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College accounting testing program bulletin no. 21; Results of the spring, 1954, college accounting testing program and supplementary studies

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THE AMERICAN INSTITUTE OF ACCOUNTANTS
COLLEGE ACCOUNTING TESTING PROGRAM

Bulletin No. 21

RESULTS OF THE
SPRING, 1954, COLLEGE ACCOUNTING TESTING PROGRAM
AND SUPPLEMENTARY STUDIES

Prepared by
Committee on Accounting Personnel
21 Audubon Avenue
New York 32, N. Y.

July, 1954

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COOPERATING INSTITUTIONS

Agricultural & Mechanical College of Texas
Agricultural & Technical College of North Carolina
University of Akron
University of Alabama
Alfred University

Anderson College
Arkansas State College
Assumption College
University of Baltimore
Bellarmino College

Bowling Green State University
Bridgewater College
Brigham Young University
Brooklyn College
Bryant College

Burdett College
Butler University
University of California, Los Angeles
Calvin College
Canisius College

Catawba College
Central Missouri State College
Chaffee College
University of Chicago
Chico State College

City College of San Francisco
Colorado College
Colorado State College of Education
University of Colorado
Dartmouth College

David Lipscomb College
University of Delaware
University of Denver
De Paul University
De Pauw University

University of Detroit
Dickinson College
Drake University
Drexel Institute of Technology
Duke University

Duquesne University
Elizabethtown College
Emmanuel Missionary College
Emory University
Fairfield University

Flint Junior College
University of Florida
Fordham University
Franklin & Marshall College
Gannon College

Goldey Beacom School of Business
Grand Rapids Junior College
Hanover College
Hastings College
Heidelberg College

Hillyer College
Hofstra College
College of the Holy Cross
Hope College
University of Houston

Idaho State College
University of Illinois
Iona College
State University of Iowa
Jackson Junior College

Jamestown College
Kent State University
Lamar State College of Technology
La Salle College
Lawrence College

Lebanon Valley College
Lehigh University
Lodi Evening Union High School
University of Louisville
Luther College

Lycoming College
Manhattan College
Marquette University
University of Maryland
University of Massachusetts

Merrimack College
 University of Miami
 Middletown Business College
 Millsaps College
 Mississippi State College

University of Mississippi
 Mitchell College
 Morse College
 National Business College
 University of Nevada

New Haven College
 University of New Mexico
 Niagara University
 University of North Carolina
 North Texas State College

Northwestern Junior College
 Oberlin College
 University of Omaha
 University of Oregon
 Pacific Union College

Parsons College
 Pennsylvania Military College
 Pennsylvania State University
 University of Pennsylvania
 University of Pittsburgh

Providence College
 Queens College
 Regis College (Colorado)
 Regis College (Massachusetts)
 University of Rhode Island

Rider College
 Robinson Business College
 Rochester Institute of Technology
 University of Rochester
 Rockhurst College

Roosevelt College of Chicago
 Rutgers University, School of Bus. Adm.
 St. Ambrose College
 St. Francis College
 St. John Fisher College

St. Joseph's College (Indiana)
 St. Joseph's College (Pennsylvania)
 St. Mary's University
 St. Michael's College
 St. Norbert College

St. Vincent College
 San Diego State College
 University of San Francisco
 University of Santa Clara
 University of Scranton

Siena College
 Simpson College
 Sinclair College
 University of South Carolina
 University of South Dakota

South Middlesex Secretarial School
 Southern Illinois University
 Southwestern Louisiana Institute
 Spencerian College
 Spring Hill College

Stevens Business College
 Strayer College of Accountancy
 Susquehanna University
 Temple University
 University of Texas

Ventura College
 Villanova University
 Virginia Polytechnic Institute
 University of Virginia
 Wake Forest College

Walla Walla College
 Walsh Institute of Accountancy
 Washington & Lee University
 Wayne University
 West Texas State College

Westchester Commercial School
 Western Michigan College
 Westminster College
 Wheaton College
 College of William and Mary

University of Wisconsin
 University of Wyoming

INTRODUCTION

The eighth spring College Accounting Testing Program held in April and May, 1954, included 162 participating institutions as compared with 158 in the spring of 1953, 185 in the spring of 1952, and 173 in the spring of 1951. The numbers of tests used this spring are compared with the numbers in the three preceding programs in the following tabulation:

<u>Test</u>	<u>Spring 1954</u>	<u>Spring 1953</u>	<u>Spring 1952</u>	<u>Spring 1951</u>
Orientation Test	2,050	2,169	2,251	4,734
Achievement Test, Level I	4,925	5,580	5,713	6,916
Achievement Test, Level II	1,990	2,034	1,940	3,502
Strong Vocational Interest Blank	568	397	516	1,113
Total	9,533	10,180	10,420	16,265

It will be observed that the number of colleges participating in the program this spring was slightly larger than the number in last spring's program but that there was a small decrease in the number of tests used.

When the colleges participating this spring were analyzed according to type of institution, it was found that fifty-two, or 32.1 per cent, were schools of business in colleges and universities; seventy-five, or 46.3 per cent, were liberal arts colleges, most of which had a department of business administration; four, or 2.5 per cent, were teachers' colleges; eight, or 4.9 per cent, were technical colleges; eleven, or 6.8 per cent, were junior colleges; and twelve, or 7.4 per cent, were private business colleges. More than three-fourths of the total number of institutions in this program were accounted for by universities and liberal arts colleges.

As was true last spring, colleges in all regions of the country took part in the 1954 spring testing program. The numbers of participating colleges from the different regions are as follows: New England, fifteen; Middle Atlantic States, forty-two; North Central Region, forty-six; South, thirty-five; and West, twenty-three. Colleges in forty-one states, the District of Columbia, and Canada participated in this program. Pennsylvania led with twenty-two colleges, and New York was second with fourteen, followed by California and Michigan with ten participating colleges in each of these states.

SUMMARY OF TEST RESULTS

The results of the accounting Orientation and Achievement Tests taken in the colleges during the spring, 1954, program are shown in Tables I through X. These distributions are based on the forms of the tests recommended for this program. There was occasional use of other forms of the tests in certain colleges, but these results are not shown. Also eliminated from the statistical tables are results for very small numbers of students at certain levels.

