

College Students' Time Management: Correlations With Academic Performance and Stress

Therese Hoff Macan
University of Missouri—St. Louis

Comila Shahani
Hofstra University

Robert L. Dipboye and Amanda Peek Phillips
Rice University

Many college students may find the academic experience very stressful (Swick, 1987). One potential coping strategy frequently offered by university counseling services is time management. One hundred and sixty-five students completed a questionnaire assessing their time management behaviors and attitudes, stress, and self-perceptions of performance and grade point average. The study revealed 2 major findings. The Time Management Behavior Scale consists of 4 relatively independent factors; the most predictive was Perceived Control of Time. Students who perceived control of their time reported significantly greater evaluations of their performance, greater work and life satisfaction, less role ambiguity, less role overload, and fewer job-induced and somatic tensions. Findings are consistent with theory and advice on time management (e.g., Schuler, 1979) but also indicate that the dynamics of time management are more complex than previously believed.

In trying to read all the books and chapters assigned, meet paper deadlines, and participate in extracurricular activities, college students may become overwhelmed with feelings that there is not enough time to complete all their work adequately. This seems particularly true of students who hold part-time or full-time jobs as well as attend school. Poor time management behaviors, such as not allocating time properly or last-minute cramming for exams, have been frequently discussed as a source of stress and poor academic performance (Gall, 1988; Longman & Atkinson, 1988; Walter & Siebert, 1981). As reasonable as these expectations are, only a few empirical studies have attempted to test these relationships. In an effort to correct this deficiency, we designed our study to assess relationships of students' time management to self-reported academic performance and various affective measures of stress.

Numerous articles and books, such as Lakein's (1973) *How to Get Control of Your Time and Your Life*, have been written on time management, but the advice on managing time seems quite consistent across the various authors. The basic recommendations are to identify needs and wants, rank them in regard to their importance or priority, and then allocate time and resources accordingly. Other tips include: Try to handle each piece of paper only once, delegate work, and continually ask yourself "What is the best use of my time right now?" Of the limited research that has dealt with time management, most studies have focused on the effects of different types of instruction on perceived stress and behavior. Although this previous research suffers from methodological flaws, the findings seem to indicate that training can change how one spends time. For instance, Hanel (1981) tested the effectiveness of a

self-instruction time management manual with a managerial staff. He found that subjects and their co-workers reported more time management behaviors after instruction, but that daily time logs revealed little change in these behaviors. Hall and Hirsch (1982) found an increase in self-reported time spent on "high-priority" tasks (i.e., writing articles or completing current projects) after participants read a time management manual. King, Winett, and Lovett (1986) found that working wives who participated in time management training received both immediate and long term benefits. Subjects showed significantly greater increases in their knowledge of time and stress management factors, spent more time in a self-determined, stress-reducing, enjoyable activity (i.e., reading a book or exercising), and reported a greater amount of self-efficacy for time and stress management-related behaviors.

Perhaps training by means of a manual or seminar can change time spent on certain activities, but it is not clear that training reduces stress or improves overall performance. King, Winett, and Lovett (1986) found that neither of the two global stress measures showed reliable differential change across conditions after the interventions. Bost (1984) examined the effects of time management training in a peer counseling format for freshmen on academic probation and found no statistical differences in grade point averages (GPA) among the four time management treatment groups.

The research so far has dealt with time management *training* aimed at changing what is assumed to be a unidimensional construct of good time management. Not only has the assumption that time management is unidimensional been untested, but there have been no systematic attempts to develop a psychometrically sound measure to assess conventional time management behaviors. Moreover, little is known about the correlation of naturally occurring time management with personality and indicators of stress and performance. Before additional research is conducted to determine the

Correspondence concerning this article should be addressed to Therese Hoff Macan, Department of Psychology, University of Missouri, 8001 Natural Bridge Road, St. Louis, Missouri 63121-4499.

effectiveness of different types of time management training, it is important to assess whether there are correlational relationships between time management and the various outcome measures these time management programs are intended to modify.

As the initial step in the present study, we developed a measure of time management behaviors. In the past, researchers have tried to measure various time-related constructs, but we could find no psychometrically sound measure of time management per se. For example, Bond and Feather (1988), in their research on the psychological effects of unemployment, developed the Time Structure Questionnaire (TSQ) to assess "the degree to which individuals perceive their use of time to be structured and purposive" (Feather & Bond, 1983, p. 321). Using university student samples, they found that those who reported more purpose and structure to their time also reported psychological well-being, optimism about the future, more efficient study habits, fewer physical symptoms, and less depression and hopelessness, among other positive tendencies. The TSQ does not, however, measure traditional time management behaviors, but instead assesses purpose and structure using global items (i.e., "Do you often feel that your life is aimless, with no definite purpose?"; "Do you have a daily routine that you follow?"). Similarly, Jordan and Bird (1989) have developed the Future Perspective Scale (FPT), which assesses a person's thoughts and feelings about future events (i.e., "I get depressed when I think of my future"; "My future will be an extremely busy time"). The rationale behind this future perspective approach is that one's views and feelings about the future may affect how one behaves in the present. Like the TSQ, the FPT does not measure traditional time management behaviors.

