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**AUTHOR** Fincher, Cameron  
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**ABSTRACT**

A study examined the predictive efficiency of the Scholastic Aptitude Test (SAT) for adult learners in the University System of Georgia (USGA). Also investigated during the study were the effects of variables such as age, sex, and race on the performance of adult learners on the SAT and in college and the relative academic performance of adult learners and traditional college-aged students. Based on an analysis of data collected from various subpopulations of the total population of 1,694 adults who were identified as adult learners enrolled in the USGA, the researchers concluded that while the verbal and math SAT scores of adult learners correlated significantly with their grades, the coefficients of these correlations did not match what is customarily found in traditional college-aged populations. The usefulness of the SAT in predicting adult learning lies, as it usually does, in the incremental effectiveness of verbal and math scores when they are used in conjunction with high school grades. These conclusions led the researchers to caution admission directors, registrars, and testers who combine verbal and math SAT scores for a total SAT score that they are destroying valuable information about the learning competencies of learners. (MN)

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# ADULT LEARNERS AND THE SAT IN THE UNIVERSITY SYSTEM OF GEORGIA

by

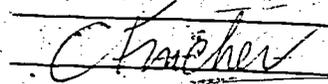
Cameron Fincher  
Institute of Higher Education  
University of Georgia

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## FOREWORD

This report has been slow in coming. Funded by The College Board in October 1980, the study was scheduled for completion in March 1981. Early completion was only one of many optimistic expectations.

The proposal for the study was based on the expectation that data on the adult learners in University System of Georgia institutions could be readily retrieved and analyzed. For several units of the University System this was indeed the case. For other units, however, there was unexpected difficulty in identifying students 25 years of age or older and in several cases SAT scores, grades, and other data requested could not be retrieved for the academic terms chosen for the study. Consequently, only 23 units of 33 institutions within the University System participated in the study, and the number of adult learners was reduced to 1694, an unknown proportion of an unknown total.

The original intent of the study was to compare the predictive efficiency of the SAT for adult learners with the SAT's predictive efficiency and usefulness for traditional college-age students within the University System of Georgia. Informal analyses of SAT scores and grades had suggested that adult learners scored higher on the SAT-Verbal scale and made somewhat higher grades in their freshman year. It was anticipated that correlational analyses would show a substantial relationship between performance on the SAT and performance in the classroom.

The University System of Georgia was chosen for the study -- for obvious reasons. The SAT has been required of all entering freshmen since 1957 and until the recent approval of a provisional admissions policy, the requirement was not waived for students over 24 years of age. As a result, there are more data available on the

SAT within the University System of Georgia than any other statewide system of public higher education. With one exception, the University System of Georgia consists of all public colleges and universities within the State. Four of the 33 separate institutions are identified as "university-level" institutions; fourteen are identified as senior or four-year colleges; and fifteen are identified as junior or two-year colleges.

Appreciation is due Tom Redmon for his encouragement in proposing and conducting the study -- and to Sol Arbeiter for his congenial patience in the receipt of preliminary tables when he would have preferred a finished report. Joe Simonet has rendered service above and beyond that associated with graduate assistance; his many trips to the Computer Center made the analyses possible and his willingness to re-run matrices -- just to satisfy the principal investigator's curiosity -- deserves much praise. Elisa Albertson is due special thanks for her "mag card composition" of detailed tables and excessively edited interpretations. Knowing the lateness of the report, she graciously sacrificed a Saturday to meet a fourth or fifth deadline.

Cameron Fincher  
Regents Professor of Higher Education  
& Psychology  
Director, Institute of Higher Education  
University of Georgia  
September 20, 1982

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## INTRODUCTION

The advent of the adult learner and the promise of a learning society are two optimistic notes in a national discourse with many pessimistic undertones. A twenty-year bulge in the nation's birthrate has run its course, and the nation's traditional college-age population of 18-24 years has begun to shrink both absolutely and relatively. During the decade of the 1980s the traditional college-age population will decline 14.6 percent while the age group of 35-44 years will increase at least 42.0 percent. In 1990 the nation will have 4,314,000 fewer college-age residents, a figure that is approximately one-third of the nation's college enrollment at the beginning of the decade. In contrast, there will be 15,785,000 more adults between the ages of 25 and 44 years. This is a relative increase of 20.3 percent and a figure that invites many comparisons.

The first wave of the post-WWII generation that entered college in 1964 are now in their mid-thirties and twice the age they were eighteen years earlier. They and their later cohorts have borne the title of baby-boomers, and it is their significantly large numbers that have already begun a boom for the mid-life years. If some demographers are correct in their assessment, it is the advent and the passage of the baby-boomers that constitute the most significant event of the post-WWII 20th century. Not only did the baby-boomers represent the nation's most dramatic increase in birthrate, they have produced the nation's sharpest drop in birthrate in its history. Many of the baby-boomers are parents of the baby-busters who will represent the trough of projected college enrollments in the late 1980s.

### Education For Adults

A national portrait of the adult learner has been provided by Arbeiter (1977). In 1975, according to the National Center for Educational Statistics, there were over 17 million adults participating in education at some level. Included in this number, however, were an unknown number of 17 to 24 year-olds who were engaged in some form of adult education. Approximately four out of ten of these adult learners were in the 25-34 age group, and approximately four out of ten were over 34 years of age. These data imply that the participation of adults in education is extensive. One out of four apparently had some college education prior to their participation in adult education, and a significant number of them are college graduates.

The participation of adults in education is related to family income, suggesting that the participation of adult learners increases as the level of family income rises. As would be expected, perhaps, the largest number of adult learners was found in four-year colleges and universities. The next largest number of adult learners, however, were employees undergoing some form of job training. The third largest number of adult learners was found in the nation's two-year colleges.

Participation in adult education, we may conclude, is related to the prior educational level of the participants, their sex, and their reasons for taking adult education courses. At all age levels, whites are more likely than blacks to seek adult education. Men apparently participate in adult education to improve or advance in their jobs while women are more inclined to participate for reasons of personal or family interests. No appreciable sex differences are found in other participant reasons for adult education, such as "general information" "social or recreational reasons" and "to get a new job."

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Again as expected, rural residents are less likely to participate in adult education than urban residents. When rural adults do participate in adult education, they may prefer self-study without formal instruction.

### Lifelong Learning

The social forces and public policies encouraging participation in education as a lifelong experience have been explored by Richard Peterson (1979) and several colleagues. The concept of lifelong learning has received extensive thought and discussion at national, regional, and state levels. As in other forms of education, lifelong learning has been dependent upon local or institutional initiatives, but federal and state policies are increasingly sensitive to the needs of adults seeking education at later stages of their intellectual, cultural, and personal development. The pressures for lifelong learning are intensified, no doubt, by the increasing age of the U.S. population, and by the increased attention given adult development as a major trend or development in contemporary society (See Knox, 1977 and Chickering, 1981).

Passage of the Lifelong Learning Act in 1976 is believed by Peterson to be a manifesto on the nation's need for lifelong learning services. The concept of lifelong learning has received even further impetus in Europe and is regarded as a "master concept" in education for the remaining years of the 20th Century. In brief, Peterson and his colleagues present a remarkable overview of programs and opportunities for lifelong learning in the U.S. The diversity of educational efforts with respect to lifelong learning is indeed impressive and the implications for the nation's colleges and universities are significant.

Pat Cross (1981) has accepted lifelong learning as neither a right nor a privilege

but as a necessity. In her latest book, she documents the growth of the "learning society" that has evidently evolved and summarizes in commendable fashion the literature on adult learners in America. Cross' consideration of the adult learner in higher education is a logical culmination of her previous interest in "the new student" and her concern with the diversification of college curricula and the improvement of instruction. Her writings suggest strongly that a philosophy of adult learning is evolving and that the adult learner will receive increasing attention from colleges and universities as they are recruited in a context of declining enrollments of traditional college-age students.

#### Reasons For Learning

The extent to which adult learners will bring new demands and expectations to institutions of higher education is yet to be documented. There are reasons to believe that as they enter academic programs at the college level, they will expect to be taught in ways which are sensitive to an adult's maturity and life experiences. There is also reason to believe that they will expect to be evaluated in a different manner.

Aslanian and Brickell (1980) have inquired into the causes and reasons for adult learning, with the interesting and relevant conclusion that many adult learners are motivated by life changes in the adult years. They see the adult learner as being in one of several stages of transition that are a part of the adult life cycle. Adults are thus strongly motivated to learn because they must cope with conditions or situations that impose upon adults the need for new skills and competencies, the exercise of new or different learning interests, and the opportunity to change or re-direct

living styles. An interesting concept in Aslanian and Brickell's report is the "triggering event" which they believe to stimulate learning. Adult learning and development are thus seen as a highly significant societal trend. Public policy is interpreted as increasingly facilitative of adult development and educational policies are increasingly modified to foster formal and informal programs of instruction.

No knowledgeable observer doubts the increased participation of adults in postsecondary education. There are numerous questions, however, concerning the extent to which adult learners can or will replace traditional college-age students as they decrease in number. Solmon and Gordon (1981) have identified a substantial number of students who are over the age of 21 and who are entering college for the first time. They, too, find that a majority (57%) of the adult learners in the nation are females who, as a group, are predominantly white. Their survey suggests that a majority (63%) of the nation's adult learners attend a four-year college or university while only 37 percent attend a two-year college. The responses of Solmon and Gordon's adult learners indicate that they are attracted to a particular institution by the quality of its academic program, its offerings of special educational programs, and its proximity to their place of residence.