The results of the Strong Vocational Interest Blank which was used in certain colleges in connection with the spring program are not shown in this bulletin. Distributions of scores on the various scales of this blank would not be very meaningful, since the more important aspect of the results is the profile of interest scores obtained for each individual student.

For some years the norms in the College Accounting Testing Program have been based on the scores of students tested either on a required basis or in classes where 90 per cent or more of the students voluntarily took part. This is the larger and more important group of participating students, but for purposes of comparisons the distributions of scores obtained in classes where less than 90 per cent of the students voluntarily took the tests are also shown.

Achievement Test, Level I.- Tables I and II are concerned with the distributions of scores on Achievement Test, Level I, Form A. Table I shows the distributions for students and class groups at the first-, second-, and third-year levels of study where the test was required or where 90 per cent or more of the students took it voluntarily. Table II gives the distributions for students in classes where less than 90 per cent voluntarily participated.

By reference to Table I it will be noted that the median scores made by first- and second-year students on Achievement Test, Level I, Form A, this spring are very close to the medians obtained in the spring of 1952, while the median for the third year of study is a little below the 1952 median. Although the range of scores in both the first- and second-year groups covers the greater part of the possible range, the median obtained by the second-year students is well above the median for the first-year group. On the other hand, the median for the comparatively small group of third-year students does not go on upward but falls below the median made by the second-year group.

The Achievement Test median for the first-year accounting group taking the test voluntarily, as shown in Table II, is a little above the median for the norm group obtained in the spring of 1952 and approximately four raw score points above the median for the "required" group at the first-year level this spring. In the second year of study, however, the median for the voluntary group is almost identical with the median for the 1952 norm group and with the median made by the second-year students who took the test on a required basis this spring. The impression of wide differences in the achievement of individuals in accounting courses studying at the same level is maintained throughout Tables I and II.

Achievement Test, Level II.- The distributions of scores for both "required" and "voluntary" groups of seniors who took Achievement Test,

Level II, Forms B and D, are shown in Table III. As in the preceding tables, the median scores of individual colleges, as well as scores of individual students, are shown. Much the largest group took Form D either as a requirement or on a voluntary basis with participation of 90 per cent or more of the students in the class.

The medians for the required groups are slightly above the medians based on earlier testing programs in the results for both forms of this test. The median on Form B for the small voluntary group having less than 90 per cent of the students participating is somewhat low. On Form D the students who took part in voluntary testing with less than 90 per cent of the students in their classes involved have a median score several points above the median resulting from testing in earlier years and also noticeably above the median for the required group.

The scores of the individual students on both forms of the Level II test are widely spread, and even the median scores of the colleges using Form D cover a large range.

Achievement Test, Level II, Form D, was used by a few colleges in the second and third year of study even though the spring announcement recommended Level I for use in all classes below the senior year. The results for a combined second- and third-year required group and for a combined second- and third-year voluntary group are shown in Table IV. The medians are considerably below the combined median based on testing in earlier years.

Orientation Test.- Distributions of the verbal, quantitative, and total scores on the Orientation Test, Form A, are shown in Tables V to X inclusive. Tables V through VIII display the results for students in the first, second, third, and senior years of college in classes where the Orientation Test was required or where 90 per cent or more took it voluntarily.

The verbal, quantitative, and total score medians derived from the distributions for the first-, second-, and third-year students are in all cases a little below the corresponding medians from earlier years. The differences between this year's medians and the earlier ones are slight in the quantitative part of the test but somewhat larger on the verbal part. There are fairly substantial increases in median score from the first to the second year and from the second to the third year of study in all three types of score.

Distributions for a group of 381 first-year accounting students tested on a voluntary basis in nine colleges and for a small group of forty-seven second-year students tested in two colleges are shown in Tables IX and X. Fairly high medians were obtained by the voluntary group at the first-year level, while the other group is too small to warrant generalizations concerning the results.

Although there are some specific exceptions to this statement, in the overall picture the mental ability and accounting achievement of the students taking part in the 1954 spring testing program appear to be rather closely similar to those of students participating in preceding spring programs. As in earlier years, there was some evidence that volunteers in the testing program tended to do a little better than those required to take the tests. These differences, while not striking, would seem to lend support to the practice of basing the accounting test norms on the scores of students in classes where the tests are required or where at least nine-tenths of the students take the tests when they are allowed to decide for themselves whether or not they will participate.

TABLE I

DISTRIBUTIONS OF SCORES OF INDIVIDUAL STUDENTS AND MEDIAN SCORES OF INDIVIDUAL COLLEGES ON ACHIEVEMENT TEST, LEVEL I, FORM A, IN CLASSES WHERE THE TEST WAS REQUIRED OR WHERE 90 PER CENT OF THE STUDENTS, OR MORE, TOOK IT ON A VOLUNTARY BASIS

Score	FIRST YEAR		SECOND YEAR		THIRD YEAR	
	Scores of Individual Students	Median Scores of Individual Colleges	Scores of Individual Students	Median Scores of Individual Colleges	Scores of Individual Students	Median Scores of Individual Colleges
120						
117						
114						
111	3		3			
108	4		5			
105	3		4			
102	10		9		1	
99	16		16		3	
96	12		5		4	
93	26		16		4	
90	35		20		9	1
87	41		30		4	
84	51		23	2	1	
81	61		31	2	4	
78	84		29	1	10	
75	106	2	31	2	9	1
72	116	3	32	1	2	
69	142	2	35	3	10	1
66	165	4	32	3	6	
63	185	8	28	2	11	1
60	185	6	37	4	7	2
57	212	8	39	2	10	2
54	216	10	31	1	9	1
51	218	8	25	2	5	
48	212	5	26		7	
45	200	8	12		7	
42	197	4	27		4	
39	204	3	12		6	
36	158	5	10		2	
33	167	1	10		4	
30	137	2	5		1	
27	142	2	9			
24	104	1	5			
21	68		2		1	
18	69		1			
15	48	1	2			
12	35				1	
9	32		1			
6	14					
3	16		1			
0-2	17					
Total	3711	83	604	25	142	9
Q3	65.1	62.1	82.1	76.1	79.4	
Md	51.5	54.5	67.8	67.5	64.9	62.3
Q1	37.5	42.7	54.3	60.9	52.5	
Range	0-113	15.0-75.0	4-112	52.5-85.5	14-104	54.8-91.5
10 %ile	26.1	36.8	42.3	55.5	41.6	
90 %ile	77.3	68.0	92.6	83.3	92.3	