In contrast with these previous attempts, we designed the present instrument to assess the behaviors critical to the construct of time management as defined in the popular literature. The objectives of this study were twofold. First, we examined the dimensionality of conventional time management behaviors. Our second objective was to examine the correlates of time management behavior, which, as indicated earlier, have been largely neglected in past research (Bluedorn & Denhardt, 1988). We drew several a priori hypotheses from the stress literature that portrays time management as a way to lower stress and gain greater efficiency, satisfaction, and health (Schuler, 1979). On the basis of these claims, we hypothesized a positive relationship between self-reported time management behaviors of students and their performance, as reflected in both self-reported GPA and quality of performance. Specifically, students who reported more frequent use of time management were expected to show higher levels of performance. In regard to other variables that may be related to stress, we hypothesized a negative relationship between time management behaviors and role ambiguity, role overload, job tension, and somatic tension. A person engaging more frequently in time management behaviors should not only experience low role ambiguity and low role overload, but should also report lower job tension and fewer physical symptoms of stress such as headaches and ulcers. A positive relationship was hypothesized between time management behaviors and several satisfaction scales such that students en-

gaging in time management would experience greater satisfaction with work and life. All the above hypotheses are based on previous theorizing and speculations in the stress and time management literature. One last issue was exploratory in nature. We examined the relationship of the Type A-B personality dimension to time management. Although no a priori hypotheses were set forth for this variable, the Type A-B behavior pattern was included because it has been linked to both performance effectiveness and unfavorable health outcomes (Ivancevich & Ganster, 1987). Moreover, Type A's have been characterized as having a component of time-pressured behavior.

To test the hypotheses, we conducted a correlational field study in which students were surveyed as to their time management and the aforementioned outcome variables. No attempt was made to test the causal relations implied in the hypotheses. Instead, in this early stage of the research, we believed it was important to assess correlational relationships prior to conducting experimental research.

Method

Development of Time Management Behavior Scale (TMB)

We created 76 questionnaire items from a compilation of tips, ideas, and techniques repeated throughout several how-to books on time management. The items were constructed to cover topic areas in time management that included the following: setting goals and priorities, learning to say "no," making a things-to-do list, organizing, planning, delegating, and procrastinating. Some items were taken directly from the appendix of these self-help books. The items were developed to measure the extent to which time management behaviors were used, not the individual's evaluation of the effectiveness or appropriateness of such behaviors.

In developing the scale, 123 undergraduate students' responses to all 76 items were subjected to an item analysis. All redundant and noncontributing items (item-total correlations less than .29) were removed, resulting in the 46-item TMB used in this study.

To examine the dimensionality of the scale, we had an additional 165 subjects complete the 46-item Time Management Behavior questionnaire. Factor analyses on these two samples separately resulted in similar factor structures. Therefore, a total of 288 subjects' responses to the 46 items were subjected to a common factor analysis with squared multiple correlations in the diagonals. The factors were rotated using a Harris-Kaiser orthoblique rotation (Gorsuch, 1983). Four factors were retained that accounted for 72% of the common variance. The four factors were labeled as: Factor 1—Setting Goals and Priorities (eigenvalue = 7.04); Factor 2—Mechanics—Planning, Scheduling (making lists, planning, scheduling; eigenvalue = 2.58); Factor 3—Perceived Control of Time (eigenvalue = 2.08); Factor 4—Preference for Disorganization (eigenvalue = 1.26). Factor 1 includes items that tap the setting of goals the person wants or needs to accomplish and prioritizing of the various tasks to achieve these goals. Factor 2 refers to the behaviors typically associated with managing time, such as making lists and planning. The items making up Factor 3 reflect the extent to which one believes he or she can affect how time is spent. The last interpretable factor, Factor 4, refers to a general preference for disorganization in one's workspace and approach to projects. The items in Factor 4 were reverse-scored so that higher scores on this factor indicate a preference for organization. The TMB is available from Therese Hoff Macan on request.

Interfactor correlations on the four factors ranged from .10 to .24, and revealed that none of the factors were significantly correlated with each other. It appears as though the construct of time management is not unidimensional, but consists of several relatively independent factors. The factor structure is presented in Table 1. Factor 1 is composed of 15 items, Factor 2 and Factor 3 are each made up of 13 items, and Factor 4 is composed of 5 items.

Subjects

The survey packets that were administered differed between two samples in that 123 subjects (all undergraduates participating for extra course credit) completed the TMB only. Therefore, of the 288 students providing data for the factor analysis, 165 completed additional scales used in testing the hypotheses. Of the subjects, 213 were

undergraduate students who participated for extra course credit, 51 were Masters of Business Administration (MBA) students who completed the survey as part of an in-class demonstration, and 24 were full-time teachers taking summer-school courses in the Department of Education at a large state university.