Solmon and Gordon's study suggests, however, that adult learners have had somewhat poorer preparation in all academic areas at the secondary level. The majority of these adult learners did pursue a college preparatory program in high school but not to the same extent as their traditional classmates. It is not surprising, therefore, that adult learners may enroll in institutions with lower admission standards.

Although the adult learners in Solmon and Gordon's study report lower aspirations than the traditional college-age classmates, they are apparently motivated in

much the same manner. Business is an increasingly popular field of study for adult students and majors in medical and health professions are a frequent choice. It is thus evident that adult learners enter institutions of higher education with career-related goals and plans. Virtually all of them (97%) expect to earn some kind of degree.

### Learning Competencies

Although the participation of adult learners in higher education has been much studied and much discussed, there is little knowledge of the skills and competencies adult learners bring to their college coursework. Because of work, marriage, and other intervening life experiences adult learners are believed to be more capable of self-directed learning, but because of their longer absence from formal education, there is the distinct possibility that the academic competencies measured with nationally administered, standardized tests may have declined. On the one hand, adult learners may enter college with advantages over their younger classmates; on the other hand, they may enter with serious disadvantages in advanced learning skills.

The extent to which the College Board Scholastic Aptitude Test (SAT) accurately reflects the verbal and mathematical abilities of adult learners and the extent to which SAT scores are predictive of their academic performance at the college level are matters of particular importance. The University System of Georgia - - a statewide system of public higher education consisting of 33 separate institutions - - has required the SAT of all entering freshmen since 1957. Twenty-three years of experience with the SAT has documented its usefulness in predicting the grades of freshmen entering units of the University System, but no study has been previously made of the performance of adult learners on the SAT and the extent to which their SAT scores

predict academic performance. The purpose of this study, therefore, is to investigate the predictive efficiency of the SAT for adult learners in the University System of Georgia (USGA). Adult learners are defined simply as adult students who are 25 years of age or older and who have enrolled in some unit of the University System.

More specifically, the objectives of the study are:

1. To analyze the predictive validity of the SAT and its usefulness in predicting the academic performance of USGA adult learners.
2. To compare, when feasible, the academic performance of adult learners with the academic performance of traditional college-age students.
3. To evaluate the incremental effectiveness of the SAT when combined with high school grades in the prediction of college grades.
4. To examine other variables such as age, sex, and race as they may be related to the performance of adult learners on the SAT and in the college classroom.

## ADULT LEARNERS IN GEORGIA

The adult learners enrolled in institutions of the University System of Georgia are a diverse group with several interesting contrasts to the traditional college-age population. The average age of the total group is 31 years, implying that as a group the adult learners are not persons approaching middle age as much as they are young adults who may have been delayed in their efforts to seek a college education. Only two percent of the group is over 50 years of age, and no more than 14 percent are over 40 years of age. Almost one-half of the group (45.6%) are still 30 years or younger. (See Appendix A for the frequency distributions of these and other group characteristics).

The gender and racial/ethnic identities of the adult learners may be their most striking characteristics. Almost two out of three of the adult learners (65.8%) are female, and an overwhelming majority (83.1%) are white. No more than 15 adult learners have been identified as Asian in ethnic or national origin and only 17 have been identified as Hispanic. Two of the adult learners, however, were identified as American Indian and almost 15 percent were identified as black. When compared to the traditional college-age students in the University System of Georgia, female adult learners are obviously over-represented in the total group of USGA students and minority groups may be under-represented.

### High School Preparation

The typical adult learner in Georgia graduated from high school in 1969 with a high school average of 2.2 on a four-point grading scale. As would be expected, the age of adult learners correlates negatively with their year of high school graduation

(.96); all but seven have graduated from high school since the end of World War II and the majority of the group (67.7%) has graduated from high school since the mid-sixties. This finding implies, as does the age of the group, that the majority of adult learners in Georgia are members of the post-WWII generation and are not yet middle-age adults in mid-career.

The secondary preparation of the group, as reflected in their reported grades, is somewhat less than that seen in traditional college-age applicants. Only 22.4 percent of the group have an average above the 3.0 that represents a letter grade of "B" and an appreciable number have an average below the "C" average that so often represents typical or acceptable performance. The level of their performance in secondary schools suggests that many adult learners may not have entered college directly from high school because of their unsatisfactory preparation. It is altogether possible that they are now enrolled in college because of later opportunities that have become available.

#### Academic Performance

The cumulative grade-point-average (GPA) of the adult learners at the college level has been computed as 2.5 and implies that the group is performing as well in college as they did in high school. A larger proportion of the group (28.6%) have a GPA above 3.0 but at least 15 percent of the group have earned grades at a level that will make it quite difficult for them to remain in college. First-quarter grades reported for the adult learners in Fall 1979 and Fall 1980 suggest that the group makes lower grades with more variation on their first efforts to resume their education. Over 20 percent make grades below a "D" and discover, no doubt, that additional effort must

be expended if they are to continue their education. At least 25 percent do well, however, and earn grades at the "B+" or "A" levels.

The quality of the adult learners' academic performance is not clearly related to their reasons for enrolling or the degree they may be seeking, but there is some suggestion that adult learners enrolling in traditional programs may not do as well as those enrolling in career-related coursework. As would be expected, the quality of learning, as reflected in the cumulative GPA, is related to the number of quarters attended, the number of credit hours attempted, and the number of credit hours earned. One out of five of the adult learners have enrolled in college somewhere for seven or more quarters, suggesting that many of those included in the study are not first-time enrollees in college but returnees. No data are available, unfortunately, on the number of adult learners who began college immediately or soon after high school graduation and dropped out before returning some years later. The number of adult learners attempting over 90 credit hours (7.8%) and earning over 90 credit hours (9.4%) suggests that returning students comprise a significant proportion of the adult learners in the study.

#### Objectives and Purposes

A large majority (68.1%) of the adult learners have been identified as enrolled in an associate of arts degree program. Twenty-two percent of the group are apparently enrolled in a degree program leading to the baccalaureate while an additional ten percent are enrolled in professional or applied fields of study. This finding is related to the large number of adult learners enrolled in two-year colleges, as opposed to four-year and university-level institutions within the University System.

The responding registrars in the study have identified a majority of the adult learners (56.3%) as having enrolled for academic purposes. This finding implies that more than half of the group are taking academic coursework that can be identified as traditional or conventional, and it suggests that many adult learners are attending college for traditional reasons. Less than two percent of the group are enrolled for avocational or special interest reasons, but almost ten percent are enrolled for coursework leading to their own personal development. Thirty-two percent of the adult learners are seeking coursework that is career-related. The proportion of the group includes, undoubtedly, the ten percent enrolled in professional or applied fields of study and many of those seeking an associate of arts degree in two-year colleges. There is no way of knowing how many of those seeking a bachelors degree have enrolled for career-related purposes.

#### PERFORMANCE ON THE SAT

The data reported by USGA registrars on SAT scores, grades, and other indices of academic progression are irregular and vary appreciably in their completeness. SAT scores are reported for 1682 adult learners in the University System of Georgia, all but twelve of the 1694 adult learners identified in the study. The sex of 30 adult learners, however, is not known and the racial/ethnic identification of seven students is unknown. The year of high school graduation is reported for 1193 adult learners (70.4%) while an additional 154 adult learners (11.4%) have met high school graduation requirements through the General Education Development Tests (GED). High school averages are available, therefore, for only 1175 (69.3%) of the group.

A total of 45 students were eliminated from the study because the age

distribution of the adult learners revealed that they had not reached their 25th birthday by the time the data were collected. Grades for the Fall 1979 session were available for 996 adult learners and grades for 1211 were available for the Fall 1980 session, but cumulative grade-point-averages were reported for only 1626 students. Although the Fall 1980 data were to include only those students entering that quarter, it is obvious that the data include an unknown number of returning F79 adult learners. It is not believed, however, that the overlap is sufficient to distort any inferences that might be drawn from the data.

Because all data were not available on all adult learners reported by the USGA registrars, the size of the subsamples varies significantly. Means, standard deviations, first-order and multiple correlation coefficients, and other statistics have been computed only when complete data were available for a particular subset or sample. This necessity has produced appreciable shrinkage in sample size for many of the variables included in the study. The smallest subset or sample for which statistics have been computed is the adult learners who are over 50 years of age; the number in that group is 22.

#### Comparison With Other Norm Groups

The 1682 adult learners for whom SAT scores are available have made an average score of 424 on the SAT-Verbal scale and an average score of 388 on the SAT-Mathematics scale. The standard deviation of 108 on the verbal scale implies greater variation than the standard deviation of 84 on the mathematics scale. As will be evident in later discussion, the differences in mean scores and variation are a function of the composition of the adult learner group in Georgia colleges.

Comparisons of the adult learners' verbal and mathematical abilities have been made with four norm groups for which comparable data are available. Frequency distributions for all five groups are shown in Appendix B, along with computed measures of central tendency and variation. The four norm groups with which the adult learner group is compared are: (1) the 1981 Admission Testing Program (ATP) National Norms, (2) the 1981 ATP Southern Region Norms, (3) the 1981 ATP Norms for the State of Georgia, and (4) the 1981 University System of Georgia Norms. In each case the norm group was chosen because of its appropriateness as a reference group that would permit a meaningful comparison of test performance.