----Medians, spring program, 1952

TABLE II

DISTRIBUTIONS OF SCORES OF INDIVIDUAL STUDENTS AND MEDIAN SCORES OF INDIVIDUAL COLLEGES ON ACHIEVEMENT TEST, LEVEL I, FORM A, IN CLASSES WHERE LESS THAN 90 PER CENT OF STUDENTS VOLUNTARILY TOOK THE TEST

Score	FIRST YEAR		SECOND YEAR		THIRD YEAR	
	Scores of Individual Students	Median Scores of Individual Colleges	Scores of Individual Students	Median Scores of Individual Colleges	Scores of Individual Students	Median Scores of Individual Colleges
120						
117						
114						
111						
108			1			
105			1			
102			1			
99	1		9			
96	3		6		1	
93	1		4		2	
90	4		5		1	
87	5		1		2	
84	3		2		1	
81	2		13			
78	4		9	1	1	
75	8		7	2	1	
72	13	1	8	2		
69	12	1	12		1	
66	6		11	1	1	
63	20	1	15	3		
60	22	1	9	1	1	
57	14	4	9			
54	23	2	4		3	1
51	18	2	7			
48	19		9		1	
45	14	1	4			
42	12		3			
39	8		5			
36	7		2			
33	5		1			
30	7		1	1		
27	5		3			
24	4					
21	7	1	2			
18	2		2			
15	2					
12	1					
9	1					
6						
3						
0-2	1					
Total	254	14	166	11	16	1
Q3	65.8		81.3		90.0	
Md	55.8	57.8	67.9	67.5	78.0	
Q1	45.3		55.9		58.5	
Range	0-101	21.5-72.8	20-109	31.5-79.5	48-98	56.3
10 %ile	31.0		42.6		54.6	
90 %ile	77.1		96.7		95.1	

---Medians, spring program, 1952

DISTRIBUTIONS OF SCORES OF SENIOR ACCOUNTING STUDENTS AND MEDIAN SCORES
OF SENIOR CLASSES ON ACHIEVEMENT TEST, LEVEL II, FORMS B AND D

Score	FORM B				Score	FORM D			
	Required*		Voluntary ^x			Required*		Voluntary ^x	
	Scores of Indiv. Students	Median Scores of Indiv. Colleges	Scores of Indiv. Students	Median Scores of Indiv. Colleges		Scores of Indiv. Students	Median Scores of Indiv. Colleges	Scores of Indiv. Students	Median Scores of Indiv. Colleges
150					100				
147					98			1	
144					96	4		2	
141					94	7		3	
138					92	6		2	
135					90	16		5	
132					88	13		1	
129	3				86	18		6	
126	1				84	37		11	
123	5				82	17		6	
120	5				80	36		6	
117	5		2		78	43	1	11	2
114	6				76	21	1	7	
111	7				74	37	3	14	1
108	9		1		72	58		16	2
105	16		1		70	30	2	13	3
102	13		2		68	42	2	1	
99	9	2	2		66	56	2	11	
96	16	1			64	36	6	6	2
93	16		1		62	34	4	10	1
90	20	3	1		60	40	3	9	
87	13	1	1		58	27	2	8	
84	18	2	1		56	39	4	6	I
81	13	2			54	48	2	7	
78	17	2	5	I	52	42	4	2	
75	17	2			50	33	1	5	
72	14	1	4	1	48	29	2	7	1
69	16	2	2		46	27	1	7	
66	14		3		44	32		4	
63	12		1		42	32	1	5	
60	6		1		40	26	1	5	
57	11		1		38	25	5		
54	7		1		36	25	2	4	
51	2		1		34	17		3	
48	6				32	26	1	1	
45	3		1		30	24		4	
42	1		3		28	17	1	3	
39	3			1	26	10		4	
36			1		24	23		2	1
33	2				22	7		2	
30	1		1		20	10		2	
27					18	12		1	
24	1		2		16	11		1	
21	2				14	7		1	
18	1		1		12	10		2	
15	1		1		10	8		1	
12					8	8			
9					6	8			
6					4	2			
3					2				
0-2					0-1	3			
Total	312	18	41	3	Total	1139	51	228	14
Q3	99.3	91.5	89.3		Q3	73.0	65.4	77.1	
Md	85.0	84.0	72.4		Md	58.6	58.5	66.4	70.7
Q1	69.9	77.3	51.8		Q1	42.4	48.8	49.4	
Range	17-131	70.0-99.0	17-119	40.5-79.5	Range	0-96	29.0-79.0	11-99	25.0-79.0
10 %ile	57.3	71.7	30.3		10 %ile	27.0	38.4	31.9	
90 %ile	111.3	99.3	104.9		90 %ile	82.5	71.9	85.5	

----Median, combined spring programs, 1949,
1950, 1952

----Median, combined spring programs, 1952,
1953

*Colleges testing on required basis plus classes in which 90 per cent or more of the students voluntarily took the test
xColleges having classes in which less than 90 per cent of the students took the test

DISTRIBUTIONS OF SCORES OF COMBINED SECOND AND THIRD YEAR ACCOUNTING STUDENTS AND MEDIAN SCORES OF COMBINED SECOND AND THIRD YEAR CLASSES ON ACHIEVEMENT TEST, LEVEL II, FORM D