Specific demographic information was available only for the 165 subjects completing the longer survey of measures. The mean age for the subject sample who provided this information ($n = 162$) was 24.77, with a range of 16 to 44 years. Of the 157 subjects for whom information on race or ethnic status was available, 116 were White; 12 were Black, 9 were Hispanic, and 20 were Asian. One hundred thirty-four subjects (81 women and 53 men) provided information on their sex. Data on marital status were available for 120 subjects, of which 76 were single, 35 married, and 9 divorced. The remaining 123 undergraduate subjects for which demographic information was not available were believed to be similar to those undergraduates

Table 1
Factor Structure Correlations

Item	Factor 1	Factor 2	Factor 3	Factor 4
17—Breaks down tasks	62	17	13	4
16—Reviews goals	58	9	14	7
22—Reviews activities	60	25	-8	26
19—Sets deadlines	60	22	19	14
20—Increases task efficiency	54	11	6	10
15—Keeps long-term goals	53	10	12	2
18—Sets short-term goals	55	26	18	17
23—Evaluates daily schedule	56	29	13	23
21—Completes priority tasks	48	14	14	7
24—Sets priorities	53	24	17	38
44—Uses waiting time	44	33	2	26
7—Handles letters & memos	38	20	13	6
37—Sorts mail daily	35	33	23	7
43—Avoids interruptions	30	16	6	18
28—Schedules time daily	33	33	2	25
31—Makes list of things to do	20	71	12	20
32—Carries appt. book	16	64	0	9
29—Writes reminder notes	25	68	9	29
33—Keeps daily log	4	59	-3	9
25—Carries notebook	29	63	16	10
26—Schedules events weekly	28	52	7	18
36—Days too unpredictable	6	44	19	33
27—Recordkeeping	32	45	4	16
34—Scheduling is wasted time	13	36	15	19
30—Forgets about lists made	22	39	28	30
35—Sets out clothes nightly	22	33	9	17
39—Organizes paperwork	23	32	6	21
9—Leaves clean workspace	28	32	19	29
2—Overwhelmed by tasks	8	5	65	11
11—Involved in small details	13	8	62	0
1—Takes on too many tasks	-4	-3	55	7
3—Underestimates time	18	6	53	2
8—Unimportant tasks	13	6	48	7
12—Can't keep schedule	11	22	48	21
6—Unable to say no	9	9	44	13
4—Feels in control of time	29	8	44	8
10—Socializes at work often	10	7	40	12
42—Acts before thinks	20	13	39	23
14—Procrastinates	24	16	40	29
38—Loses sight of objectives	16	20	36	21
5—Doesn't delegate tasks	-9	3	25	-3
41—Disorganized	14	9	6	65
40—Disorganized	14	19	11	65
13—Messy workspace	12	20	8	46
45—Doesn't preplan tasks	3	23	11	40
46—Doesn't prioritize tasks	8	23	8	32

Note. Factor 1 = Setting Goals and Priorities; Factor 2 = Mechanics—Planning, Scheduling; Factor 3 = Perceived Control of Time; Factor 4 = Preference for Disorganization. $N = 288$.

providing demographic information. Both of the undergraduate groups were enrolled in psychology courses and were sampled from the highly homogeneous student body at the same university.

Procedure

Subjects completed a survey asking about their experiences in school or work. If subjects reported that they were employed full-time ($n = 35$), we coded them as spending 100% of their time in employment to denote their primary activity and asked them to respond to the items with respect to their job. If subjects were not employed full-time, we asked them to state the percentage of time they spent on school, housework, and employment activities over an average week, totaling 100%. Then, subjects answered the questionnaire with respect to the activity (school, housework, or employment) to which they had assigned the highest percentage value. The mean percentage of time subjects reported spending on school activities was 47.04 ($SD = 35.5$, range = 5–100); on housework activities, 10.21 ($SD = 12.30$, range = 0–75), and on employment activities, 34.98 ($SD = 39.24$, range = 0–100).

Subjects completed the 46-item TMB by rating each statement on a five-point Likert-type scale that ranged from *seldom true* (0) to *very often true* (4). Negatively worded items were reverse-scored so that responses on the upper ends of the scale indicated more frequent use of time management behaviors as prescribed by the literature. Therefore, scores on the TMB could range from 0 to 184. In addition to completing the time management questionnaire, 165 subjects also completed seven scales thought to be related to stress: role ambiguity, role overload, job tension, somatic tension, job satisfaction, life satisfaction and Type A–B behavior pattern. All seven scales have established reliability and validity and are frequently used (Cook, Hepworth, Wall, & Warr, 1981; Matthews, 1982). Slight changes made to a few of the scales to fit our sample are outlined below.

Role ambiguity. The role ambiguity scale was adopted from Rizzo, House, and Lirtzman (1970). The six-item scale was developed to measure role ambiguity as defined in terms of the predictability of the outcomes of one's behavior and the existence of environmental guidelines to provide knowledge that one is behaving appropriately. Scores could range from 0 to 24, with higher scores indicating more role ambiguity. The interitem reliability coefficient was 0.74, using Cronbach's (1951) alpha.

Role overload. The role overload scale was adopted from Beehr, Walsh, and Tabler (1976), who defined role overload as having too much work to do in the time available. Their three-item scale typically yielded an internal reliability coefficient of 0.56. We added one additional item to the scale that we hypothesized would measure role overload ("I feel that I just don't have time to take an occasional break"), resulting in a interitem reliability coefficient of 0.68. Scores could range from 0 to 16, with higher scores indicating a perception of greater role overload.

