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AUTHOR Wallace, Beverly A.; Winsler, Adam; NeSmith, Pat
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ABSTRACT

This study explored factors associated with success of college students with attention deficit hyperactivity disorder (ADHD). Forty-four students diagnosed with ADHD at the University of Alabama completed a 107-item survey pertaining to issues associated with ADHD symptomology, planning and scheduling of activities, study habits, focusing of attention, comorbidity of other learning difficulties, social relationships, help-seeking, and self-efficacy. The study found three factors were associated with success (as measured by grade point average): age (older students did better), feelings of self-confidence, and basic student responsibilities (the ability to plan and follow a sequenced schedule of activities). The study also found that students with additional learning disabilities were no more or less successful than other ADHD students. Students diagnosed with ADHD by age 15 had greater difficulty in reading and less difficulty in memorizing. Assistance at the high school and college levels was not related to academic success for these students. A statistical analysis of each survey item is attached. (Contains 14 references.) (DB)

Running Head: SUCCESS FOR COLLEGE STUDENTS WITH ADHD

Factors Associated with Success for College Students with ADHD: Are Standard Accommodations Helping?

Beverly A. Wallace
The University of Alabama
Tuscaloosa

Adam Winsler
George Mason University
Fairfax, Virginia

Pat NeSmith
Tuscaloosa Academy
Tuscaloosa, Alabama

Paper presented at the American Education Research Association Annual Conference, April 19-23, 1999, in Montreal, Canada. Address all correspondence regarding this paper to: Beverly A. Wallace, 1312 15th Avenue, Tuscaloosa, AL 35401.

Abstract

Higher education must provide students with Attention-Deficit/Hyperactivity Disorder (ADHD) with services that will allow them full access to education. However, very few studies of adult ADHD populations have been conducted, and services are based on symptomology in the K-12 population (Barkley, 1990). It is important for college administrators and school counselors to know which factors in ADHD symptomology should be addressed through intervention and accommodation. The purpose of this study was to explore factors associated with success of college students with ADHD. The survey developed for this study consisted of 107 items pertaining to ADHD symptomology. Three factors were associated with success: age, self-confidence, and basic student responsibilities. In addition, those with additional learning disabilities were no more or less successful. Those diagnosed with ADHD by age 15 had greater difficulty in reading and less difficulty in memorizing. Assistance at the high school and college levels was not related to academic success for these college students with ADHD.

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is reported to affect approximately 17 million people in the United States (Amen, 1995). Individuals with ADHD have been historically excluded from full participation in educational opportunities. The Americans with Disabilities Act (ADA) of 1990 opened the college door as never before to this group of students. By law, higher education must provide students with ADHD with support services that will allow them full access to education. However, very few studies of adult ADHD populations have been conducted, and services are typically based on symptomology evidenced in the K-12 population (Barkley, 1990). Currently, accommodations for college students with ADHD include special testing situations, extra tools, such as calculators allowed on tasks, and alternative note-taking devices, such as tape recorders. As colleges and universities prepare to fulfill their responsibilities to these students in compliance with the ADA, it is important for administrators to isolate which factors in symptomology should be addressed to insure the greatest potential for academic success for those with ADHD. By knowing which factors lead to success, administrators can develop programs aimed at ADHD, targeting these needs directly. Furthermore, by knowing the factors associated with success, those who educate at the K-12 levels can develop interventions so that students who enter higher education will come better prepared to learn.

Students with ADHD have certain characteristics which impede their ability to succeed in the college environment. Students with ADHD have trouble monitoring their own learning (Butler, 1995) and have more difficulty adjusting to the college environment than non-disabled students (Saracoglu, Minden, & Wilchesky, 1989). Characteristically, students with ADHD are found to be inattentive, impulsive, and lacking in response regulation (Barkley, 1990; Goldstein

& Goldstein, 1990). These characteristics are associated with impairments, such as working memory, effective use of learning strategies, problem-solving ability, rule generation, behavioral governance, and self-efficacy (Barkley, 1990; Biederman, Faraone et al., 1996; Erhardt & Hinshaw, 1994; Faraone, Biederman, Wozniak, Mundy, Mennin, & O'Donnell, 1997). Furthermore, individuals with ADHD tend to exhibit behaviors indicative of social maladjustment, including aggressiveness (Thompson, Riggs, Mikulich, & Crowley, 1996) and withdrawal from social contact (Arnold, 1996). The absence of these self-regulatory, learning, and social skills often leads to failure to achieve academically.