Score	REQUIRED*		VOLUNTARY*	
	Scores of Individual Students	Median Scores of Individual Colleges	Scores of Individual Students	Median Scores of Individual Colleges
100				
98				
96			1	
94				
92				
90				
88				
86			1	
84	2		1	
82	1		1	
80	2		1	
78	3		3	
76	2		1	
74	4		1	
72	1		1	1
70	2	1		
68	2			
66	3		2	
64	2		1	
62	3		2	
60	2		4	
58	5		1	
56	1	1		
54	5	1	2	1
52	5	1	1	
50	3		4	1
48	4	1	1	
46	5		1	
44	6	1	2	
42	7	2	2	
40			2	
38	7			
36	11		1	
34	5	1	3	
32	7		5	
30	9		5	
28	6	1	4	1
26	4		2	
24	4		1	
22	5	1	5	
20	3		3	
18	5		1	
16	7		2	
14	2			
12	2		3	
10	1		2	
8	1		1	
6	1			
4			2	
2			1	
0-1				
Total	150	11	77	4
Q3	55.0		60.4	
Md	38.6	45.0	35.0	
Q1	28.8		23.7	
Range	6-85	23.0-71.0	2-96	28.5-72.0
10 %ile	18.4		13.1	
90 %ile	72.0		78.2	

----Median, combined spring programs, 1950 and 1953

*Colleges testing on a required basis plus classes in which 90 per cent or more of the students voluntarily took the test

xColleges having classes in which less than 90 per cent of the students voluntarily took the test

DISTRIBUTIONS OF SCORES OF FIRST YEAR ACCOUNTING STUDENTS AND
 MEDIAN SCORES OF FIRST YEAR CLASSES ON ORIENTATION TEST, FORM A,
 IN CLASSES WHERE THE TEST WAS REQUIRED OR WHERE 90 PER CENT
 OR MORE TOOK IT ON A VOLUNTARY BASIS

VERBAL			QUANTITATIVE			TOTAL		
Score	Scores of Indiv. Students	Median Scores of Indiv. Colleges	Score	Scores of Indiv. Students	Median Scores of Indiv. Colleges	Score	Scores of Indiv. Students	Median Scores of Indiv. Colleges
99-100								
96						160		
93						155		
90			60	1		150		
87	1		58			145		
84	1		56	2		140	1	
81	3		54	2		135	1	
78	1		52	2		130	2	
75	6		50	4		125	4	
72	3		48	8		120	1	
69	9		46	5		115	3	
66	11		44	12		110	6	
63	15		42	20		105	6	
60	14		40	12		100	9	
57	16		38	15		95	21	
54	20		36	34		90	21	
51	29		34	34	1	85	20	
48	31		32	46	1	80	47	
45	33	1	30	53	2	75	50	
42	51	1	28	63	1	70	61	3
39	44	4	26	51	4	65	66	4
36	68	3	24	53	3	60	74	3
33	71	2	22	70	3	55	67	4
30	76	3	20	38	1	50	74	2
27	66	1	18	44		45	64	
24	56	1	16	52		40	62	
21	57		14	36		35	44	
18	45		12	32		30	36	
15	27		10	31		25	16	
12	17		8	26		20	12	
9	1		6	14		15	8	
6	4		4	3		10		
3			2	5		5		
0-2			0-1	8		0-4		
Total	776	16	Total	776	16	Total	776	16
Q3	44.9	40.5	Q3	32.1	30.0	Q3	74.8	68.8
Md	34.6	37.0	Md	25.1	26.5	Md	60.3	63.3
Q1	26.3	32.0	Q1	17.5	24.0	Q1	46.3	57.5
Range	7-88	25.5- 45.0	Range	0-60	21.4- 34.5	Range	15-141	50.8- 72.5
10 %ile	19.9	28.8	10 %ile	11.4	22.4	10 %ile	35.6	54.0
90 %ile	57.5	43.2	90 %ile	38.7	32.8	90 %ile	89.4	72.3

----Medians, combined spring programs, 1952 and 1953

DISTRIBUTIONS OF SCORES OF SECOND YEAR ACCOUNTING STUDENTS AND
 MEDIAN SCORES OF SECOND YEAR CLASSES ON ORIENTATION TEST, FORM A,
 IN CLASSES WHERE THE TEST WAS REQUIRED OR WHERE 90 PER CENT
 OR MORE TOOK IT ON A VOLUNTARY BASIS

Score	VERBAL		Score	QUANTITATIVE		Score	TOTAL	
	Scores of Individ. Students	Median Scores of Individ. Colleges		Scores of Individ. Students	Median Scores of Individ. Colleges		Scores of Individ. Students	Median Scores of Individ. Colleges
99-100								
96						160		
93						155		
90			60			150		
87	1		58			145		
84			56			140	1	
81			54			135		
78			52	3		130		
75			50	1		125		
72	2		48			120	1	
69	1		46	5		115	1	
66	2		44	7		110		
63	5		42	1		105	2	
60			40	2		100	4	
57	4		38	7		95	2	
54	4		36	5		90	8	
51	5		34	8	1	85	5	
48	5		32	8		80	10	
45	5		30	12	1	75	8	
42	12	1	28	12	2	70	14	2
39	15	2	26	11		65	13	1
36	9		24	5		60	14	
33	13		22	7		55	12	1
30	10	1	20	6		50	7	
27	5		18	5		45	5	
24	9		16	2		40	6	
21	6		14			5	1	
18	3		12	2		30	2	
15			10	5		25		
12			8	2		20		
9			6			15		
6			4			10		
3			2			5		
0-2			0-1			0-4		
Total	116	4	Total	116	4	Total	116	4
Q3	48.0		Q3	36.8		Q3	82.5	
Md	39.6		Md	30.2		Md	69.2	
Q1	31.8		Q1	24.0		Q1	58.3	
Range	18-88	31.1-42.0	Range	9-53	28.3-35.5	Range	30-140	58.8-73.8
10 %ile	24.9		10 %ile	18.2		10 %ile	47.6	
90 %ile	59.6		90 %ile	45.3		90 %ile	94.6	

----Medians, combined spring programs, 1952 and 1953

TABLE VII

DISTRIBUTIONS OF SCORES OF THIRD YEAR ACCOUNTING STUDENTS AND
 MEDIAN SCORES OF THIRD YEAR CLASSES ON ORIENTATION TEST, FORM A,
 IN CLASSES WHERE THE TEST WAS REQUIRED OR WHERE 90 PER CENT
 OR MORE TOOK IT ON A VOLUNTARY BASIS