Job-induced and somatic tension. Two components of the anxiety stress questionnaire developed by House and Rizzo (1972) were included. The job-induced tension scale (coefficient alpha = 0.82) is composed of seven items and the somatic tension scale (coefficient alpha = 0.74) is made up of five items. These scales were designed "to measure the existence of tensions and pressures growing out of work requirements, including the possible outcomes in terms of physical symptoms" (p. 481). Scores on the job tension scale could range from 0 to 28, and scores on the somatic tension scale could range from 0 to 20. Higher scores on both scales indicated an experience of greater tension.

Satisfaction. Two separate satisfaction measures were developed to assess job and life satisfaction. We selected a subset of items from the home and employment role scales by Parry and Warr (1980) to

make up the job measure. The items had to be reworded to fit our student sample because the home and employment scales were originally designed to assess mothers' attitudes toward paid employment. The second measure, life satisfaction, was taken from work by Kornhauser (1965).

Five items made up the job satisfaction scale (coefficient alpha = 0.75), which asked how people felt about their work (Parry & Warr, 1980). Scores could range from 0 to 20, with higher scores indicating greater job satisfaction. For the life satisfaction scale, two items measured people's overall satisfaction with their life (Kornhauser, 1965). Scores could range from 0 to 8 with higher scores indicating greater life satisfaction. The interitem reliability estimate was 0.85.

Type A–B behavior pattern. The 21 items of Form C of the Jenkins Activity Survey (JAS) were included in the survey. This scale was developed by Jenkins, Rosenman, and Zyzanski (1965) to measure the extent to which a person's behavior fits the Type A Behavioral Pattern. Type As are characterized by excessive aggression, hurriedness and competition, all of which are manifestations of a struggle to overcome environmental demands or obstacles. People exhibiting the opposite behavioral pattern (i.e., relaxed, unhurried, "mellow") are characterized as Type B (Rosenman, 1978). Unit weighted scoring of the items was used, with a 1 assigned to Type A responses and a 0 to Type B responses (Krantz, Glass, & Snyder, 1974), resulting in Type A–B behavior scores ranging from 0 to 21. The mean for this scale was 11.85 ($SD = 2.76$, range = 3–18). The coefficient alpha (KR-20) was 0.59.

Performance. Subjects were asked to provide two self-reported indications of their academic performance: self-reported grade point average (GPA) and self-reported performance ratings. For self-reported GPA, subjects were simply asked to record their GPA. The mean GPA in this study was 3.23 ($SD = 0.55$, range = 1.5–4.0). For the self-reported performance ratings, subjects were asked to evaluate their own performance and their performance as compared to other students on 7-point Likert scales ranging from *very poor* (1) to *very good* (7). Scores on these two items were added together to form a composite performance measure. The mean for this scale was 10.15 ($SD = 2.25$, range = 2–14) and the interitem reliability was 0.89.

In addition, 165 subjects provided biographic and demographic information: sex, age, race, marital status, and their academic major. If subjects held a job in addition to school, they were requested to list their job title. Subjects also were asked whether they had attended any seminars or read any books on time management. Finally, subjects indicated whether they characterized themselves as a morning, night, or "neither" type of person.

Results

Descriptive Statistics

The items composing each scale were summed. The overall TMB score is a sum of all 46 items. Means, standard deviations, actual range of observed scores, and coefficient alphas were computed for all scales and can be found in Table 2. The interitem reliabilities for each of the TMB factors and overall TMB score were: .83, Factor 1; .62, Factor 2; .69, Factor 3; .60, Factor 4; and .68, overall TMB score. These reliabilities indicate moderate internal consistency for the scales. For the most part, moderate internal consistency estimates were also found for the other variables used in the study (e.g., satisfaction, tensions). The interitem reliabilities for these variables ranged from .59 to .89.

Table 2
Descriptive Statistics for Time Management Behavior Scale (TMB) and All Other Scales

Scale	M	Number of items	SD	Range	Coefficient alpha
TMB					
Overall TMB	106.37	46	22.12	49-155	0.68
Factor 1	36.85	15	9.81	4-57	0.83
Factor 2	25.66	13	9.79	4-48	0.62
Factor 3	30.30	13	7.67	8-49	0.69
Factor 4	13.25	5	4.17	3-20	0.60
Outcome measures					
Performance rating	10.15	2	2.25	2-14	0.89
Grade point average	3.23	1	0.55	1.5-4.0	—
Role ambiguity	16.44	6	4.08	1-24	0.74
Role overload	6.91	4	3.74	0-16	0.68
Job-induced tension	13.68	7	6.32	0-28	0.82
Somatic tension	5.79	5	4.19	0-20	0.74
Job satisfaction	15.19	5	3.85	2-20	0.75
Life satisfaction	4.79	2	1.91	0-8	0.85
Demographic & background variables					
Age (years)	24.77	1	5.98	16-44	—
Sex ^b	1.39	1	0.49	1-2	—
Type A/B	11.85	21	2.76	0-21	0.59 ^a
Time management seminar ^c	1.79	1	0.41	1-2	—
Read time management books ^c	1.71	1	0.46	1-2	—
Internal prime time ^d	2.13	1	0.87	1-3	—

Note. Factor 1 = Setting Goals and Priorities; Factor 2 = Mechanics—Planning, Scheduling; Factor 3 = Perceived Control of Time; Factor 4 = Preference for Disorganization. Dashes indicate not applicable.