Purpose of the Study

Of interest in the study were several questions corresponding to the inventory components indicative of the issues which have shown by research to be associated with characteristics of students with ADHD: (1) What factors are associated with academic success for students with ADHD at the college level? (2) Do those students with comorbid diagnoses have less self-confidence and experience lower levels of academic success than those without? (3) Is an earlier diagnosis associated with a greater ability to employ effective study habits, control problem behaviors, and maintain a positive attitude? (4) Is the presence of help by service providers in high school related to college success? (5) Are students who seek help from college instructors, tutors, and the support services agency in college more likely to be successful than those who do not seek assistance?

Method

Subjects

Forty-four students currently enrolled in The University of Alabama during the spring semester, 1996, were asked to respond to a survey. All participants had met diagnosis criteria

established by the Center for Teaching and Learning for Attention Deficit Hyperactivity Disorder. Forty-four students responded to the survey. Eighteen males and 25 females participated in the study. The average age was 21 years.

Survey Instrument

The survey developed expressly for this study consisted of 107 separate items pertaining to issues associated with ADHD symptomology: planning and scheduling of activities, study habits, focusing of attention, comorbidity of other learning difficulties, social relationships, help-seeking, and self-efficacy.

Data Reduction

This survey was designed to explore certain dimensions of ADHD symptomology. Multiple items addressed areas, such as study habits, problem behaviors, and psychosocial issues. In order to handle the data effectively, several steps were followed to reduce the total number of items to be analyzed. First, all items contained in the survey were read carefully, and those that required reverse coding were coded accordingly. Second, the items were gathered together to form groupings. The survey items were aggregated hierarchically into composites, and the composites into categories. To accomplish this, items were aggregated into composites by grouping like items together. For instance, "my mind tends to wander during classroom lectures" and "I can only maintain attention during interesting classes" were two items that were grouped together to form the composite, General Attention. Fifteen composites were identified: Responsibility, Self-confidence, Importance of Friends, Basic Student Responsibilities, Study Strategies, Other Regulation and Service Use, Study Follow-through, Social Skills, Arousal Regulation/Impulsivity, General Attention, Attention Control, Attention to Detail, Reading, and Memorizing. To complete the aggregation process, the composites were placed into categories

of like composites. For instance, Social Skills and Arousal Regulation/Impulsivity seemed to both be indicative of problems associated with ADHD. As a result of the groupings, three categories were designated: Attitudes, Studying, and Problems. Appendix A provides a list of the items within each category and composite, as well as the means and standard deviations for each composite.

After the items were categorized, inter-item correlations within categories were calculated as were Cronbach alphas for the scales. The 15 composites were subjected to an inter-item reliability statistical test so that alpha coefficients could be determined. Inter-item correlations of .3 or greater and Cronbach alphas of .5 or greater were criteria used for dividing items into composites. In cases where the alpha coefficient was not satisfactory, items with the lowest item to item correlations were removed from the composite. If an item did not correlate well with other items in the grouping, and if the literature supported its inclusion in another factor, it was moved. If an item did not fit in any composite, it was removed and eliminated from further statistical analyses. Nine items were removed. Table 1 gives a summary of the composites within each category, a representative item for each composite, and the Cronbach alpha coefficients for each composite.

Table 1

Categorical Factors and Their Reliability Coefficients

Category / Composite	Representative Item	Alpha
Attitudes		
responsibility	I take responsibility for things that happen in my life.	.53
self-confidence	I am a competent test taker.	.59
importance of friends	I spend a lot of time with my friends.	.72

Table 1, continued

Categorical Factors and Their Reliability Coefficients

Category / Composite	Representative Item	Alpha
Studying		
basic student responsibilities	When absent from class, I copy notes from another student.	.74
study strategies	I take notes as I read to help me learn material.	.78
other regulation and service use	I use the LD/ADD support services at the University.	.54
time planning	I keep a list or calendar showing scheduled exams, projects, papers, and other major assignments.	.88
Study Follow-through	I keep up with my assignments on a daily basis.	.87
Problems		
social skills	I have trouble maintaining friendships.	.68
arousal regulation/impulsivity	I say things before I've thought them through.	.77
general attention	My mind tends to wander during classroom lectures.	.57
attention control	I can pay attention when I want to.	.55
attention to detail	I often miss small details that need attention.	.76
memorizing	Memorizing material is easy for me.	.86
reading	Reading college textbooks is easy for me.	.66