Score	VERBAL		Score	QUANTITATIVE		Score	TOTAL	
	Scores of Indiv. Students	Median Scores of Indiv. Colleges		Scores of Indiv. Students	Median Scores of Indiv. Colleges		Scores of Indiv. Students	Median Scores of Indiv. Colleges
99-100								
96						160		
93						155		
90			60			150		
87			58			145		
84	1		56			140		
81	1		54			135		
78	1		52			130		
75			50			125	2	
72	1		48			120	1	
69	1		46	3		115	1	
66			44	2		110	1	
63	1		42			105	1	
60	2		40	4	1	100		
57	2		38	3		95	1	
54			36	3		90	1	
51	2		34			85	5	
48	1		32	1		80	3	1
45	2		30	4	1	75	4	1
42	1	1	28	3		70		
39	5	1	26	4		65	4	
36	2		24			60	3	
33	3		22			55	1	
30	4		20	1		50	2	
27	1		18	2		45	1	
24	2		16	1		40		
21			14			35	2	
18			12			30		
15			10	1		25		
12			8	1		20		
9			6			15		
6			4			10		
3			2			5		
0-2			0-1			0-4		
Total	33	2	Total	33	2	Total	33	2
Q3	59.6		Q3	40.4		Q3	89.8	
Md	41.7		Md	31.8		Md	79.4	
Q1	34.3		Q1	27.1		Q1	63.8	
Range	25-86	41.3- 43.5	Range	9-47	30.0- 40-5	Range	35-129	76.7- 82.5
10 %ile	30.2		10 %ile	18.3		10 %ile	50.8	
90 %ile	74.1		90 %ile	45.7		90 %ile	118.5	

----Medians, combined spring programs, 1952 and 1953

DISTRIBUTIONS OF SCORES OF SENIOR ACCOUNTING STUDENTS AND
 MEDIAN SCORES OF SENIOR CLASSES ON ORIENTATION TEST, FORM A,
 IN CLASSES WHERE THE TEST WAS REQUIRED OR WHERE 90 PER
 CENT OR MORE TOOK IT ON A VOLUNTARY BASIS

Score	VERBAL		Score	QUANTITATIVE		Score	TOTAL	
	Scores of Indiv. Students	Median Scores of Indiv. Colleges		Scores of Indiv. Students	Median Scores of Indiv. Colleges		Scores of Indiv. Students	Median Scores of Indiv. Colleges
99-100								
96						160		
93						155		
90			60			150		
87	1		58	2		145		
84	1		56	2		140	1	
81	3		54	2		135	1	
78			52	3		130	2	
75	4		50	8		125	2	
72	4		48	2		120	4	
69	6		46	11	1	115	7	
66	15	1	44	6		110	9	
63	1		42	7		105	8	1
60	6		40	6	1	100	12	2
57	9	2	38	9	2	95	6	
54	8	1	36	7	1	90	11	1
51	5	1	34	8		85	7	1
48	6	1	32	7		80	6	
45	10		30	6	1	75	6	1
42	2	1	28	3	1	70	5	1
39	4		26	4		65	5	
36	9		24	1		60	6	
33	4		22	1		55	1	
30	2		20	2		50	1	
27	1		18	2		45	2	
24	1		16	1		40	1	
21	1		14	1		35		
18			12			30		
15			10			25		
12			8			20		
9			6	2		15		
6			4			10		
3			2			5		
0-2			0-1			0-4		
Total	103	7	Total	103	7	Total	103	7
Q3	67.7		Q3	46.8		Q3	110.1	
Md	56.4	55.5	Md	39.4	38.5	Md	95.4	92.5
Q1	45.5		Q1	32.8		Q1	79.0	
Range	23-87	43.5- 66.3	Range	7-58	29.0- 47.0	Range	42-142	72.5- 107.5
10 %ile	36.4		10 %ile	26.2		10 %ile	64.4	
90 %ile	74.0		90 %ile	51.7		90 %ile	119.8	

----Medians, combined spring programs, 1952 and 1953

DISTRIBUTIONS OF SCORES OF FIRST YEAR ACCOUNTING STUDENTS AND MEDIAN SCORES
OF FIRST YEAR CLASSES ON ORIENTATION TEST, FORM A, IN CLASSES WHERE LESS
THAN 90 PER CENT OF THE STUDENTS VOLUNTARILY TOOK THE TEST

Score	VERBAL		Score	QUANTITATIVE		Score	TOTAL	
	Scores of Indiv. Students	Median Scores of Indiv. Colleges		Scores of Indiv. Students	Median Scores of Indiv. Colleges		Scores of Indiv. Students	Median Scores of Indiv. Colleges
99-100								
96						160		
93						155		
90	1		60	1		150		
87	1		58	1		145	2	
84			56			140		
81	3		54	2		135	2	
78	2		52	2		130		
75	5		50	5		125		
72	3		48	7		120	2	
69	6		46	6		115	4	
66	10		44	9		110	5	
63	5		42	10		105	9	
60	9	1	40	18		100	10	
57	14		38	20		95	20	1
54	10		36	16	1	90	15	
51	25	1	34	24	1	85	25	
48	28		32	36	2	80	22	1
45	29	1	30	22	1	75	37	2
42	27	1	28	26	1	70	33	
39	28	1	26	36	1	65	36	2
36	31	1	24	22		60	35	1
33	25		22	25	1	55	28	1
30	28	2	20	24		50	32	
27	26	1	18	18	1	45	21	1
24	20		16	15		40	15	
21	14		14	9		35	13	
18	13		12	9		30	9	
15	11		10	7		25	3	
12	5		8	5		20	2	
9	1		6	3		15		
6	1		4	3		10	1	
3			2			5		
0-2			0-1			0-4		
Total	381	9	Total	381	9	Total	381	9
Q3	50.9		Q3	36.2		Q3	84.7	
Md	40.7	40.5	Md	29.1	31.0	Md	69.4	68.8
Q1	30.5		Q1	22.2		Q1	54.9	
Range	7-91	27.8- 60.0	Range	4-60	19.0- 37.0	Range	12-147	46.9- 95.0
10 %ile	22.5		10 %ile	16.3		10 %ile	43.4	
90 %ile	62.3		90 %ile	43.0		90 %ile	99.0	

----Medians, combined spring programs, 1952 and 1953

TABLE X

DISTRIBUTIONS OF SCORES OF SECOND YEAR ACCOUNTING STUDENTS AND MEDIAN SCORES OF SECOND YEAR CLASSES ON ORIENTATION TEST, FORM A, IN CLASSES WHERE LESS THAN 90 PER CENT OF THE STUDENTS VOLUNTARILY TOOK THE TEST