^a Kuder-Richardson-20. ^b 1 = men; 2 = women. ^c 1 = yes; 2 = no. ^d 1 = morning; 2 = neither; 3 = night.

Correlations Between Time Management Behavior Scale and Outcome Variables

The correlations between the overall TMB score and the outcome variables examined in this study (affective measures of stress and performance) are presented in Table 3. However, the TMB was found to be multidimensional. Therefore, the correlations between the four factors and each scale were computed to provide more detailed information about the time management behaviors and are reported in Table 3.

The overall TMB score significantly correlated with six scales. The total TMB score was found to be significantly correlated with role ambiguity, somatic tension, job and life satisfaction, self-rated performance, and GPA. Higher scores on the time management behaviors overall were associated with subjects perceiving themselves as having less ambiguity concerning their role, less somatic tension, greater satisfaction with their job and life, and higher self-reported performance, measured both qualitatively by perceptions and quantitatively by GPA.

Table 3
Correlations Among Outcome Measures and Time Management for Each Factor and Overall

Measure	Overall TMB score	Factor 1	Factor 2	Factor 3	Factor 4	R ²	F overall	
							F	df
Performance rating	0.32**	0.21*	0.21*	0.37***	0.12	.15	6.80**	4, 156
Grade point average	0.23*	0.10	0.20*	0.22***	0.17*	.08	2.89*	4, 131
Role ambiguity	-0.47**	-0.55***	-0.27*	-0.27*	-0.16*	.30	16.80**	4, 158
Role overload	-0.12	0.05	-0.05	-0.35***	0.01	.16	7.44**	4, 157
Job-induced tension	-0.12	0.04	-0.02	-0.36***	-0.02	.16	7.27**	4, 158
Somatic tension	-0.26*	-0.01	-0.10	-0.45***	-0.22*	.25	13.35**	4, 158
Job satisfaction	0.26*	0.15	0.14	0.32***	-0.11	.11	4.99*	4, 158
Life satisfaction	0.23*	0.04	0.17*	0.31***	0.11	.12	5.49**	4, 158

Note. TMB = Time Management Behavior Scale; Factor 1 = Setting Goals and Priorities; Factor 2 = Mechanics—Planning, Scheduling; Factor 3 = Perceived Control of Time; Factor 4 = Preference for Disorganization.

^a Based on standard multiple regression analyses, this factor was found to significantly ($p < .01$) predict the corresponding dependent variable, above that contributed by the other factors.

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

Results of the factor analysis, however, showed the scale to consist of four factors, not a unitary factor as we thought when developing the scale. Looking more closely at the correlations of the outcome variables with each factor (see Table 3), we identified Factor 3 (Perceived Control of Time) as the major correlate. Factor 3 (Perceived Control of Time) was significantly correlated with all eight outcome variables. As subjects perceived that they had more control over their time, perceived role ambiguity and role overload as well as job and somatic tensions decreased. Subjects reported greater satisfaction with their life and job roles as scores on Factor 3 increased. Increased scores on this factor were also associated with higher self-reported performance and GPA.

Scores on Factor 1 (Setting Goals and Priorities) were significantly correlated with only two scales, role ambiguity and self-reported performance. The correlations between Factor 1 and these scales were in the expected direction. Subjects who indicated that they set goals and priorities also reported less ambiguity in their school role and perceived their performances to be better than did those not setting goals or priorities.

Four significant correlations between Factor 2 (Mechanics—Planning, Scheduling) and the scales were found. The correlations between Factor 2 and GPA, self-rated performance, role ambiguity, and life satisfaction were in the hypothesized direction. Persons indicating that they engaged more frequently in the mechanics of time management (such as making lists, planning, and scheduling) also reported less role ambiguity but higher GPAs, higher self-ratings of performance, and higher satisfaction with life.

Factor 4 (Preference for Disorganization), which was only composed of five items, significantly correlated with three scales: role ambiguity, somatic tension, and GPA. The direction of these correlations was similar to those for the other factors. Those subjects who said they had more of a preference for organization also reported less role ambiguity and somatic tensions, and higher grade point averages.

To further explore the relationships between the four factors and the outcome measures, we conducted standard multiple regressions for each of the dependent variables, with all four factors entered into the equation at one time. In this way, the

amount of variance accounted for by the time management factors in predicting each outcome measure could be calculated, and the factors could be evaluated in terms of what each added to the prediction of the dependent variable, above that afforded by all the other factors. The R^2 and F values for these analyses are reported in Table 3. The factors adding significantly ($p < .01$) to the prediction of the dependent variable based on the t statistic are denoted in the table. For example, in Table 3, the time management factors accounted for 15% of the variance in the prediction of self-reported performance. In addition, Factor 3, Perceived Control of Time ($b = 0.61$, $t = 4.17$, $p < .01$), was found to significantly add to this prediction of performance above the contribution of the other three factors.

Correlations of Time Management Behavior Scale with Demographic Variables

As presented in Table 4, there was a significant relationship between the overall TMB score and age ($r = 0.18$, $p < .05$). Older subjects reported engaging more frequently in conventional time management behaviors. Similar relationships were also found for Factor 2 (Mechanics—Planning, Scheduling, $r = .17$, $p < .05$) and Factor 4 (Preference for Disorganization, $r = .18$, $p < .05$).