As shown in Table 1, the verbal performance of adult learners in USGA institutions is comparable in central tendency and variation to the national population of high school students or graduates taking the SAT in 1981. When compared to regional and state norm groups, the verbal performance of adult learners may be regarded as superior. Adult learners in the USGA group have scored, on the average, 13 points higher than freshmen entering USGA institutions in the fall of 1980; 34 points higher than their fellow Georgians who took the SAT that year; and 15 points higher than other southerners who took the SAT in 1981. Because of the large size of the various groups, the differences in mean performance are statistically significant.

It may be inferred from Table 1, however, that the mean differences favoring USGA adult learners are attributable to the preponderance of women in the group and to the research finding that women often score higher on measures of verbal ability. Women in the adult learner group have scored 37 points higher than the men in verbal performance and although men have scored higher than women in each of the other norm groups for which SAT verbal scores are computed, there are few reasons not to

Table 1

Comparison of SAT Scores for USGA Adult Learners  
With National, Regional, and State Norm Groups

	NATIONAL	Regional	State	USGA	Adult Learners
<b>TOTAL GROUP:</b>					
<b>SAT-Verbal</b>					
Mean	424	409	390	411	424
S.D.	110	110	107	104	108
<b>SAT-Math</b>					
Mean	466	445	426	441	388
S.D.	117	114	112	111	84
NO.	993,672	179,912	34,088	22,572	1,682
<b>Male Learners:</b>					
<b>SAT-Verbal</b>					
Mean	430	416	399	421	401
S.D.	110	111	108	105	108
<b>SAT-Math</b>					
Mean	492	469	450	471	402
S.D.	119	118	117	118	94
<b>Female Learners:</b>					
<b>SAT-Verbal</b>					
Mean	418	403	383	402	438
S.D.	110	110	106	102	104
<b>SAT-Math</b>					
Mean	443	425	407	413	383
S.D.	109	107	104	99	78

accept the difference in mean SAT-Verbal scores as a sex difference.

The converse is seen in the performance of the various groups on the SAT-Mathematics scale. Adult learners in Georgia have not scored higher on the mathematics section of the SAT and, in fact, have scored significantly lower than any of the four norm groups with which they are compared. The size of the standard deviation of the adult learner group further suggests that it is a more homogeneous group than the other four norm groups.

A comparison of frequency distributions (in Appendix B) in Table 1 reveals a fairly consistent tendency for men to score higher than women on the mathematics section. Within the adult learner group, 17 percent of the men have scored above 500 on the mathematics section of the SAT while only nine percent of the women have done so. Such findings lead to the conclusion that as a group, adult learners in Georgia colleges are more verbally disposed to academic success than they are mathematically.

As far as measured verbal ability is concerned, adult learners could be expected to do as well as most students entering units of the University System. With respect to measured mathematical ability, however, the same favorable expectation is not in order.

#### Internal Comparisons

Performance on the SAT is related to the age, sex, and racial/ethnic identity of persons taking the test, and adult learners in the University System of Georgia have proven to be no exception. Although the social significance and the educational implications of age, sex, and racial differences are subject to endless debate, the relevance of such differences are difficult to deny. No attempt has been made in this study to attribute differences in test performance or academic progress to age, sex, or

race -- and none should be. The data used in the study are the results of an empirical survey in which the accuracy of categorical data has been dependent upon the accuracy of institutional records and the facility with which selected data could be retrieved from institutional files. As shown previously, there are gaps in the data and all analyses or interpretations of the data should be made with caution.

The means and standard deviations for high school averages (HSA), SAT-Verbal scores, SAT-Math scores, and cumulative grade-point-averages (GPA) are shown in Table 2 for the various subgroups or selected samples permissible from the collected data. Almost without exception, differences in the mean performance of adult learners are in keeping with differences observed in other studies of test performance and academic progress. Women have scores higher than men on the verbal section of the SAT and lower than men on the mathematics section. In high school the women adult learners made a half-letter-grade higher than the men. Whites have scored higher than blacks on the SAT and have received somewhat higher grades in high school.

The significance of Table 2 should be seen in the comparatively small number of black males and females who have been identified as adult learners in USGA institutions. The fact that black males have scored higher on the SAT-Math than on the SAT-Verbal may be indicative of the fields they have chosen to enter as adults. In any event, the measured abilities of black adult learners compare with those of traditional college-age students in Historically Black Institutions in much the same manner that the measured abilities of whites compare with their counterparts in traditional programs.

The break-out of age groups implies that age is not a deterrent on the verbal section of the SAT -- and it may be an asset. The same is not true of the SAT-Math,

Table 2  
Means and Standard Deviations  
for Selected Samples of Adult Learners

Sample		HSA	SATV	SATM	GPA
Total (N=1122)	M	2.56	423.73	388.05	2.49
	s	0.67	107.83	84.34	1.01
Males (n=375)	M	2.23	401.32	401.83	2.15
	s	0.61	108.44	93.52	1.01
Females (n=722)	M	2.74	438.50	383.10	2.68
	s	0.64	104.22	78.09	.96
Whites (n=994)	M	2.60	442.91	397.88	2.59
	s	0.68	100.27	82.34	.99
Blacks (n=159)	M	2.31	323.92	325.64	1.97
	s	0.60	84.32	60.56	1.02
Male Whites (n=298)	M	2.24	424.44	415.55	2.20
	s	0.61	103.36	89.81	1.02
Male Blacks (n=65)	M	2.13	317.29	330.48	1.88
	s	0.56	78.48	67.24	1.02
Female Whites (n=644)	M	2.76	451.65	389.84	2.77
	s	0.64	97.48	77.34	.92
Female Blacks (n=70)	M	2.53	332.03	325.76	1.98
	s	0.64	88.46	56.31	.98
Ages 25 - 30 (n=516)	M	2.49	411.78	400.71	2.37
	s	0.65	106.09	90.10	1.02
Ages 31 - 50 (n=582)	M	2.61	432.71	377.03	2.60
	s	0.69	108.60	77.53	1.00
Age Over 50 (n=22)	M	2.83	456.88	397.09	2.50
	s	0.54	93.65	82.81	.92

Means and Standard Deviations (Continued)

Sample		HSA	SATV	SATM	GPA
<b>Credits Earned:</b>					
Less Than 16 Cum. Hours (n=411)	M	2.51	414.66	373.66	2.05
	s	0.67	106.44	79.38	1.26
16 - 25 Cum. Hours (n=151)	M	2.54	425.51	383.78	2.60
	s	0.67	110.13	85.99	.90
Over 25 Cum. Hours (n=558)	M	2.60	429.71	399.10	2.75
	s	0.68	107.98	85.83	.71
<b>Enrolling For:</b>					
Academic Reasons (n=383)	M	2.60	413.14	381.18	2.53
	s	0.63	111.50	83.55	1.02
Career Reasons (n=232)	M	2.58	428.40	385.31	2.60
	s	0.65	104.30	83.38	.99
<b>Institutional Level:</b>					
University (n=100)	M	2.71	496.47	450.52	2.45
	s	0.68	100.68	81.04	.82
Four Year Schools (n=466)	M	2.61	438.78	404.05	2.49
	s	0.70	103.58	84.30	1.01
Two Year Schools (n=554)	M	2.47	394.63	363.36	2.51
	s	0.66	104.84	76.95	1.01

Means and Standard Deviations (Continued)

Sample		HSA	SATV	SATM	GPA
<b>Type of Degree:</b>					
Associate (n=547)	<i>M</i>	2.55	410.70	375.08	2.54
	<i>s</i>	0.64	104.21	79.70	1.01
Bachelors (n=204)	<i>M</i>	2.67	463.19	424.79	2.48
	<i>s</i>	0.72	102.06	90.35	1.02
Applied Fields (n=91)	<i>M</i>	2.73	449.76	405.20	2.49
	<i>s</i>	0.63	99.04	75.56	.88
Enrolled in Developmental Studies (n=85)	<i>M</i>	2.28	351.28	327.31	1.97
	<i>s</i>	0.62	82.03	51.41	.94
School A (Four Year) (n=108)	<i>M</i>	2.21	439.45	417.74	2.39
	<i>s</i>	0.72	109.59	91.26	1.05
School C (Two Year) (n=154)	<i>M</i>	2.55	436.08	382.06	2.40
	<i>s</i>	0.67	96.48	68.13	.98

however, and the differences in mean performance for the age groups suggest once again that mathematical ability is linked more directly to coursework in high school than verbal ability might be. The appreciable verbal score recorded for the over 50 group and their higher high school average are a function, most likely, of the small sample size and the selectivity of persons attending college at that age.

When compared by levels of academic progress, the mean performance of adult learners in high school grades and test scores hints at the continuing selectivity of higher education. Those who have completed the better part of an academic year have scored higher than those who have completed less than a quarter. Those who have completed an intermediate number of credit hours fall in between on both high school grades and SAT scores.

Adult learners who enroll for career reasons apparently have a slight advantage over those who enroll for academic reasons. The slight advantage in measured ability is not sustained, however, by better high school preparation, in so far as high school grades are concerned. No such advantage is borne out by the higher SAT scores of those enrolled in a bachelors degree program, as compared to those enrolled in a professional or applied field of study. As found in other studies at other times, students enrolled in two-year colleges and seeking an associate of arts degree score lower, on the average, in the kinds of measured abilities represented by the SAT. Once again, the adult learners in USGA institutions prove no exception.

More significant for purposes of this study, however, may be the finding that relatively few of the adult learners in Georgia are enrolled in university-level institutions. The level of the mean SAT scores is suggestive that few concessions have been made in admitting the adult learners. The magnitude of the standard deviation,

however, suggests appreciable variation within the group of adult learners who are admitted to university-level institutions in the University System.

