments and tests that may occur contiguously. Successfully navigating this new learning environment requires the development of time management skills. Third, adolescents use large amounts of their discretionary time on television, computer gaming, internet use, and sports: Average estimates are $3\frac{1}{4}$ and $2\frac{1}{4}$ h per day for seventh-grade boys and girls, respectively (Van den Bulck, 2004). With less time left to do more administratively complex schoolwork, adolescents clearly require time management skills to succeed academically.

1.1. Definitions and assessments of time management

Time management has been defined and operationalized in several different ways: As a means for monitoring and controlling time, as setting goals in life and keeping track of time use, as prioritizing goals and generating tasks from the goals, and as the perception of a more structured and purposive life (e.g., Bond & Feather, 1988; Britton & Tesser, 1991; Burt & Kemp, 1994; Eilam & Aharon, 2003). The various definitions all converge on the same essential element: The completion of tasks within an expected timeframe while maintaining outcome quality, through mechanisms such as planning, organizing, prioritizing, or multitasking. To the same effect, Claessens et al. (2007) defined time management as "behaviors that aim at achieving an effective use of time while performing certain goal-directed activities" (p. 36).

Four instruments have been used to assess time management in adults: The Time Management Behavior Scale (TMBS;

* Corresponding author. Tel.: +1 609 734 1049.
E-mail address: lliu@ets.org (O.L. Liu).

Macan, Shahani, Dipboye, & Philips, 1990), the Time Structure Questionnaire (TSQ; Bond & Feather, 1988), the Time Management Questionnaire (TMQ; Britton & Tesser, 1991), and the Australian Time Organization and Management Scales (ATOMS, Roberts, Krause, & Suk-Lee, 2001). Structural analysis of the TMBS suggested three factors of time management: Setting goals and priorities, mechanics of time management (e.g., use of tools such as planners), and preference for organization (Macan, 1994). The TSQ has five factors (sense of purpose, structured routine, present orientation, effective organization, and persistence [Bond & Feather, 1988]), the TMQ three (short range planning, time attitudes, and long range planning, [Britton & Tesser, 1991]), and the ATOMS six (sense of purpose, meeting deadlines, mechanics of time management, coping with temporal flow, planning, and organization).

Although these measures show acceptable psychometric properties, they have been criticized for being excessively lengthy, which may be of particular concern in younger age groups (Macan, 1994; Macan et al., 1990). In addition, item content is frequently not transferable to younger age groups (e.g., items refer specifically to work-related content, or are semantically complex). For these reasons, the development of a short assessment of time management appropriate for adolescents is an important advance for the field, allowing the examination of time management-achievement links in early adolescence. The theoretical framework for the instrument developed in this study builds on these existing theories of time management, including content areas judged to be relevant to middle-school students.

1.2. Relationships of time management with academic achievement

In general, studies report that time management exerts a positive influence on student learning outcomes (Claessens et al., 2007). For example, college GPA is significantly correlated with time use and can be predicted by planning and time attitudes (Britton & Tesser, 1991; Kelly, 2002). However, few studies examine how time management relates to academic achievement in the pre-college years. The demands of the transition to secondary education coupled with the adolescents' tendency to spend large amounts of time on television and other activities suggest that time management might play a key role in academic achievement in the early teens. For this reason, the current study examines the time management-achievement link in seventh-graders. In addition, we consider the relationship of time management to a cognitive ability test (vocabulary) to test whether the time management-achievement link is due to time management practices, or occurs simply because students with good time management skills tend to be smarter.

1.3. Objectives of this study

The primary purpose of this study was to develop an appropriate instrument for time management to be used in an adolescent sample, in order to: (a) determine the structure and correlates of time management in this age group, and (b) examine the relationship between time management and academic achievement. Evidence for the reliability of the assessment is considered in terms of a replicable structure of time management, internally-consistent scales, and test–retest reliability of scale scores. Evidence for the assessment's test-criterion validity will be evaluated against students' school grades. Evidence for the assessments' construct validity is considered to be the independence from conceptually dissimilar constructs of vocabulary and certain aspects of personality (Extraversion, Agreeableness, Neuroticism, and Openness) and relationship with conceptually similar constructs (Conscientiousness, which includes facets of Order and Delibera-

tion conceptually similar to Organization and Planning, Costa & McCrae, 1995).

2. Method

2.1. Participants

Participants were 814 (414 Female) students, parent-identified as about to enter the seventh grade at the time of testing. Participants were located in five cities across the US: Los Angeles, Denver, Atlanta, Chicago, and Fort Lee. Students' mean age was 12.00 (SD = 0.46). The ethnic composition of the sample was White Non-Hispanic and others (60.5%), African American (18.8%), and Hispanic (20.7%).

2.2. Procedure

Data were collected over two time points, approximately 6 months apart. All students participated in the study at Time 1, and a subset of 340 students (47.1% female) participated at Time 2. Those students who completed at both Time 1 and 2 are part of an ongoing longitudinal study being conducted at ETS, where (owing to the study design) participants are sampled every 6 months.

Time 1. Students completed a self-paced, proctored computerized test battery of measures over a 2-week period in August during the summer break from school. Participants were tested at a local testing site and compensated for their time. The test battery generally took between 1.5 and 2 h to complete. This test battery included the time management measures, student self-reported grades in major subjects, a personality measure, a vocabulary test, and a brief demographic questionnaire. Students were informed that there were no right or wrong answers and were encouraged to endorse the statement that best described themselves.

Time 2. The second subset of students completed a second proctored, computerized test battery 6 months later. Testing took place over two weekends in February at the same testing sites. The test battery at Time 2 included a reduced form of the time management measure (i.e., unreliable items had been removed after analysis of Time 1 data), and student self-report grades in major subjects. The ethnic composition of the sample at Time 2 was: 66.8% White Non-Hispanic and other, 18.1% African American, and 14.4% Hispanic.

2.3. Instruments

2.3.1. Time management

Thirty-two time management items were downward extended from existing time management indexes for adults, often by embedding items in situations appropriate for middle-school students. These items were in four domains, with 8 items each: planning (e.g., *I change my plans all the time*), meeting deadlines (e.g., *I complete my homework on time*), effective organization (e.g., *I clean up my bedroom before I leave for school*), and mechanics of time management (e.g., *I like to make lists of things to do*). Nine items were reverse-keyed. Items were rated on a five-point Likert scale, from "Never" to "Always".

2.3.2. International Personality Item Pool Collaboratory Five Factor Personality Measure (IPIP; Goldberg et al., 2006)

Sixty items taken from the IPIP protocol were used to measure students' personality. Participants rated their agreement on a 5-point scale ranging from (1) "Very Incorrect" to (5) "Very Correct." Example items include: *I am usually active and full of energy* (Extraversion), *I trust what other people say* (Agreeableness), *I cry easily* (Neuroticism), *I need things to be arranged in a particular order* (Conscientiousness), and *I like to learn new things* (Openness).