Score	VERBAL		Score	QUANTITATIVE		Score	TOTAL	
	Scores of Individ. Students	Median Scores of Individ. Colleges		Scores of Individ. Students	Median Scores of Individ. Colleges		Scores of Individ. Students	Median Scores of Individ. Colleges
99-100								
96						160		
93						155		
90			60			150		
87			58			145		
84			56			140		
81			54			135		
78	1		52			130		
75			50	1		125		
72			48	1		120	1	
69	1		46	1		115		
66			44	2		110		
63	1		42	3		105	1	
60	2		40	1		100		
57	1		38	3		95	4	
54	1		36	4		90	3	
51	3		34	3	1	85	1	
48	3		32	2		80	4	
45	2		30	5		75	3	
42	2	1	28	1		70	7	2
39	4		26	3		65	2	
36	3	1	24	3	1	60	2	
33	2		22	1		55	5	
30	6		20	3		50	4	
27	5		18	2		45	1	
24	1		16			40	2	
21	5		14	2		35	3	
18	2		12	1		30	1	
15	1		10	1		25	2	
12	1		8	2		20		
9			6			15	1	
6			4	2		10		
3			2			5		
0-2			0-1			0-4		
Total	47	2	Total	47	2	Total	47	2
Q3	49.3		Q3	38.2		Q3	82.8	
Md	36.5		Md	31.0		Md	70.4	
Q1	28.1		Q1	21.2		Q1	52.2	
Range	13-79	36.0-43.5	Range	5-51	24.0-35.0	Range	18-121	72.0-72.5
10 %ile	21.4		10 %ile	11.4		10 %ile	36.2	
90 %ile	60.5		90 %ile	44.3		90 %ile	96.6	

----Medians, combined spring programs, 1952 and 1953

CORRELATIONS BETWEEN OBJECTIVE TESTS IN ACCOUNTING
AND CPA EXAMINATIONS: A SECOND REPORT

by Robert L. Kane, Jr. and Robert Jacobs

Introduction

A preliminary study of the relationships between grades on the uniform CPA Examinations and scores on the tests used in the College Accounting Testing Program was reported by Kane and Traxler¹ in the spring of 1951. The data used for that study were based on the CPA Examinations administered in the spring of 1950. The number of individuals taking the CPA Examinations at that time who could be identified as having taken any of the tests employed in the college program was rather small. The confidential nature of the examinations presents various problems in identification of individuals and restricts the scope of studies, since cooperation must be obtained to get the necessary data. The correlations reported in the initial paper, based on a rather small group, were found to be generally favorable, although not high enough to predict CPA Examination grades from scores on the objective tests alone. The need for a follow-up study with a larger population was indicated.

By the spring of 1951 a larger number of examinees for the CPA certificate could be identified as having taken one or more of the college tests. During the past two years data have been gathered from the project office test files for the 1951 group. These data have been combined with those of the 1950 study to form the basis of a more comprehensive report. This article presents the results of this follow-up study.

Only two of the tests employed in the College Accounting Testing Program were used in studying the relationships between objective test scores and CPA Examination grades. These are the Orientation Test and the Level II Achievement Test. The Orientation Test is a test of general aptitude with vocabulary, reading materials, and arithmetic problems drawn from the subject matter of business. It yields a verbal score, a quantitative score, and a total score. There are three separate forms of the Orientation Test with norms for each level of study and for employed accountants.

The Level II Achievement Test measures knowledge of accounting principles and procedures after completion of a college major in accounting or its equivalent in practical experience. There are two four-hour forms of this test and two two-hour forms. In the four-hour forms there are sections on auditing, but the two-hour forms do not have auditing items. This test yields only a total score. For the Level II test there are college senior norms and norms for employed accountants.

Both of these tests are of the short answer or objective type. Project office scoring is required when these tests are given in schools and colleges of business, and an extensive file of test scores has been accumulated at the central office.

¹Robert L. Kane, Jr. and Arthur E. Traxler, "Correlations between Objective Tests in Accounting and CPA Examinations--A First Report," Report of the Spring, 1951, College Accounting Testing Program, pp. 27-33. The American Institute of Accountants College Accounting Testing Program. Bulletin No. 12. New York: Committee on Selection of Personnel, July, 1951.

The CPA Examinations are made up of separate tests in auditing, theory, accounting problems, and law. The questions are principally of the essay and problem solving type. In order to qualify for the CPA certificate the candidate must pass all four of the separate tests though they need not be passed simultaneously. They are graded on a percentage basis with 75 as the passing mark. Although an earnest attempt is made to keep the CPA Examinations fairly comparable from year to year, entirely new examinations are prepared for each testing.

One would conclude immediately that there are rather marked differences between the two kinds of tests which would have some effect on the size of the correlations. It should be stated, too, that other factors tend to interfere with a close relationship between the results of the two kinds of tests. These were pointed out in the initial report by Kane and Traxler and may be summarized as follows:

1. In some states CPA examinees are allowed to pass and receive credit on some parts of the test while failing other parts. Consequently, many candidates prepare thoroughly for two of the examination sections with no serious effort to pass the other parts, knowing that the failed sections may be taken again after concentrated preparation. This factor does not operate with regard to motivation and effort in the college program tests.
2. At the time of taking the college program tests, individuals do not differ a great deal with respect to kind and amount of training and experience. At the time of sitting for the CPA Examinations, however, a variety of experience with respect to both amount and kind will be found in the group being examined, since the CPA Examination is usually not taken until one or two years after graduation from college.
3. Considerable pressure operates to motivate best effort on the CPA Examination sections which the individual intends to pass, for his advancement in the profession is dependent in some degree upon the outcome of the test. In taking the objective tests in college there may be no great pressures to encourage best effort. The examinee may or may not be in agreement with the testing, or he may fail to see any relationship between the test and his station in the profession. In the latter situation good motivation comes about mostly from wise test administration.

All of these factors tend to introduce variables which will affect in some degree the correlations which may be obtained between the scores and grades. These limiting factors should be kept in mind as the results described in the following pages are studied.