At least 85 of the adult learners in Georgia colleges were identified as presently enrolled in developmental studies. This implies that these students did not meet the admission standards of the institution and were, at the time of the survey, taking remedial or developmental work in preparation for admission to regular coursework. Unfortunately, the data do not permit further information about the number of adult learners required to take developmental courses or the extent of their academic difficulties. Neither is the degree objective or reason for enrolling in college known for the 85 students in developmental studies.

Two units of the University System of Georgia reported a sufficiently large number of adult learners to permit separate analyses of their SAT scores and grades. One college is one of the larger four-year institutions in the University System while the other is one of the larger two-year institutions. Also shown in Table 2, therefore, are the means and standard deviations for adult learners in the two colleges. Adult learners in the four-year institution have scored slightly higher on the SAT-Mathematics section and there are hints of somewhat better verbal ability on the SAT-Verbal section, but there is no apparent difference in academic performance for the two institutions, as reflected in college grades. Adult learners entering the two-year institution may have done somewhat better as students in high school. The purpose of the separate analyses, however, was not to compare two-year and four-year institutions but to see if the prediction of college grades within the University System or across institutions differs from the prediction of grades within institutions, a matter to be discussed later.

## PREDICTIVE EFFICIENCY OF THE SAT

The SAT scores of adult learners in the University System of Georgia correlate with high school grades and college grades in much the same manner that such variables correlate for the traditional college-age population. The correlational matrix reproduced in Table 3 shows a coefficient of +.31 for the correlation between SAT-Verbal scores and cumulative grade-point-averages (GPA) for adult learners while a coefficient of +.26 is shown for SAT-Math scores and college grades. The coefficients of correlation for SAT-Verbal scores and high school grades, and for SAT-Math scores and high school grades, are +.27 and +.24, respectively.

The correlation of SAT scores and college grades is somewhat lower than the coefficients of +.40 and +.39 computed for the University System of Georgia in the years 1975-1979. They compare somewhat more favorably, however, with the +.37 coefficient reported for both verbal and math scores in the 1980-1981 norms booklet of the University System, the latest year for which norms data have been reported.

As consistently shown in the 23 years for which the SAT has been used in the University System, high school averages correlate somewhat higher with grade-point-averages than verbal and math scores do (See Appendix C). In 1980-1981 high school grades correlated +.48 with college grades at the freshman level in the University System. A similar finding for adult learners is seen in Table 3 where their high school grades correlate +.36 with college grades.

Another consistent experience in the use of SAT scores in the State of Georgia is the higher coefficients of correlations found for female students. Both the verbal and math scores of the SAT correlated +.43 for female students in 1980-1981, as

Table 3

## Correlational Matrix for SAT/Adult Learner Variables

Variable	Sex	Ethnic Group	Age	SATV	SATM	Yr. HS Grad.	HSA	GPA <sub>F79</sub>	GPA <sub>AY</sub>	GPA <sub>F80</sub>	GPA <sub>Cum.</sub>
Sex		-.11	-.16	-.16	-.11	.23	-.36	-.21	-.21	-.17	-.25
Ethnic Group	-.11		.08	.40	.29	-.12	.15	.24	.25	.16	.21
Age	-.16	.08		.10	-.13	-.77	.16	.11	.15	.10	.09
SATV	-.16	.40	.10		.52	-.18	.27	.21	.20	.22	.31
SATM	.11	.29	-.13	.52		.09	.24	.16	.14	.14	.26
Yr. HS Grad.	.23	-.12	-.77	-.18	.09		-.14	-.13	-.18	-.13	-.16
HSA	-.36	.15	.16	.27	.24	-.14		.26	.25	.34	.36
GPA <sub>F79</sub>	-.21	.24	.11	.21	.16	.13	.26		.76	.33	.64
GPA <sub>AY</sub>	-.21	.25	.15	.20	.14	-.18	.25	.76		.42	.78
GPA <sub>F80</sub>	-.17	.16	.10	.22	.14	-.13	.34	.33	.42		.66
GPA <sub>Cum.</sub>	-.25	.21	.09	.31	.26	-.16	.36	.64	.78	.66	
Qtrs. Att.	.07	-.01	.00	-.13	.00	-.02	-.01	.19	.26	.13	.19
Hours Att.	.04	.03	-.05	.03	.15	.03	.06	.22	.25	.22	.21
Hours Earned	.01	.06	-.06	.06	.18	.00	.08	.27	.29	.19	.27
Degree	-.02	.05	-.04	.18	.20	.07	.10	-.14	-.16	-.03	-.03
Acad.	-.02	.02	.09	.10	.14	.16	.17	.06	.05	.13	.06
Avoc.	-.01	.03	.09	.12	.15	.17	.15	.03	.03	.08	.05
Pers. Devel.	-.03	.04	.10	.12	.15	.15	.16	.06	.05	.10	.06
Career	-.01	.03	.09	.13	.15	.15	.16	.05	.03	.11	.06
Mean	.34	4.37	33	424	388	1967	2.55	2.28	2.42	2.24	2.49
SD	.47	1.43	6.58	108	84	6.57	.67	1.34	1.14	1.36	1.01
N	1664	1687	1694	1602	1682	1193	1175	996	962	1211	1626

Correlational Matrix for SAT/Adult Learner Variables

Variable	Qtrs. Att.	Hours Att.	Hours Earned	Degree	Acad.	Avoc.	Pers. Devel.	Career
Sex	.07	.04	.01	-.02	-.02	-.01	-.03	-.01
Ethnic Group	-.01	.03	.06	.05	.02	.03	.04	.03
Age	.00	-.05	-.06	-.04	.09	.09	.10	.09
SATV	-.13	.03	.06	.18	.10	.12	.12	.13
SATM	.00	.15	.18	.20	.14	.15	.15	.15
Yr. HS Grad.	-.02	.03	.00	.07	.16	.17	.15	.15
HSA <sup>1</sup>	-.01	.06	.08	.10	.17	.15	.16	.16
GPA <sub>F79</sub>	-.19	.22	.27	-.14	.06	.03	.06	.05
GPA <sub>AY</sub>	-.26	.25	.29	-.16	.05	.03	.05	.03
GPA <sub>F80</sub>	.13	.22	.19	-.03	.13	.08	.10	.11
GPA <sub>Cum.</sub>	.19	.21	.27	-.03	.06	.05	.06	.06
Qtrs. Att.		.78	.78	-.17	-.10	-.10	-.08	-.09
Hours Att.	.78		.91	.03	.09	.09	.10	.10
Hours Earned	.78	.91		.01	.06	.07	.08	.07
Degree	-.17	.03	.01		.17	.17	.15	.17
Acad.	-.10	.09	.06	.17		.95	.95	.90
Avoc.	-.10	.09	.07	.17	.95		.99	.97
Pers. Devel.	-.08	.10	.08	.15	.95	.99		.96
Career	-.09	.10	.07	.17	.90	.97	.96	
Mean	4.29	38.8	39.0	1.41	.64	.30	.35	.49
SD	2.59	33.4	36.3	.66	1.60	1.60	1.60	1.61
n	1311	1684	1680	1224	1694	1694	1694	1694

compared to +.34 (SAT-V) and +.39 (SAT-M) for male students. For adult learners, the coefficients of correlations are +.31 (SAT-V) and +.33 (SAT-M) for females and +.22 (SAT-V) and +.26 (SAT-M) for males.

#### Incremental Effectiveness

The use of SAT scores in the prediction of academic grades has been most effective when used in combination with high school grades, and such use has been consistently advocated by the College Board (See Angoff, 1971). The use of the SAT within the University System of Georgia has been predicated on the basis that verbal and math scores would be combined with high school averages to produce a higher degree of predictive efficiency than either HSA or SAT scores can produce separately. With only occasional exceptions, the data for 23 years in the University System demonstrate that the best single predictor of academic performance at the college level is the high school average of entering students. Use of the SAT in conjunction with the HSA, however, produces a substantial increment in predictive efficiency. The average gain in predictive efficiency for 23 years has been remarkably stable at approximately six percentage points for male students and between seven and eight percentage points for female students. In brief, use of the SAT for the prediction of academic performance is best justified when SAT scores are used in combination with high school grades or other indices of previous academic achievement. It is the incremental effectiveness of the SAT that makes it useful in the University System of Georgia and the most likely reason that the SAT has been used for 23 years.

The incremental effectiveness of the SAT in predicting college grades for adult learners is readily seen in Table 4. There standardized regression weights are shown for

Table 4

Comparison of Standardized Regression Weights for Selected Samples of Adult Learners

Sample	Standardized Regression Weights For:			R
	HSA	SAT-V	SAT-M	
Total	.2928	.1901	.0925	.4304
Sex: Males	.1771	.1616	.0988	.3121
Females	.2719	.1427	.1798	.4440
Race: White	.3281	.1333	.0871	.4205
Black	.0839	.2581	-.0414	.2590
Age: 25 - 30	.3004	.1304	.1291	.4359
31 - 50	.2834	.1923	.1025	.4184
over 50	-.3375	.5235	.5438	.7168
Hours Earned:				
0 - 15	.3116	.1782	.0405	.4105
16 - 25	.3206	.1295	.0898	.4181
over 25	.2919	.2661	.0887	.4967
Purpose for Enrolling:				
Academic	.2698	.1358	.1281	.3813
Career	.2781	.1921	.0681	.4128
Institutional Level:				
University	.1593	.0864	-.0576	.2159
Four Year	.3307	.2520	.0920	.4901
Two Year	.2772	.2045	.1922	.4624
Degree:				
Associate	.2687	.1456	.1740	.4315
Bachelors	.2783	.2291	.1815	.4959
Applied Fields	.2729	.1915	-.0999	.3394
Developmental Studies	.3754	.2403	.1358	.4084

HSA, SAT-Verbal, and SAT-Math for the total group and for various subsamples of adult learners. For the total group, high school grades obviously contribute the most to the prediction of GPA, with SAT-V the second most significant contributor and SAT-M a relatively small but nonetheless significant third contributor. All standardized regression weights are statistically significant at the .01 level of confidence and the multiple correlation coefficient for the three predictor variables differentially weighted is a respectable +.43, accounting for at least 18 percent of the variance of academic performance.