Data Analysis

Research question 1 asked what factors were associated with academic success for students with ADHD at the college level. Step-wise multiple regression procedures with backward deletion was used to answer this question. All 15 composites were entered as independent variables. An additional independent variable, age, was added since age could represent a developmental component to ADHD symptomology. Grade point average (GPA) was chosen to denote college success and was, therefore, the dependent variable. The final reduced model of the following 3 variables did significantly predict college success: age, feelings of confidence and competence, and the fulfillment of basic student responsibilities ($F=7.96$; $df=3, 35$; $p=.00$; adj.$R^2=0.35$). Table 2 provides the summary statistics for this analysis.

Table 2

Factors Associated with Success for College Students with ADHD

Factor	Beta	T	Sig. T
Age	0.32	2.29	0.03
Attitude:			
Self-confidence	0.37	2.84	0.00
Studying:			
Basic Student Responsibilities	0.54	3.89	0.00

Older students with ADHD had higher GPAs than younger students with ADHD. Furthermore, those students who were confident in their abilities and accepted basic student responsibilities, like going to class and taking notes, were more successful than those with ADHD who were not confident and did not fulfill basic student responsibilities.

Research question 2 asked if those college students with ADHD and one or more comorbid diagnoses had less self-confidence and experienced lower levels of academic success than those without a comorbid diagnosis. Comorbidity was determined by accessing student files and noting if the student had ever been formally identified as having a learning disability recognized under DSM III criteria in addition to the ADHD diagnosis. Comorbidity, the independent variable, was designated as 1=yes regardless of the number of additional diagnoses. Success in college, dependent variable 1, was defined by GPA for the semester in which the survey was completed. Self-confidence, dependent variable 2, was one of the composites previously identified as part of the data reduction. The t tests showed no difference between those college students with ADHD who did or did not have comorbid diagnoses and self-confidence (without comorbidity - N=26, $\underline{M}$=2.48, SD=0.81; with comorbidity - N=13, $\underline{M}$=2.46, SD=0.69) or GPA (without comorbidity - N=28, $\underline{M}$=2.33, SD=0.69; with comorbidity - N=13, $\underline{M}$=2.30, SD=0.37). Students who had an additional learning disability were no more or less

successful than those who did not have an additional diagnosed disability. Students who had an additional learning disability were no more or less confident than those who did not have an additional diagnosed disability.

Research question 3 asked if an earlier diagnosis of ADHD was associated with a greater ability to employ effective study habits, control problem behaviors, and maintain a positive attitude. T tests were used to answer this question. Earlier diagnosis was defined as a student being identified with ADHD by age 15. Nine students qualified as having received an earlier diagnosis according to this criterion. Missing data for those who did not receive diagnosis by age 15 years was handled on an analysis by analysis basis. The 15 previously derived composites were the dependent variables used in this analysis. Results indicated that college students who were diagnosed with ADHD earlier reported having significantly less trouble with memorizing/taking tests and more difficulty in reading. Table 3 provides the summary statistics for this research question.

Table 3

Earlier Diagnosis and Study Habits, Problem Behaviors, and Positive Attitude

Category / Composite	Students Diagnosed by Age 15 Years			Students Not Diagnosed by Age 15 Years		
	N	Mean	SD	N	Mean	SD
Attitudes						
Importance of Friends	9	3.17	0.63	33	3.11	0.67
Responsibility	9	3.22	0.67	34	3.09	.66
Self-confidence	9	2.78	0.93	32	2.38	0.67

Table 3, continued

Earlier Diagnosis and Study Habits, Problem Behaviors, and Positive Attitude

Category / Composite	Students Diagnosed by Age 15 Years			Students Not Diagnosed by Age 15 Years		
	N	Mean	SD	N	Mean	SD
Problems						
General Attention	9	2.81	0.80	33	2.60	0.75
Attention Control	9	2.30	0.90	33	1.99	0.56
Attention to Detail	9	2.63	0.92	34	2.72	0.66
Memorizing*	9	2.44	1.16	33	3.17	0.89
Reading*	9	1.33	0.66	34	1.90	0.71
Arousal Regulation/ Impulsivity	9	2.57	0.65	34	2.75	0.11
Social Skills	9	1.79	0.74	33	1.67	0.65
Studying						
Basic Student Responsibilities	9	2.58	0.86	34	2.66	0.61
Other Regulation and Service Use	9	2.44	0.75	34	2.15	0.64
Study Strategies	9	2.44	0.93	34	2.51	0.66
Study Follow-through	9	2.14	0.65	34	2.13	0.64
Time Planning	9	2.78	0.90	34	2.59	0.65

* p =.05 Higher mean for Memorizing indicates **more** difficulty
* p =.04 Higher mean for Reading indicates **less** difficulty.