Orientation Test Data

Correlations between grades on the four parts of the CPA Examinations and scores on the Orientation Test taken during the first year of accounting study, based on the combined 1950 and 1951 groups, are shown in Table XI. In order to make comparisons with the results of the first study the corresponding data from the earlier report for Orientation Test, Form A,² are shown in the columns at the right in Table XI.

²This is the only form of the Orientation Test for which first-year data were reported in the initial study.

TABLE XI

CORRELATIONS OF RAW SCORES ON ORIENTATION TESTS TAKEN
BY FIRST YEAR ACCOUNTING STUDENTS IN COLLEGE
WITH GRADES ON CPA EXAMINATIONS TAKEN SOME YEARS LATER

Test	CPA Examination	Accumulated Data May, 1951			Data From Previous Study		
		N	<u>r</u>	P.E.	N	<u>r</u>	P.E.
Orientation A							
Verbal vs. Auditing		79	.28 ±	.070	19	.34 ±	.137
Verbal vs. Theory		70	.22 ±	.077	16	.64 ±	.100
Verbal vs. Problems		70	.23 ±	.077	21	-.03 ±	.147
Verbal vs. Law		68	.16 ±	.080	13	-.19 ±	.181
Verbal vs. Av. First 3		51	.34 ±	.083	12	.29 ±	.179
Verbal vs. Av. All 4		51	.29 ±	.087	12	.14 ±	.191
Quant. vs. Auditing		79	.40 ±	.064	19	.47 ±	.121
Quant. vs. Theory		70	.33 ±	.072	16	.38 ±	.144
Quant. vs. Problems		70	.52 ±	.059	21	.34 ±	.130
Quant. vs. Law		68	.33 ±	.073	13	-.33 ±	.166
Quant. vs. Av. First 3		51	.42 ±	.078	12	.24 ±	.184
Quant. vs. Av. All 4		51	.41 ±	.079	12	-.06 ±	.194
Total vs. Auditing		79	.39 ±	.064	19	.46 ±	.122
Total vs. Theory		70	.30 ±	.073	16	.62 ±	.104
Total vs. Problems		70	.38 ±	.069	21	.08 ±	.147
Total vs. Law		68	.25 ±	.077	13	-.30 ±	.170
Total vs. Av. First 3		51	.46 ±	.075	12	.32 ±	.175
Total vs. Av. All 4		51	.40 ±	.079	12	.11 ±	.193
Orientation B							
Verbal vs. Auditing		27	.28 ±	.120			
Verbal vs. Theory		25	-.01 ±	.135			
Verbal vs. Problems		29	.15 ±	.123			
Verbal vs. Law		26	.11 ±	.131			
Verbal vs. Av. First 3		20	.20 ±	.145			
Verbal vs. Av. All 4		19	.28 ±	.142			
Quant. vs. Auditing		27	.23 ±	.123			
Quant. vs. Theory		25	.34 ±	.120			
Quant. vs. Problems		29	.46 ±	.099			
Quant. vs. Law		26	.29 ±	.121			
Quant. vs. Av. First 3		20	.44 ±	.122			
Quant. vs. Av. All 4		19	.45 ±	.123			
Total vs. Auditing		27	.27 ±	.121			
Total vs. Theory		25	.06 ±	.135			
Total vs. Problems		29	.23 ±	.119			
Total vs. Law		26	.16 ±	.129			
Total vs. Av. First 3		20	.26 ±	.141			
Total vs. Av. All 4		19	.33 ±	.138			

All of the correlations for Orientation Test, Form A, based on the combined groups are positive. Thirteen of the eighteen correlations are statistically significant (at least four times the probable error). These r 's range from .16 to .52, with a median of .335. In general, the quantitative score seems to agree more closely with the results of the CPA Examination than does the verbal score. Of the separate CPA Examination sections problems and auditing tend to have the highest correlation with scores on this form of the Orientation Test. The averages show consistently higher correlations than any of the separate section correlations.

When the correlations for the total combined group are compared with the r 's reported in the earlier study two trends are quite apparent: (1) the total group does not yield such an extreme range of correlations as found in the initial study (from -.30 to .64) and (2) the correlations for the larger group tend to run higher, the median for the initial study being only .265. Actually, the N 's upon which the previous correlations were based are not large enough to yield reliable results. With such small population samples considerable fluctuation will be expected.

In the combined group, enough cases were found to provide a small population for studying relationships between scores on Orientation Test, Form B, taken at the first-year level and grades on the CPA Examinations. These correlations are reported in the lower section of the table. In this instance, the N 's are not a great deal larger than those on which the initial correlations for the Orientation Test, Form A, were based. The Form B r 's range from -.01 to .46 and only one (quantitative score vs. problems) is of statistical significance; yet, the same trends noted for Form A are found with the Form B data. The quantitative score shows a higher degree of relationship with CPA Examination grades than does the verbal score, and the auditing and problems sections tend to have the higher correlations. Again, the averages show higher r 's than do the separate parts.

From the combined 1950 and 1951 CPA Examination groups fairly substantial numbers of examinees were identified who had taken either Orientation Test, Form A or Form B, in the senior year of study in college. The correlations between Orientation Test scores and CPA Examination grades for these groups are shown in Table XII.

The correlations reported for examinees taking the Orientation Test as college seniors in the initial study are shown in the columns to the right in Table XII. In comparing the follow-up correlations with the initially reported r 's no great differences are to be observed. There is, perhaps, a slight increase in the coefficients when the new cases are added to the group on which the earlier report was based, but the correlations for the May, 1950, group tended to run fairly high. Because of the increased N the probable errors are reduced for the follow-up data. All but two of the eighteen correlations for Orientation Test, Form A, are of statistical significance for the total group, while only six of the initially reported r 's are as much as four times the probable error.

The follow-up correlations for Orientation A range from .32 to .54, with a median of .435. As with the first-year group, the auditing and problems sections have generally the best correlations with Orientation Test scores, with the law section showing the poorest correlations. The correlations with averages, again, run higher than the separate section correlations and are high enough to suggest substantial relationships between averages and scores on this form of the Orientation Test.