The overall TMB score also was found to be significantly correlated with sex ($r = -0.23$, $p < .05$). A one-way ANOVA was performed for gender of subject and a significant main effect was obtained, $F(1, 132) = 7.06$, $MS_e = 517.59$, $p < .05$. The means indicated that women ($M = 109.43$) were better time managers than men ($M = 98.76$). Similar results were found only for Factor 2 (Mechanics—Planning, Scheduling), with sex of the subject ($r = -.34$, $p < .05$), $F(1, 132) = 17.93$, $MS_e = 90.23$, $p < .01$. There was no significant relationship between race of subject and the overall TMB score.

The Type A–B behavior pattern was significantly correlated with only one of the time management factors, Factor 1 (Setting Goals and Priorities). Those who indicated that they set goals and priorities tended toward the Type A behavior pattern.

Table 4
Correlations Among Demographic and Background Variables With Time Management for Each Factor and Overall

Background variable	Overall TMB score	Factor 1	Factor 2	Factor 3	Factor 4
Age	0.18*	0.08	0.17*	0.11	0.18*
Sex ^a	-0.23**	-0.08	-0.34**	-0.04	-0.08
Type A–B	0.14	0.27**	0.05	0.01	0.04
TM seminar ^b	-0.27**	-0.23**	-0.23**	-0.15	-0.07
Read TM books ^b	-0.14	-0.10	-0.09	-0.06	-0.05
Internal prime time ^c	-0.33**	-0.31**	-0.20*	-0.21**	-0.21**

Note. TMB = Time Management Behavior Scale. Factor 1 = Setting Goals and Priorities; Factor 2 = Mechanics—Planning, Scheduling; Factor 3 = Perceived Control of Time; Factor 4 = Preference for Disorganization.

^a 1 = men; 2 = women. ^b 1 = yes; 2 = no. ^c 1 = morning; 2 = neither; 3 = night.

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

Correlations of Time Management Behavior Scale Factors with Background Variables

Students who hold full- or part-time jobs while attending school may engage more in time management behaviors to handle their busy schedules and perform well in their pursuits. Subjects reported the percentage of time they were employed in an average week. To examine this potential effect, the overall TMB and each individual factor were separately regressed on this percentage of employment variable. No significant effects were found.

Internal prime time is described as the time when you work best and thus, is an important aspect of time management according to Lakein (1973). A significant relationship between subjects' ratings of their internal prime times (morning, night, or neither) and time management ($r = 0.33$, $p < .0001$) was found, as shown in Table 4. A one-way ANOVA on this variable yielded a significant main effect, $F(2, 154) = 9.19$, $MS_e = 448.02$, $p < .001$. A post-hoc Newman-Keuls test found that morning persons had reported engaging more frequently in conventional time management behaviors ($M = 116.43$) than did night ($M = 99.78$) or neither ($M = 106.43$) persons. Subjects in the night and neither conditions were not found to significantly differ. A consistent pattern of results was also found for each of the TMB factors.

A significant correlation was obtained between scores on time management and attending a seminar on time management ($r = 0.27$, $p < .05$). A one-way ANOVA revealed a significant main effect, $F(1, 156) = 11.8$, $MS_e = 443.68$, $p < .001$, in which those who had attended a seminar ($M = 117.9$) engaged more frequently in conventional time management behaviors than did those who had not ($M = 103.9$). Similar results were found for two of the four factors: Setting Goals and Priorities ($r = .23$, $p < .05$) and Mechanics—Planning, Scheduling ($r = .23$, $p < .05$). However, a significant correlation was not found between both the overall TMB score and factors and whether one had read books on time management. Surprisingly, no significant correlations were found between the stress measures or self-reported performances and subjects' attendance at a time management seminar or reading of time management books. The intercorrelations among the various scales are displayed in Table 5.

Discussion

This study revealed two major findings. First, self-reported time management is multidimensional. Second, potentially important relationships were found between some aspects of time management and self-reported performance and stress. With regard to the findings of multidimensionality, four independent factors were revealed. Factor 1 (Setting Goals and Priorities) and Factor 2 (Mechanics—Scheduling, Planning) represented what is commonly considered to be specific time management behaviors taught in the training seminars. For example, items loading on Factor 1 included "I set short-term goals for what I want to accomplish in a few days or weeks" and "I set priorities to determine the order in which I will perform tasks each day." Factor 2 included items such as "I carry an appointment book with me" and "I make a list of things to do each day and check off each task as it is accom-

Table 5
Intercorrelations Among Scales and Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Outcome measure														
1. Performance rating	—													
2. Grade point average	.67**	—												
3. Role ambiguity	.24**	-.01	—											
4. Role overload	-.11	-.03	-.11	—										
5. Job tension	-.19*	-.07	-.07	.59**	—									
6. Somatic tension	-.16*	-.21*	-.04	.40**	.59**	—								
7. Job satisfaction	.22**	.19*	.24**	-.19*	-.32**	-.37**	—							
8. Life satisfaction	.19*	.17*	.05	-.25**	-.36**	-.48**	—							
Demographic & background variables														
9. Age	.19*	.30**	-.05	.20**	-.01	-.02	-.07	.02	—					
10. Sex	-.05	-.15	-.02	.01	.00	-.02	-.13	-.03	-.16	—				
11. Type A-B	.19*	.16	.27**	.21**	.38**	.20**	.06	-.06	.01	.02	—			
12. Time management seminar	-.06	-.03	.06	-.12	.06	.04	.06	-.06	.34**	.06	-.09	—		
13. Read time management books	-.08	-.10	-.08	-.07	.00	-.03	-.05	-.05	.29**	.01	-.05	.34**	—	
14. Internal prime time	-.12	-.03	-.14	-.06	.03	.11	-.10	-.19*	-.24**	.19*	-.07	.08	.16*	—