When broken down by sex, race, age, hours of academic credit earned, reasons for enrolling, institutional level, and degree program, the data for adult learners display a pattern that varies only slightly. Almost without exception, the high school average carries the largest portion of the prediction burden, followed in turn by verbal and mathematical ability. Notable exceptions are blacks for whom the SAT-Verbal score makes a more substantive contribution than high school grades and the weight assigned mathematical ability is negative. This finding implies that not only does the SAT-Verbal predict academic performance for adult learners who are black but it predicts better than the high school grades of such learners.

Another exception is the negative weight given HSA in predicting grades for adult learners over 50 years of age. The smallness of this subsample, however, is sufficient explanation for the unexpected finding and both the negative weight for HSA and the high multiple correlation of +.71 should be regarded with suspicion. This particular subsample is the only occasion on which HSA has been assigned a negative weight whereas the mathematical ability tapped by SAT-M appears as a negative contributor on three occasions.

Reading the multiple correlation coefficients as the most efficient prediction to be made of academic performance, there is much in Table 4 to suggest that the grades of adult learners can be predicted more accurately if: (a) we use a GPA based on at least 25 hours of earned academic credit, (b) we predict GPA within institutional level, and (c) if we give consideration to the degree objectives of the adult learners. The relative size of the multiple correlation coefficients for sex and race further suggests that these, too, could be considered in predicting the academic performance of adult learners.

The advantages of predicting GPA by institutional level are only partially supported by the University System's experience in predicting grades for traditional college-age freshmen. Multiple regression analyses over the 23-year period suggest that grades may be "more predictable" in four-year colleges than two-year or university-level institutions, but the gains in predictive efficiency are slight. Only since 1975 has there been evidence that the predictability of grades in the State's three Historically Black Institutions (HBIs) may be less efficient than the predictability of grades in the Predominantly White Institutions (PWIs). Prior to 1975 or thereabouts, multiple correlation coefficients for the HBIs were quite comparable to multiple correlation coefficients for the PWIs over a span of 16 years (See Appendix C).

The predictability of academic performance for adult learners and the use of SAT scores has been interpreted in a somewhat different manner in Table 5. There the multiple coefficients of determination are presented for HSA, SAT-V, and SAT-M as each is added to the prediction equation. So that the relative weights of HSA, SAT-V, and SAT-M can be seen across selected samples of adult learners, unstandardized regression weights, or b-weights, are given for the three predictor variables and

Table 5

Multiple Coefficients of Determination  
for Selected Samples of Adult Learners

Sample	(1)HSA	R-Squared For: (2)SATV + (3)SATM		b-Weight	F-Ratio	p-Value
Total (N=1122)	.1306	.1790	.1853	(1) .4405	106.39	.0001
				(2) .1787	34.76	.0001
				(3) .1111	8.62	.0034
Males (n=375)	.0911	.0548 <sup>1</sup>	.0974	(1) .2943	12.11	.0006
				(2) .1513	7.18	.0077
				(3) .1073	2.60	.1074
Females (n=722)	.1285	.1972	.1833 <sup>2</sup>	(1) .4065	58.20	.0001
				(2) .1314	12.41	.0005
				(3) .2210	20.23	.0001
Whites (n=994)	.1437	.1708	.1768	(1) .4803	115.31	.0001
				(2) .1317	15.85	.0001
				(3) .1048	6.90	.0088
Blacks (n=159)	.0657	.0598 <sup>1</sup>	.0671	(1) .1421	1.05	.3062
				(2) .3131	8.28	.0046
				(3) -.0699	.23	.6353
Male Whites (n=298)	.0938	.0538 <sup>1</sup>	.1008	(1) .3105	11.20	.0009
				(2) .1571	6.28	.0128
				(3) .1112	2.28	.1318
Male Blacks (n=65)	.0290	.0450	.0536	(1) .3356	1.78	.1817
				(2) .2473	1.57	.2142
				(3) -.1828	.56	.4553
Female Whites (n=644)	.1298	.1684	.1647 <sup>2</sup>	(1) .4216	59.02	.0001
				(2) .0664	2.90	.0892
				(3) .1976	15.87	.0001
Female Blacks (n=70)	.0891	.0716 <sup>1</sup>	.0899	(1) .2162	1.33	.2533
				(2) .2638	2.36	.1295
				(3) .0613	.06	.8050

Multiple Coefficients of Determination (continued)

Sample	R-Squared For:			b-Weight	F-Ratio	p-Value
	(1)HSA	(2)SATV	(3)SATM			
Ages 25 - 30 (n=516)	.1422	.1782	.1900	(1) .4686	54.68	.0001
				(2) .1255	7.48	.0064
				(3) .1463	7.47	.0065
Ages 31 - 50 (n=582)	.1175	.1678	.1751	(1) .4107	48.83	.0001
				(2) .1770	16.98	.0001
				(3) .1321	5.16	.0234
Age Over 50 (n=22)	.5138	.3370 <sup>1</sup>	.4463 <sup>2</sup>	(1) -.5815	2.64	.1208
				(2) .5160	10.99	.0036
				(3) .6062	6.86	.0169
<b>Credits Earned:</b>						
Less Than 16 Cum. Hours (n=411)	.1338	.1673	.1685	(1) .5907	41.86	.0001
				(2) .2118	9.93	.0017
				(3) .0646	.55	.4570
16 - 25 Cum. Hours (n=151)	.1439	.1690	.1748	(1) .4308	16.72	.0001
				(2) .1061	1.98	.1610
				(3) .0942	1.04	.3093
Over 25 Cum. Hours (n=558)	.2402	.1515 <sup>1</sup>	.2467	(1) .3076	61.47	.0001
				(2) .1760	42.02	.0001
				(3) .0738	4.78	.0291
<b>Enrolling For:</b>						
Academic Reasons (n=383)	.1012	.1338	.1454	(1) .4360	26.40	.0001
				(2) .1242	5.30	.0219
				(3) .1563	5.13	.0241
Career Reasons (n=232)	.1169	.1665	.1704	(1) .4277	20.53	.0001
				(2) .1833	8.23	.0045
				(3) .0813	1.06	.3043

Multiple Coefficients of Determination (continued)

Sample	R-Squared For:			b-Weight	F-Ratio	p-Value
	(1)HSA	(2)SATV	(3)SATM			
<b>Institutional Level:</b>						
University (n=100)	.0373	.0427	.0466	(1) .2397	3.76*	.0553
				(2) .0812	.83	.3646
				(3) -.0692	.39	.5312
Four Year Schools (n=466)	.1658	.2344	.2402	(1) .4975	59.87	.0001
				(2) .2368	22.10	.0001
				(3) .1106	3.56	.0598
Two Year Schools (n=554)	.1270	.1897	.2138	(1) .4170	45.15	.0001
				(2) .1922	21.41	.0001
				(3) .2309	16.93	.0001
<b>Type of Degree:</b>						
Associate (n=547)	.1200	.1862	.1706 <sup>2</sup>	(1) .4251	42.63	.0001
				(2) .1406	10.43	.0013
				(3) .2197	15.56	.0001
Bachelors (n=204)	.1532	.2244	.2459	(1) .3919	16.86	.0001
				(2) .2281	8.49	.0040
				(3) .2041	5.72	.0177
Applied Fields (n=91)	.0756	.1038	.1152	(1) .3812	8.76	.0039
				(2) .1740	3.78	.0550
				(3) .1165	1.12	.2919
Enrolled in Develop- mental Studies (n=85)	.0976	.1493	.1668	(1) .5735	12.93	.0006
				(2) .2777	5.11	.0264
				(3) .2505	1.73	.1924

1. Entered first.
2. Entered second.

are accompanied by their respective F-ratios and p-values.

The findings presented in Table 5 are suggestive of the extent to which we can account for the academic performance of adult learners in terms of previous academic achievement, verbal ability, and mathematical ability -- as each is reflected, of course, in high school grades and SAT scores. The data on USGA adult learners have been analyzed in the manner shown and not with stepwise regression techniques that would assign relative weights to the factors of sex, race, age, credits earned, reasons for enrolling, institutional level, and degree objective. The data have been analyzed in this manner because they can be, it is believed, more readily interpreted.

Beginning with the total group of 1122 adult learners for which complete data were available, Table 5 shows that the high school average accounts for 13 percent of the variance observed in academic performance at the college and as reflected in GPA earned. When the verbal abilities of adult learners are considered, an additional five percent of the variance is explained -- and when mathematical abilities are considered, in conjunction with HSA and SAT-V, at least 18.5 percent of the adult learners' performance can be explained. The contribution of all three predictor variables or sources of variance is statistically significant at the .01 level of confidence.