Research question 4 asked if the presence of help by service providers in high school was related to college success. A t test was used to answer this question. The independent variable "Help by service providers in high school" was derived from one of the survey items that asked, "Did you get help for your LD in high school?" A total of 8 students reported receiving help in high school while 32 students reported that they did not receive help in high school. GPA was used to denote college success, the dependent variable. Results indicated that there was no significant difference between those who did and did not receive help in high school on the measure of GPA. Those who received help in high school were no more or less successful in

college than those who did not receive help in high school (received help in high school - M=2,4289, SD=0.47; did not receive help in high school - M= 2,33, SD=0.64).

Research question 5 asked if students who currently seek help from college instructors, tutors, and the support services agency in college are more likely to be successful than those who do not seek assistance. Thirty-two students reported that they did not seek help while 8 reported that they did seek help from college instructors, tutors, and the support services agency in college. The independent variable was defined as one of the composites, Other Regulation and Service Use. The dependent variable, again, was GPA. Results indicated that there was no significant difference between those students with ADHD who sought help in college and those who didn't in terms of GPA. Those who sought help were not any more successful than those who did not (seeking help - M=2.42, SD=0.47; not seeking help - M=2.33, SD=0.64).

Conclusions and Implications

There are several inferences that can be drawn from these data analyses. Several primary findings indicate that those who provide programs and services for college students with ADHD may want to further examine the activities and services they currently furnish. First, three factors associated with student success: feelings of confidence and competence, the ability to follow a sequenced schedule of activities, and basic student responsibilities, are areas known to be associated with success for all students, not just those with ADHD. Those with ADHD can benefit from courses offered by other University agencies, such as study skills classes. In light of the findings concerning the potential benefit of following a schedule, a post hoc correlational test was performed to determine if an association existed between Time Planning and Study Follow-through, two composites from the survey. The correlation was r=0.72, p<.001). Although direction of causation cannot be inferred from these data, it may be that if students are taught

how to plan effectively when studying for tests, writing papers, etc. in a study skills class, these students will also follow through with those plans. Research indicates that feelings of confidence are associated with steps taken to achieve goals (Bandura, 1993; Miller, Behrens, & Greene, 1993). This survey offers further support to that research. Further investigation that targets effort feedback and other attributional feedback strategies should be conducted. Studies by Schunk and Cox (1986) and Duchardt, Deshler, and Schumaker (1995) provide insight into ways such studies can be conducted within the context of a study skills course or counseling sessions in a learning center environment.

In addition to self-confidence and scheduling, age was a factor in college success for students with ADHD. Older students with ADHD did better in college than younger students. While there could be an attrition effect so that only students who do relatively well stay in college, it may be that older students have more self-confidence, will follow a schedule, and therefore do actively participate in the learning process due to their greater maturity. In this sample, the correlation between age and self-confidence, however, was not significant (r^2=.006, p=.97), indicating that self-confidence and age are not related. This non-significance, though, may be a result of the small sample size coupled with the wide age range. Even after aggregating age ranges, however, there remained no significance. The correlation between age and following a schedule is significant (r^2=-.31, p=.04), indicating a relationship. Further research into the profile of the adult student with ADHD is warranted. An important question is whether or not the older students are returning after having failed in a first attempt at college. If these students are attending college for the first time, are those who have failed because they cannot follow-through with study strategies also those for whom ADHD is more debilitating? Or, is it that those who fail due to the inability to follow-though with study strategies simply need to be taught

overtly how to follow-through? If so, study skills interventions at the middle school, high school, and college levels may be able to increase the number of students with ADHD who successfully follow-through with study strategies. In addition, high school counselors may need to intervene at the high school level to make sure students with ADHD are prepared for the rigors of college.