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

plished." Factor 3 represented a person's perception of control of time and is less "behavioral" than the other three factors. Examples of items loading highly on Factor 3 include "I feel in control of my time" and "I find myself overwhelmed by trivial and unimportant tasks." Factor 4 (Preference for Disorganization) consisted of the following types of items that address a person's preference for organization or lack thereof: "I can find the things I need for my work more easily when my workspace is messy and disorganized than when it is neat and organized" and "I have some of my most creative ideas when I am disorganized." The factors are fairly robust and account for much of the variance.

Contrary to typical assumptions about time management, these findings indicate that it is important to distinguish among the different facets of time management. The low correlations among the factors indicate that, for instance, if a person sets goals it does not necessarily follow that he or she feels in control of time or makes lists. The findings also reveal that the dynamics of time management are more complex than previously thought. Take, for example, the women in our sample. Interestingly, women were found to score significantly higher on the overall TMB than men in the study. Despite the higher frequency of women reporting engaging in conventional time management behaviors, such as making lists, planning, and scheduling, women felt no more in control of time. This finding may reflect a response to the type of role conflict commonly experienced by employed women (i.e., schedule incompatibilities; Pleck, Staines, & Lang, 1980). A possible interpretation of our results derives from Strang (1981), who found that women's pacing speed was positively related to items that indicated the ability to manage time (i.e., not putting things off until the last minute), whereas men's pacing speed was positively related to items that emphasized maintaining the control of time (i.e., considering daydreaming wasteful, being disturbed by a traffic delay). Other factors, such as type of work, may account for these differences between men and women and should be examined in future investigations.

A second major finding was that the various time management behaviors are related to important outcome variables, including stress and performance. Several of our findings appear consistent with past research and advice. The findings for Factors 1 and 2 support some of the conventional notions of time management. Those who practice time management behaviors are more clear about their role and perceive that they perform better. The strongest of the correlates, though, was Factor 3, Perceived Control of Time. The correlational and regression analyses revealed that the performance measures and affective measures of stress were significantly related to this factor. The findings are also consistent with stress research showing that feeling in control of the situation is related to lower levels of stress. The multidimensionality of the TMB is evident in that the strong pattern of relationships found for Factor 3 was not found for those behaviors typically representing time management behaviors, that is, prioritizing (Factor 1) and making lists (Factor 2).

Other significant correlations were found that were consistent with past research findings. Although these findings are not directly relevant to the hypotheses stated, they provide

directions for future research. As indicated in Table 5, our measures of stress are related to each other in a manner similar to the findings of Kahn et al. (1964). For instance, the two satisfaction measures were significantly related to role overload, job-induced tension, and somatic tension in a negative direction. Students noted less satisfaction with their work and life the more role demands they had to face and the more psychological and physical tension they felt. Further, role ambiguity was significantly related to job satisfaction and performance. Students who believed they were clear on their goals and role reported greater job satisfaction and performance. Also, consistent with previous experimental research (Hanel, 1981; King, Winett & Lovett, 1986), we found that students who had participated in a time management seminar reported engaging more frequently in time management behaviors than did those who had no prior training, but those who had attended the time management workshop experienced no less stress than those who had not.

It should be noted that the correlational nature of this study precludes making any causal statements. Therefore, several explanations for our findings can be proposed. There is the possibility that provides the rationale for this study—that poor time management behaviors may cause role ambiguity, role overload, somatic and job tensions, low satisfaction and poor performance outcomes. However, two alternative explanations are equally plausible. First, affective stress may cause poor time management. That is, students who are performing poorly and are dissatisfied with the present situation may, as a result of the accompanying stress, be less able to manage and control their time. Second, there is the possibility that all the variables are caused by some third variable. For example, it is possible that the correlations observed between time management behaviors and self-reported stress may reflect not a causal relationship between the two measures but the effect of a dispositional factor such as orderliness or a similar trait. Thus, students who are low on the orderliness trait are not able to prioritize work, move forward on a project, or say no to additional assignments. This deficiency may also cause students to be unclear about their duties, feel tensions, and be dissatisfied with the way things are going. All of these are reasonable alternatives that need attention in future research using experimental and longitudinal designs.

Another possible limitation of this study is its reliance on self-reported measures. More objective measures of performance, such as grades, test scores, and perhaps teachers' and peers' ratings of performance or observed stress reactions, should be used in future research. Additionally, replications of this work are needed with larger samples. The general rule of thumb in scale development is to have 10 subjects per variable with a 5:1 ratio considered the minimum (Nunnally, 1978). The homogeneity of our sample and the robustness of the resulting factors suggest that the 6:1 ratio of subjects to items in this study is sufficient, but future research should, nevertheless, further explore the stability of the factors.