Comparisons by sex, race, and race/sex combinations show that the relative explanatory value of HSA, SAT-V, and SAT-M varies according to the subgroup but with a pattern that is stable. On five occasions the SAT-Verbal has been entered first in the prediction equation and accounts for the initial portion of the variance. On four occasions the SAT-Math has been entered second, signifying that it makes a more substantive contribution to explaining the variance than either the high school average or the SAT-Verbal on that particular occasion. The former is true of males,

blacks, male whites, adult learners over 50 years of age, and learners earning over 25 hours of credit. The latter is true of females, female whites, learners enrolled for an associate degree, and learners over 50 years of age. Only in the case of learners over 50 years of age are both the SAT-Verbal and the SAT-Math entered before HSA -- another finding that may be attributed to the smallness of that particular sample.

The analyses presented in Table 5 suggest, nonetheless, that there are occasions on which it "does not pay" to use the adult learners' SAT-M scores in explaining their academic performance. For the 159 adult learners in the study who are black, this would seem to be the case. The same may be true for adult learners earning less than 25 hours credit, those enrolling for career reasons, and those enrolling in a university or in developmental studies.

More important for this study, however, may be the suggestive leads that are given about the kinds or levels of academic performance permitting explanation with HSA, SAT-V, and SAT-M. The data clearly suggest that we can account for a larger portion of the variance in GPA when we use HSA, SAT-V, and SAT-M on such groups of adult learners as those earning over 25 hours of academic credit, attending four-year institutions, and seeking a bachelors degree. In each of these subgroups, the combination of HSA, SAT-V, and SAT-M accounts for approximately one-fourth of the variance observed in the GPAs of the adult learners. Had the subgroup of adult learners who are over 50 years of age been larger -- and more representative -- there are possibilities of explaining 50 percent of their variance in grades.

Comparing the multiple coefficient of determination in Table 5 with the .3492 computed for the University System of Georgia for the years 1975-1979, there are reasons to conclude that it is more difficult to explain the variance of adult learners

than it is for traditional college-age freshmen. There is the further implication, however, that more variance can be explained for adult learners by considering other factors or conditions that may affect their learning performance. If we can account for 35 percent of the variance in college grades for traditional age groups, there are grounds for encouragement in the finding that high school grades and SAT scores can account for as much as 25 percent of the variance of adult learners.

Comparing the multiple coefficient of determination for the total group of adult learners (.1853) with the other coefficients reported in Table 5, it is possible to identify some subgroups for whom the combined use of HSA and SAT are not promising. In particular, such might be the case for male whites and male blacks, as well as female blacks. Only in the case of female whites where the number is more appreciable do we find a proportion of the variance significantly explained by high school grades and measured abilities.

The gist of Tables 4 and 5 might well be that the combined uses of high school grades and SAT scores for the prediction of college grades for adult learners is similar in many respects to the predictability or predictive efficiency of grades for traditional college-age students -- but it may be possible to improve that predictability or predictive efficiency by considering the extent of academic credits on which the GPA of adult learners is based and the degree objectives they are seeking at the four-year college level.

#### Predicting Within Institutions

The statistical significance of the coefficients derived for adult learners in the University System benefits appreciably from the sample size that is permissible when

analyses are made across institutions. As mentioned previously, two units of the University System reported data on a sufficiently large group of adult learners to permit analyses within institutions. In Table 6 an abbreviated matrix is presented for the total group of adult learners and the two colleges. These data should throw further light on the predictive efficiency of the SAT for adult learners at the institutional level.

As shown, the multiple correlation coefficients for HSA, SAT-V, and SAT-M are noticeably higher for Colleges A and C, and there are hints that in each case, HSA, SAT-V, and SAT-M correlates higher with grades when the correlation is restricted to a single institution. This finding may be a function of more uniform grading practices within institutions, but it might also be a result of aggregating data from a highly diverse group of institutions. In any event, there are numerous and readily acceptable reasons for deriving prediction equations at the institutional level and not at the system level. At no time have systemwide equations been used in the University System of Georgia.

Table 7 presents the multiple coefficients of determination and regression weights for such other comparisons as might be desired. It will be quickly noted that a combination of HSA, SAT-V, and SAT-M can account for 25 percent of the variance in academic performance at College A and 19 percent of the variance at College C. It may or may not be relevant that SAT-V was entered first in the prediction equation for College A and SAT-M was entered second for College C. Relevance is more likely in the fact that 64 percent of the adult learners in College A are female and 76 percent of those in College C are. In both colleges there is no correlation between sex and SAT-V but a significant, positive correlation is noted between sex and SAT-M, favoring

Table 6

Correlations of Selected Variables  
with Cumulative GPA

Sample	Sex	Age	Year of HS Graduation	Race	HSA	SATV	SATM	R
Total (N=1626)	-.25	.09	-.16	.21	.36	.31	.26	.4304
College A (N=235)	-.28	.09	-.21	.25	.40	.41	.30	.5063
College C (N=194)	-.24	.07	-.10	.21	.38	.32	.31	.4608

HSA + SAT-V + SAT-M

Table 7

Multiple Coefficients of Determination and Standardized Regression Weights for Selected Institutions

Sample	R-Squared For:			b-Weight
	(1) HSA	(2) SATV	(3) SATM	
College A (Four-Year)	.2523	.2061 <sup>1</sup>	.2563	(1) .3790 (2) .4023 (3) -.0958
College C (Two-Year)	.1455	.2123	.1914 <sup>2</sup>	(1) .4523 (2) .1592 (3) .2335

Sample	Standardized Regression Weights For:			R
	HSA	SATV	SATM	
College A (Four-Year)	.2598	.4187	-.0830	.5063
College C (Two-Year)	.3115	.1574	.1630	.4608

1. Entered into regression equation first.
2. Entered second.

male students. For SAT-V in both institutions there is significant, positive correlation with age.

In brief, the inter-correlations of adult learner variables at the institutional level suggest that grades within institutions are more easily or accurately predicted than grades across institutions. The correlations for Colleges A and C are more comparable to those computed for the total freshman class in 1980-1981, but for these two particular institutions, adult learners constitute a larger proportion of the entering freshman group.

#### Without High School

At least 154 adult learners in the University System of Georgia were admitted on the basis of GED scores which they submitted in lieu of high school diplomas. The number was judged sufficient for a separate correlational analysis and an abbreviated matrix is presented in Table 8. There it may be seen that as a subgroup, the students admitted by GED tests have scored somewhat lower on both the verbal and math sections of the SAT. As a group, they are two years older than the total sample but the sex and race composition of the two groups is virtually identical.

The cumulative grade-point-averages of the group admitted by GED suggest that they are experiencing some difficulty in maintaining the academic standards of their institutions. The average GPA is 2.04, as compared to an average of 2.49 computed for the total group. As a group, they have been enrolled for almost four quarters and have earned credit for 30 academic hours.

Most of the coefficients presented in Table 8 are noticeably low. It may be particularly informative, therefore, to learn that both SAT-V and SAT-M correlate

Table 8

Correlation Matrix, Means and Standard Deviations  
for Adult Learners Admitted by GED Tests

Variable	Sex <sup>1</sup>	Ethnic Group	Age	SATV	SATM	GPA <sub>Cum.</sub>	Qtrs. Enrolled	Cum. Hours	Acad.	Career
Sex		-.11	-.14	.02	-.16	-.26	.08	.05	.01	.02
Ethnic Group	-.11		-.14	.40	.20	.17	-.05	.05	-.24	-.07
Age	-.14	.14		.04	-.19	.13	-.08	-.10	-.03	-.18
SATV	.02	.40	.04		.52	.32	-.08	.00	-.14	-.14
SATM	.16	.20	-.19	.52		.24	.08	.16	-.16	.03
GPA <sub>Cum.</sub>	-.26	.17	.13	.32	.24		.29	.45	.17	.00
Qtrs. Enrolled	.08	-.05	-.08	-.08	.08	.29		.81	.00	.33
Cum. Hours	.05	.05	-.10	.00	.16	.45	.81		.01	.37
Acad.	.01	-.24	-.03	-.14	-.16	.17	.00	.01		-.23
Career	.02	-.07	-.18	-.14	.03	.00	.33	.37	-.23	
Mean	.33	4.37	35	401	358	2.04	3.85	28.95	.32	.22
SD	.47	1.45	7	98	65	1.03	2.49	30.84	.47	.42
n	154	154	154	154	154	140	154	150	154	154

<sup>1</sup> Sex was coded 0 for females and 1 for males.

significantly with GPA for those admitted by GED. As would be expected, the verbal section of the SAT correlates higher with grades than the mathematics section does. And as shown for the total group of adult learners, verbal ability is related to race or ethnic group and mathematical ability is related to sex. Also relevant, perhaps, is the small standard deviation computed for SAT-M, a finding that suggests appreciable homogeneity in mathematical ability and the possibility that almost no member of the group has scored well on the mathematics scale.

## CONCLUSIONS AND IMPLICATIONS

The performance of adult learners on standardized admissions tests to college has been a matter about which relatively little is known. Compilation of SAT scores for a sample of adult learners in the 1979-1980 ATP Guide for High Schools and Colleges has indicated that older college students score higher on the verbal section of the SAT than their younger classmates but lower on the mathematics section. Indices of academic performance at the college level were not available for this sample, however, and no inferences could be drawn about the predictive efficiency of the SAT for students who are 25 years of age or older. The study reported here has been conducted with an appreciably large sample of adult learners in the University System of Georgia because the SAT is required of all entering freshmen and until the summer of 1982, no arrangements were made for the provisional admission of applicants who are older adults and several years removed from their secondary preparation.