Research question 2 asked if those college students with ADHD and one or more comorbid diagnoses had less self-confidence and experienced lower levels of academic success than those without a comorbid diagnosis or diagnoses. Those with and without comorbid diagnoses of learning disabilities did not differ in self-confidence or academic success. The mean for self-confidence was slightly above average on the 4- point scale used in this survey (mean = 2.45), indicating that this sample did not have confidence levels that were overly inflated in comparison to their GPAs (mean = 2.33). As reported earlier, self-confidence and basic student responsibilities are related to GPA. Those students surveyed who act responsibly by doing such things as taking notes in class and who are confident in their abilities had significantly higher GPAs. This additional information bolsters the argument that it is not a matter of how many areas are deficient for a student. Instead, how a student perceives his or her ability to compensate for the deficiencies and how much that student is willing to act as a responsible student are important to academic success. While time management and basic study skills are fairly easy to teach in a freshman seminar, self-confidence develops only through long experience.

This may further indicate the efficacy of conducting experiments aimed at pairing scheduling successes, e.g. good grade on an exam for which the student planned and studied effectively, with effort feedback, e.g. helping the student connect the scheduling with the good

grade. The non-significance between comorbidity and lack of success and self-confidence may also be due to the fact that all groups, regardless of the presence or absence of comorbidity, were afforded the same basic accommodations, such as calculators on tests, isolated testing situations, tape recorders, and more time to complete examinations. Another possibility is that there are differences that were undetected by the survey because this institution does not differentially diagnose or provide different accommodations for specific learning disabilities. However, it may also mean that providing basic study skills training is enough to increase the potential for success for all students with ADHD, regardless of additional learning disabilities.

Research question 3 asked if an earlier diagnosis of ADHD was associated with a greater ability to employ effective study habits, control problem behaviors, and maintain a positive attitude. Results indicated that college students who were diagnosed with ADHD earlier reported having significantly less trouble with memorizing/taking tests and more difficulty in reading. Since only 2 students had a diagnosed reading disability, any post hoc statistical tests to explore possible relationships between this specific comorbid disability and general problems in reading were not feasible. However, two things should be noted. Often students with more severe ADHD symptomology are identified earlier in school. These students may have received training in memory techniques as part of a special education or compensatory education class. I may also be, however, that memory is not a problem for these students. This may explain their reporting significantly less trouble with memorizing. While these same students may have received special help with reading also, it may be that the increased demands of college reading are problematic because attention wanders or because these students were much poorer readers to begin with. This would indicate that reading per se may not the disability, but the distractibility is, and this impedes the perceived reading difficulties. Again, further research

studies that investigate various aspects of more complex elements of reading may be warranted, e.g. sequencing of information, important concepts, etc. This research should direct attention beyond student perceptions and examine how and to what extent the student with ADHD processes complex written material.

Research question 4 asked if the presence of help by service providers in high school was related to college success. Help in high school was not related to a higher GPA in college. This should be explored further. It may be that the services provided at the high school level do not address the issues that are relevant and useful to those with ADHD.

Research question 5 asked if students who seek help from college instructors, tutors, and the support services agency in college are more likely to be successful than those who do not seek assistance. In addition to help in high school, it appears that help provided at the college level is not meeting the specific needs of those with ADHD either since this help was not related to college success for those in the study. It may be that since all students with ADHD receive certain accommodations, students do not perceive the need to seek additional assistance. However, this is problematic when students do require assistance and do not seek help. It may be that there is no other assistance provided by the university other than what is already offered to students with disabilities. If this is true, it is apparent that the areas associated with college success deserve further study. Optimally, high school and college programs designed to foster success through effective study strategies and appropriately placed self-confidence building techniques will be explored through research and practice.

Caution must be exercised in generalizing the results of this study due to the small sample size, especially in consideration of the large number of items contained in the survey. Nonetheless, the study does provide evidence that successful college students with ADHD do

engage in activities which are necessary for success for all students. Furthermore, time management and student responsibilities are skills that can be taught at all educational levels. Acquisition of these skills early will produce meaningful, positive experiences resulting in self-confidence, a factor instrumental to success in college for students with ADHD. Perhaps if these skills are taught in developmentally appropriate ways throughout the elementary and secondary years, self-confidence will develop and age will no longer be a factor in college success.