Despite these limiting factors, the present research is the first step in the direction of developing a measure of time management behaviors. This measure seems to hold promise not only as a tool for understanding the dynamics of time management, but also as a criterion for evaluating the effec-

tiveness of time management training in experimental designs.

References

- Beehr, T. A., Walsh, J. T., & Tabler, T. D. (1976). Relationship of stress to individually and organizationally valued states: Higher order needs as a moderator. *Journal of Applied Psychology*, 61, 41-47.
- Bluedorn, A. C., & Denhardt, R. B. (1988). Time and organizations. *Journal of Management*, 14, 299-320.
- Bond, M. J., & Feather, N. T. (1988). Some correlates and purpose in the use of time. *Journal of Personality and Social Psychology*, 55, 321-329.
- Bost, J. M. (1984). Retaining students on academic probation: Effects of time management peer counseling on students' grades. *Journal of Learning Skills*, 3, 38-43.
- Cook, J. D., Hepworth, S. J., Wall, T. D., & Warr, P. B. (1981). *The experience of work*. New York: Academic Press.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297-334.
- Feather, N. T., & Bond, M. J. (1983). Time structure and purposeful activity among employed and unemployed university graduates. *Journal of Occupational Psychology*, 56, 241-254.
- Gall, M. D. (1988). *Making the grade*. Rocklin, CA: Prima.
- Gorsuch, R. L. (1983). *Factor analysis*. Hillsdale, NJ: Erlbaum.
- Hall, B. L., & Hursch, D. E. (1982). An evaluation of the effects of a time management training program on work efficiency. *Journal of Organizational Behavior Management*, 3, 73-96.
- Hanel, F. J. (1981). Field testing the effectiveness of a self-instruction time management manual with managerial staff in an institutional setting (Doctoral dissertation, University of Manitoba, Canada, 1981). *Dissertation Abstracts International*, 42, 3400B.
- House, R. J., & Rizzo, J. R. (1972). Role conflict and ambiguity as critical variables in a model of organizational behavior. *Organizational Behavior and Human Performance*, 7, 467-505.
- Ivancevich, J. M., & Ganster, D. C. (1987). *Job stress: From theory to suggestion*. New York: Haworth Press.
- Jenkins, C. D., Rosenman, R. H., & Zyzanski, S. J. (1965). *The Jenkins Activity Survey for Health Prediction*. Chapel Hill, NC: C. David Jenkins.
- Jordan, R. S., & Bird, B. J. (1989, April). *An exploratory study using the Future Time Perspective scale*. Paper presented at The Mid-West Academy Meeting, Columbus, OH.
- Kahn, R. I., Wolfe, D. M., Quinn, R. P., Snoek, J. D., & Rosenthal, R. A. (1964). *Organizational stress: Studies in role conflict and ambiguity*. New York: John Wiley.
- King, A. C., Winett, R. A., & Lovett, S. B. (1986). Enhancing coping behaviors in at-risk populations: The effects of time-management instruction and social support in women from dual-earner families. *Behavior Therapy*, 17, 57-66.
- Kornhauser, A. (1965). *Mental health of the industrial workers*. New York: Wiley.
- Krantz, D. S., Glass, D. C., & Snyder, M. L. (1974). Helplessness, stress level, and the coronary-prone behavior pattern. *Journal of Experimental Social Psychology*, 10, 284-300.
- Lakein, A. (1973). *How to get control of your time and your life*. New York: The New American Library.
- Longman, D. G., & Atkinson, R. H. (1988). *College learning and study skills*. St. Paul, MN: West.
- Matthews, K. A. (1982). Psychological perspectives on the Type A behavior pattern. *Psychological Bulletin*, 91, 293-323.
- Nunnally, J. C. (1978). *Psychometric theory*. New York: McGraw-Hill.
- Parry, G., & Warr, P. B. (1980). The measurement of mothers' work attitudes. *Journal of Occupational Psychology*, 53, 245-252.
- Pleck, J. H., Staines, G. L., & Lang, L. (1980). Conflicts between work and family life. *Monthly Labor Review*, 103, 30-32.
- Rizzo, J., House, R. J., & Lirtzman, S. I. (1970). Role conflict and ambiguity in complex organizations. *Administrative Sciences Quarterly*, 15, 150-163.
- Rosenman, R. H. (1978). The interview method of assessment of the coronary-prone behavior pattern. In T. M. Dembroski, S. M. Weiss, J. L. Shields, S. G. Haynes, & M. Feinleib (Eds.), *Coronary-prone behavior*. New York: Springer-Verlag.
- Schuler, R. S. (1979). Managing stress means managing time. *Personnel Journal*, 58, 851-854.
- Strang, H. R. (1981). Sex differences in perceptions of self-pacing. *Perceptual and Motor Skills*, 52, 174.
- Swick, K. J. (1987). *Student stress: A classroom management system*. Washington, DC: National Education Association.
- Walter, T., & Siebert, A. (1981). *Student success*. New York: Holt, Rinehart and Winston.

Received September 5, 1989

Revision received June 11, 1990

Accepted June 14, 1990 ■