All subjects in the study were identified by registrars of the various units of the University System and the data reported for analysis included only such information as could be retrieved from institutional records. The specific data requested was: (1) age, (2) sex, (3) race or ethnic group, (4) SAT scores, (5) year of high school graduation, (6) high school average, (7) grade-point-average for the fall quarter of 1979 -- if the student entered at that time, (8) grade-point-average for the fall quarter of 1980 -- if the student entered then, (9) grades for the first academic year, (10) cumulative grade-point-average for all coursework completed by the student, (11) the number of quarters attended, (12) the number of hours attempted, (13) the number of hours credit earned, (14) the degree program in which the student enrolled, and

(15) the student's ostensible reason for enrolling -- whether for academic, avocational, career, or personal development reasons.

As is typical of such summary data, the information reported for individual students was often incomplete. The number of adult learners for which correlational statistics could be computed ranged from 1694 for age (the variable defining subjects for inclusion in the study) to 962 for academic year grades (a variable duplicated for many students by their cumulative grade-point-average). Analysis of the reported data for variously defined subgroups resulted in further shrinkage of sample sizes, the smallest being adult students who were over 50 years of age (n=22). Despite these limitations, all analyses have been informative and their results give insight into the academic performance of adult learners in a statewide system of public higher education.

Descriptive statistics for the total study group suggest that the subjects may not be adult learners as much as they are merely students who are older. Entry to higher education has apparently been delayed for many reasons, and a possible source of confusion in the study group is the number of "returning" students. In brief, there was no way of identifying students who might have entered another institution after completing high school, attended for a quarter or more, dropped out, and then re-entered college in one of the quarters for which the study sample was drawn.

Conceding the limitations of the study, there are numerous conclusions that would seem to be in order. An appreciable number of older students are seeking education at the postsecondary level and they are performing acceptably well in a diversity of academic programs. Many of these students are not the best students in their respective institutions but they are maintaining respectable academic standards

and will, in all probability, realize the personal goals and plans that have brought them on campus.

Displeasure is more to be expressed at the finding that male whites, male blacks, and female blacks do not participate at the rate of female whites. There is much to suggest that opportunities for adult learning are insufficiently taken by many adults who could benefit from further or continued education. In much the same manner, it is possible that educational opportunities for learners over 40 may go untaken. It requires no audacity to conclude that "a learning society" has not yet been established for Georgia citizens and residents who are in their "middle years."

No evidence has been obtained that the SAT is a deterrent to adult learning, but there is a possibility that the requirement of a nationally administered, standardized admissions test might be. Adults long absent from formal instruction might indeed be reluctant to take a test obviously designed for graduating high school seniors. If so, the changes in systemwide policies that permit provisional admission for older adults should reduce their reluctance to apply and increased participation should be evident as a result of the policy change.

In the meantime, the adult learners currently enrolled in Georgia colleges have demonstrated verbal abilities that compare favorably with those of other students within the University System, the State of Georgia, and the Southern Region. Age and absence from schooling have not diminished vocabulary and reading comprehension, as those competencies are measured by the SAT. As they are much inclined, college faculties prefer that adult learners bring exceptional skills to the classroom, but no cause-for-alarm is supplied by the mean SAT-Verbal score for the total group.

The mathematical abilities of adult learners, however, do suggest long absence

from classroom instruction. Aided and abetted by a cultural difference that penalizes many women learners, the competence of USGA adult learners in mathematics implies that remedial or developmental coursework is an academic fact of life when quantitative skills are necessary for subject matter mastery. Had male learners constituted a larger portion of the adult learner sample, it is possible that the average score would have been higher. The average SAT-Math score for males, however, does not suggest that it would be impressively higher.

As to the central question in the study, the usefulness of the SAT in predicting the academic performance of adult learners must receive a qualified answer. Both verbal and math scores correlate significantly with the grades of adult learners, but the coefficients of those correlations do not match what is customarily found in traditional college-age populations. The cumulative grade-point-average appears as a more predictable index of academic performance than first-quarter grades, and there is a hint or two in the findings that adult learners do experience some initial difficulty in re-adjusting to instructional requirements. The University System has long had a policy of computing first-year GPA on a minimum of 25 credit hours, and such a policy is in order for adult learners.

The usefulness of the SAT in predicting adult learning lies, as it usually does, in the incremental effectiveness of verbal and math scores when they are used in conjunction with high school grades. When weighted differentially, the high school average, SAT-Verbal, and SAT-Math produce a multiple correlation coefficient of +.43 with the cumulative GPA of adult learners. The relationship can account for almost 19 percent of the variance observed in college grades. Comparable figures for the traditional college-age population in USGA institutions are a multiple correlation of

+0.59 and a multiple coefficient of determination of +0.3481, values significantly different from those computed for adult learners.

It is thus relevant that in the case of adult learners having no recorded high school average -- i.e. those admitted on the basis of GED tests -- verbal and math scores on the SAT correlate +0.32 and +0.24 with GPA. These coefficients are almost identical with those computed for the total group. In other words, the best single predictor of college grades continues to be the student's previous academic record but the prediction of academic performance can be improved by including measures of verbal and mathematical ability. When previous academic records are not available, it is most relevant that the correlation of SAT scores and college grades are not affected.

Analyses of SAT scores and grades by age, sex, race, level of institution, credits earned, and reasons for enrolling have suggested quite strongly that the predictability of adult learning can be improved by specification of other characteristics that affect academic performance. In other words, the grades of adult learners should be predicted within institutions and within programs, wherever it is advantageous to do so. If numbers permit, further improvement might be gained by deriving prediction equations by age, sex, and race. But most assuredly, verbal and math scores on the SAT should be used differentially. Admission directors, registrars, and testing agencies that combine SAT-V and SAT-M for a "total score" on the SAT are destroying valuable information about the learning competencies of learners. The verbal/linguistic and mathematical/quantitative dimensions of education have been evident since the Trivium and Quadrivium of the Middle Ages. The individual differences of students continue to account for "the lion's share" of variance in learning.

A multiple coefficient of .1853 gives pause to both optimists and pessimists.

For the former, it may be remarkable that previous academic records, combined with measures of verbal and mathematical ability, can account for "almost 20 percent" of the adult learner's grades at the college level. For the latter, the remaining or unexplained variance of over 80 percent can produce a genuine sense of despair or serve to "re-mystify" the processes of teaching and learning. A compromise is suggested by interpretations that would see the unexplained variance as leaving generous room for both teaching and learning. The learning efforts made by adult learners may emerge as a determinant -- and there is always hope that the quality of instruction will.

To close on an optimistic note, this report should emphasize the interest that has been shown in this particular study. The presence of adult learners in the University System of Georgia is a matter of widespread interest and active concern. In many respects this interest is akin to that once shown the junior college transfer student. Will they attend? And can they do the work when they arrive? The answer to both questions is Yes! But with a proviso: like junior college transfers, adult learners may not appear in the numbers expected and there will be adjustments to make; and like the GI's of WWII, they may not always meet faculty expectations but they will be more interesting to teach.

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Table A-1  
Sex of Adult Learners in USGA Institutions

Gender	Frequency	Percent*
Female	1095	65.80
Male	569	34.19
Total	1664	100.00

Note: Percent may not add up to 100 due to rounding error.

Table A-2  
Age of Adult Learners in USGA Institutions

Age	Frequency	Percent*
Over 60	2	0.12
56 - 60	12	0.70
51 - 55	23	1.35
46 - 50	60	3.54
41 - 45	137	8.09
36 - 40	223	13.16
31 - 35	464	27.39
25 - 30	773	45.63
Total	1694	100.00

Note: Percent may not add up to 100 due to rounding error.

Table A-3

Race/Ethnic Group of Adult Learners  
in USGA Institutions

Race/Ethnic Group	Frequency	Percent*
Black	251	14.88
American Indian	2	0.12
Asian	15	0.89
Hispanic	17	1.01
White	1402	83.11
<b>Total</b>	<b>1687</b>	<b>100.00</b>

Note: Percent may not add up to 100 due to rounding error.

Table A-4

Year of High School Graduation  
for Adult Learners in USGA Institutions

Category	Frequency	Percent
1936 - 1945	7	0.59
1946 - 1950	18	1.51
1951 - 1955	36	3.02
1956 - 1960	120	10.06
1961 - 1965	204	17.10
1966 - 1970	356	29.84
1971 - 1975	391	32.77
1976 - 1980	61	5.11
<b>Total</b>	<b>1193</b>	<b>100.00</b>

Table A-5

Distribution of High School and College Grades  
for Adult Learners in USGA Institutions

Grade Averages	High School Average:		Grade-Point Averages:	
	Frequency	Percent*	Frequency	Percent*
36 - 40	109	9.28	239	14.70
31 - 35	155	13.19	242	14.88
26 - 30	303	25.79	368	22.63
21 - 25	301	25.62	254	15.62
16 - 20	234	19.92	273	16.79
11 - 15	65	5.53	83	5.11
6 - 10	7	0.60	58	3.57
0 - 5	1	0.08	109	6.70
<b>Total</b>	<b>1175</b>	<b>100.00</b>	<b>1626</b>	<b>100.00</b>

Note: Percent may not add up to 100 due to rounding error.