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Category / Composite / Survey Item 1=not often 2=sometimes 3=frequently 4=almost always	Composite Mean	SD
ATTITUDE		
Responsbility	**3.10**	**0.65**
58 I take responsibility for things that happen in my life.		
85 Responsibility		
Self-Confidence	**2.45**	**0.74**
67 I am a competent test taker.		
75 I can do anything I set my mind to doing.		
Importance of Friends	**3.12**	**0.644**
89 Making friends is important to me.		
90 Relationships are very important to me.		
91 I spend a lot of time with my friends.		
102 I know how to maintain relationships.		
PROBLEMS		
Social Skills	**1.69**	**0.65**
93 I have trouble maintaining friendships.		
94 I consider myself a loner.		
95 I wish that my social skills were better.		
97 Keeping friends is difficult because of my ADD.		
Arousal Regulation/Impulsivity	**2.71**	**0.67**
31 I study only when I have energy to study.		
33 I feel restless in lecture classes.		
57 I have trouble maintaining an even energy level.		
98 I say things before I've thought them through.		
99 My mind is thinking about things to say faster than my mouth can speak.		
84R Maintaining energy level		
General Attention	**2.64**	**0.75**
19 My mind tends to wander during classroom lectures.		
28 I lose points on examinations because I incorrectly read the directions or test questions.		
73 I can only maintain attention during interesting classes.		
Attention Control	**2.05**	**0.64**
70 I can pay attention when I want to.		
83 Maintaining attention		
72 I can focus without medication if I put my mind to it.		
Attention to Detail	**2.73**	**0.73**
86R Paying attention to details		
66R I pay close attention to small details so that I don't make mistakes.		
59 I often miss small details that need attention.		
Reading	**1.78**	**0.73**
77 Reading textbooks		
61 Reading college textbooks is easy for me.		
Memorizing	**2.98**	**1.00**
67 I am a competent test taker.		
64R Memorizing material is easy for me.		
88R Memorizing		

Category / Composite / Survey Item 1=not often 2=sometimes 3=frequently 4=almost always	Composite Mean	Composite SD
STUDYING		
Basic Student Responsibilities	**2.62**	**0.66**
11 I study my class notes on a regular basis.		
18 I attend class.		
21 When absent from class, I copy notes from another student.		
23 I complete all assigned readings before going to class.		
25R My class notes are too disorganized to be helpful when I am studying for examinations.		
Study Strategies	**2.48**	**0.71**
17 I organize my notes and class handouts.		
43 I study during my most alert time of day.		
54 I take notes as I read to help me learn material.		
55 I use memory devices like forming a rod out of the first letters of things on a list to help me remember material.		
63 After I read a few paragraphs in my text, I repeat the material to myself in my own words.		
Other Regulation and Service Use	**2.19**	**0.67**
22 I ask the instructor to explain concepts that I do not fully understand.		
30 I ask for accommodations for my ADD from my instructors.		
36 I use the LD/ADD support services at the University.		
52 I use tutors to help me learn material.		
Time Planning	**2.60**	**0.72**
10 I schedule specific times to study for each of my courses.		
13 I keep a list or calendar showing scheduled exams, projects, papers, and other major assignments.		
15 I rank my personal and study needs in order of importance and budget my time on this basis.		
34 I use a daily planner to help keep myself organized.		
45 I have a set time to do my laundry, shopping, and cleaning.		
47 When making my schedule, I first write in my inflexible times such as class time and work hours before I schedule other things.		
51 I set goals for my life.		
60 I set daily goals for myself.		
87 Setting goals for my life is not difficult for me. (Setting goals for my life)		
Study Follow-through	**2.11**	**0.64**
4 I follow a definite study schedule.		
6 I keep up with my assignments on a daily basis.		
8 I start working on a long-term project well before its due date.		
26 I review my notes the day of a class session and regularly after that.		
27 I keep up with my studying on a regular basis right up until exam time.		
29 I begin reviewing for an examination a few days in advance of the day it will be given.		
35R I wait until two or three days before a project is due to begin working on it.		
74 I begin preparing for exams weeks in advance.		

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Author(s): Beverly A. Wallace, Adam Winsler, Pat McSmith	
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Signature: Beverly A. Wallace	Printed Name/Position/Title: Beverly A. Wallace, Faculty Consultant	
Organization/Address:	Telephone: (205) 758-1683	Fax: (205) 348-7150
	E-mail Address: 101322.377@compuserve.com	Date: May 28, 1999

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