Table A-6

Distribution of College Grades  
for Adult Learners in USGA Institutions

GRADE-POINT AVERAGE	FALL 1979:		FALL 1980:	
	Frequency	Percent	Frequency	Percent
36 - 40	176	17.67	198	16.35
31 - 35	93	9.34	111	9.17
26 - 30	212	21.29	293	24.19
21 - 25	94	9.44	95	7.84
16 - 20	159	15.96	170	14.04
11 - 15	35	3.51	53	4.38
6 - 10	42	4.22	44	3.63
0 - 5	185	18.57	247	20.40
Total	996	100.00	1211	100.00

Table A-7

Distribution of Quarters Enrolled  
for Adult Learners in USGA Institutions

Quarters	Frequency	Percent
10	13	1.01
9	40	3.12
8	83	6.46
7	107	8.33
6	109	8.49
5	136	10.59
4	171	13.32
3	290	22.59
2	160	12.46
1	175	13.63
Total	1284	100.00

Note: Twenty-seven (2.06%) people had enrolled in 11 or more quarters.

Table A-8

Distribution of Hours Attempted and Hours Earned  
by Adult Learners in USGA Institutions

Category	Hours Attempted:		Hours Earned:	
	Frequency	Percent	Frequency	Percent*
211 - 240	1	0.06	3	0.18
181 - 210	2	0.12	7	0.42
151 - 180	13	0.77	11	0.65
121 - 150	29	1.72	40	2.38
91 - 120	87	5.17	97	5.77
61 - 90	229	13.60	224	13.33
31 - 60	448	26.60	414	24.64
16 - 30	294	17.46	281	16.73
0 - 15	581	34.50	603	35.89
<b>Total</b>	<b>1684</b>	<b>100.00</b>	<b>1680</b>	<b>100.00</b>

Note: Percent may not add up to 100 due to rounding error.

Table A-9

Distribution of Degree Objectives  
for Adult Learners in USGA Institutions

Category	Frequency	Percent
Associate	834	68.14
Bachelors	272	22.22
Applied Fields	118	9.64
Total	1224	100.00

Table A-10

Distribution of Enrollment Purposes  
for Adult Learners in USGA Institutions

Category	Frequency	Percent
Academic	587	56.33
Avocational	20	1.92
Personal	104	9.98
Career	331	31.77
Total	1042	100.00

Table B-1

Comparison of SAT-Verbal Scores  
for Male Students

Scores	Percent of:				
	National <sup>1</sup>	Regional <sup>2</sup>	State <sup>3</sup>	USGA <sup>4</sup>	Adult Learners
750-800	0	0	0	0	0
700-749	1	1	0	1	1
650-699	2	2	1	2	2
600-649	4	4	3	3	3
550-599	7	6	5	7	4
500-549	13	11	9	11	7
450-499	15	15	13	16	14
400-449	18	17	17	18	18
350-399	16	17	18	17	20
300-349	11	12	14	12	14
250-299	7	9	11	8	10
200-249	4	6	8	5	7
Mean	430	416	399	421	401
SD	110	111	108	105	108

1. The 1981 ATP National Norms.
2. The 1981 ATP Southern Region Norms.
3. The 1981 ATP Norms for the State of Georgia.
4. The 1981 University System of Georgia Norms.

Table B-2

Comparison of SAT-Verbal Scores  
for Female Students

Scores	Percent of:				
	National <sup>1</sup>	Regional <sup>2</sup>	State <sup>3</sup>	USGA <sup>4</sup>	Adult Learners
750-800	0	0	0	0	0
700-749	1	1	0	0	1
650-699	2	1	1	1	2
600-649	4	3	2	3	5
550-599	6	5	4	5	8
500-549	11	10	8	10	14
450-499	14	13	12	14	16
400-449	18	17	16	18	19
350-399	17	18	18	19	15
300-349	13	14	15	14	11
250-299	9	11	13	10	6
200-249	5	7	10	6	3
Mean	418	403	383	402	438
SD	110	110	106	102	104

1. The 1981 ATP National Norms.
2. The 1981 ATP Southern Region Norms.
3. The 1981 ATP Norms for the State of Georgia.
4. The 1981 University System of Georgia Norms.

Table B-3

Comparison of SAT-Verbal Scores  
for Total Samples

Scores	Percent of:				
	National <sup>1</sup>	Regional <sup>2</sup>	State <sup>3</sup>	USGA <sup>4</sup>	Adult Learners
750-800	0	0	0	0	0
700-749	1	1	0	0	1
650-699	2	2	1	1	2
600-649	4	3	2	3	4
550-599	7	6	5	6	7
500-549	12	11	9	10	11
450-499	15	14	12	15	15
400-449	18	17	17	18	18
350-399	17	17	18	18	17
300-349	12	13	15	13	13
250-299	8	10	12	9	7
200-249	5	7	9	5	4
Mean	424	409	390	411	424
SD	110	110	107	104	108

1. The 1981 ATP National Norms.
2. The 1981 ATP Southern Region Norms.
3. The 1981 ATP Norms for the State of Georgia.
4. The 1981 University System of Georgia Norms.

Table B-4

Comparison of SAT-Math Scores  
for Male Students

Scores	Percent of:				
	National <sup>1</sup>	Regional <sup>2</sup>	State <sup>3</sup>	USGA <sup>4</sup>	Adult Learners
750-800	1	1	1	1	0
700-749	3	2	1	3	0
650-699	6	5	4	5	1
600-649	10	8	6	8	2
550-599	14	12	10	10	6
500-549	16	15	14	14	9
450-499	15	15	15	15	12
400-449	13	14	15	15	17
350-399	10	12	13	10	23
300-349	8	10	12	10	20
250-299	4	6	8	5	9
200-249	1	1	2	1	2
Mean	492	469	450	471	402
SD	119	118	117	118	94

1. The 1981 ATP National Norms.
2. The 1981 ATP Southern Region Norms.
3. The 1981 ATP Norms for the State of Georgia.
4. The 1981 University System of Georgia Norms.

Table B-5

Comparison of SAT-Math Scores  
for Female Students

Scores	Percent of:				
	National <sup>1</sup>	Regional <sup>2</sup>	State <sup>3</sup>	USGA <sup>4</sup>	Adult Learners
750-800	0	0	0	0	0
700-749	1	1	0	1	0
650-699	3	2	1	1	0
600-649	5	4	3	3	1
550-599	10	8	6	6	2
500-549	14	12	10	10	6
450-499	15	15	13	14	10
400-449	17	17	17	17	18
350-399	14	16	17	20	28
300-349	12	14	17	17	24
250-299	7	10	12	9	9
200-249	1	2	3	2	1
Mean	443	425	407	471	383
SD	109	107	104	118	78

1. The 1981 ATP National Norms.
2. The 1981 ATP Southern Region Norms.
3. The 1981 ATP Norms for the State of Georgia.
4. The 1981 University System of Georgia Norms.

Table B-6

Comparison of SAT-Math Scores  
for Total Samples

Scores	Percent of:				
	National <sup>1</sup>	Regional <sup>2</sup>	State <sup>3</sup>	USGA <sup>4</sup>	Adult Learners
750-800	1	0	0	0	0
700-749	2	1	1	2	0
650-699	4	3	2	3	0
600-649	7	6	4	5	1
550-599	12	10	8	8	4
500-549	15	13	12	12	7
450-499	15	15	14	15	11
400-449	15	16	16	16	17
350-399	12	14	15	17	26
300-349	10	12	14	14	23
250-299	6	8	10	7	9
200-249	1	2	2	1	2
Mean	466	443	426	441	388
SD	117	114	112	111	84

1. The 1981 ATP National Norms.
2. The 1981 ATP Southern Region Norms.
3. The 1981 ATP Norms for the State of Georgia.
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Table C-1

Multiple Coefficients of Determination  
for Students in the University System of Georgia  
(1980 - 1981)

Sample	R-Squared For:			b-Weight	F-Ratio	p-Value
	(1)HSA + (2)SATV + (3)SATM					
Total (14,286)	.2304	.2927	.3187	(1) .5812 (2) .0015 (3) .0016	2904.99 406.89 545.07	.01 .01 .01
Males (7,251)	.2209	.2699	.3113	(1) .5526 (2) .0010 (3) .0019	1404.21 93.30 435.79	.01 .01 .01
Females (7,035)	.2704	.3609	.3978	(1) .6338 (2) .0018 (3) .0021	1805.12 333.64 431.07	.01 .01 .01

Table C-2

Standardized Regression Coefficients for  
Selected Institutions in the USGA (1980 - 1981)

Institution	HSA + SATV + SATM			R
U of Georgia	.3874	.1841	.1186	.58
Georgia State	.2789	.2447	.0916	.58
Georgia Tech.	.3805	.0356	.3101	.56
Albany State	.4834	.1614	.0633	.65
Fort Valley	.2761	.1450	.1239	.51
Savannah State	.2874	.1357	.1108	.51
Armstrong State	.3429	.2291	.0817	.61
Augusta College	.2795	.1356	.1774	.58
Columbus College	.2328	.1403	.1586	.52
Georgia Southwestern	.4166	.0569	.2226	.56
Georgia Southern	.4071	.1522	.1487	.61
Valdosta State	.2991	.1783	.1803	.62
West Georgia	.3511	.2103	.1590	.63
Abraham Baldwin	.4192	.1478	.1040	.58
Middle Georgia	.3728	.1076	.2213	.64
South Georgia	.3172	.1561	.0085	.56
North Georgia	.3805	.2097	.1416	.65
Georgia College	.4183	.1591	.2529	.70