TABLE XII

CORRELATIONS OF RAW SCORES ON ORIENTATION TESTS TAKEN
BY SENIOR ACCOUNTING STUDENTS IN COLLEGE
WITH GRADES ON CPA EXAMINATIONS TAKEN SOME YEARS LATER

Test	CPA Examination	Accumulated Data May, 1951			Data From Previous Study		
		N	<u>r</u>	P.E.	N	<u>r</u>	P.E.
Orientation A							
Verbal vs. Auditing		48	.39 ±	.083	25	.41 ±	.112
Verbal vs. Theory		49	.36 ±	.084	25	.37 ±	.116
Verbal vs. Problems		38	.37 ±	.095	25	.39 ±	.114
Verbal vs. Law		46	.32 ±	.089	25	.25 ±	.126
Verbal vs. Av. First 3		36	.47 ±	.088	25	.43 ±	.110
Verbal vs. Av. All 4		35	.47 ±	.088	25	.45 ±	.107
Quant. vs. Auditing		48	.38 ±	.083	25	.36 ±	.117
Quant. vs. Theory		49	.34 ±	.086	25	.28 ±	.124
Quant. vs. Problems		38	.52 ±	.080	25	.51 ±	.100
Quant. vs. Law		46	.48 ±	.076	25	.32 ±	.121
Quant. vs. Av. First 3		36	.54 ±	.079	25	.46 ±	.106
Quant. vs. Av. All 4		35	.52 ±	.083	25	.43 ±	.120
Total vs. Auditing		48	.44 ±	.078	25	.43 ±	.110
Total vs. Theory		49	.41 ±	.081	25	.28 ±	.124
Total vs. Problems		38	.43 ±	.089	25	.52 ±	.098
Total vs. Law		46	.36 ±	.087	25	.33 ±	.120
Total vs. Av. First 3		36	.54 ±	.080	25	.55 ±	.094
Total vs. Av. All 4		35	.53 ±	.082	25	.51 ±	.100
Orientation B							
Verbal vs. Auditing		39	.36 ±	.094			
Verbal vs. Theory		40	.44 ±	.086			
Verbal vs. Problems		42	.14 ±	.102			
Verbal vs. Law		41	.27 ±	.098			
Verbal vs. Av. First 3		38	.42 ±	.090			
Verbal vs. Av. All 4		38	.47 ±	.086			
Quant. vs. Auditing		39	.22 ±	.103			
Quant. vs. Theory		40	.35 ±	.094			
Quant. vs. Problems		42	.44 ±	.084			
Quant. vs. Law		41	-.05 ±	.105			
Quant. vs. Av. First 3		38	.48 ±	.084			
Quant. vs. Av. All 4		38	.41 ±	.091			
Total vs. Auditing		39	.37 ±	.093			
Total vs. Theory		40	.50 ±	.080			
Total vs. Problems		42	.27 ±	.097			
Total vs. Law		41	.10 ±	.105			
Total vs. Av. First 3		38	.52 ±	.080			
Total vs. Av. All 4		38	.53 ±	.079			

The groups upon which the Orientation B correlations are based in Table XII are larger than those forming the basis of the Form B correlations in Table XI. Again, the Form B correlations tend to run lower than those for Orientation A. For the examinees taking Orientation B as seniors the correlations range from $-.05$ to $.53$, with a median of $.39$. In this particular set of correlations the theory section seems to show a closer degree of relationship to verbal, quantitative, and total scores than do the other separate sections, although the data agree with the Form A correlations in that the law section shows the lowest correlations and the averages show consistently high degrees of relationship with the test scores.

A fairly substantial number of the examinees found in the combined group had taken Orientation Test, Form A, while in either the second or third year of accounting study. The groups for these two were combined to form the population on which the Table XIII data are based.

TABLE XIII

CORRELATIONS OF RAW SCORES ON ORIENTATION TESTS TAKEN
BY SECOND AND THIRD YEAR ACCOUNTING STUDENTS IN COLLEGE
WITH GRADES ON CPA EXAMINATIONS TAKEN SOME YEARS LATER

Test	CPA Examination	Accumulated Data May, 1951			Data From Previous Study		
		N	\bar{r}	P.E.	N	\bar{r}	P.E.
Orientation A							
Verbal vs. Auditing		39	$.04 \pm$	$.108$	15	$.02 \pm$	$.174$
Verbal vs. Theory		35	$.44 \pm$	$.092$	10	$.21 \pm$	$.204$
Verbal vs. Problems		37	$.18 \pm$	$.107$	14	$.26 \pm$	$.168$
Verbal vs. Law		36	$.20 \pm$	$.108$	12	$.10 \pm$	$.192$
Verbal vs. Av. First 3		29	$.39 \pm$	$.106$	10	$.21 \pm$	$.204$
Verbal vs. Av. All 4		29	$.33 \pm$	$.111$	10	$.21 \pm$	$.204$
Quant. vs. Auditing		39	$.04 \pm$	$.108$	15	$-.10 \pm$	$.173$
Quant. vs. Theory		35	$.14 \pm$	$.111$	10	$.26 \pm$	$.199$
Quant. vs. Problems		37	$.19 \pm$	$.107$	14	$.04 \pm$	$.180$
Quant. vs. Law		36	$.20 \pm$	$.108$	12	$.21 \pm$	$.186$
Quant. vs. Av. First 3		29	$.27 \pm$	$.116$	10	$.18 \pm$	$.207$
Quant. vs. Av. All 4		29	$.20 \pm$	$.121$	10	$.24 \pm$	$.201$
Total vs. Auditing		39	$.08 \pm$	$.108$	15	$-.11 \pm$	$.172$
Total vs. Theory		35	$.45 \pm$	$.091$	10	$.14 \pm$	$.209$
Total vs. Problems		37	$.25 \pm$	$.105$	14	$.15 \pm$	$.176$
Total vs. Law		36	$.19 \pm$	$.108$	12	$.06 \pm$	$.194$
Total vs. Av. First 3		29	$.45 \pm$	$.101$	10	$.08 \pm$	$.212$
Total vs. Av. All 4		29	$.38 \pm$	$.107$	10	$.12 \pm$	$.210$

The data shown from the earlier report in the right-hand portion of the table are based on a very small sampling of second year students. The correlations based on the larger N's in the combined group do not show as large a range as the \bar{r} 's based on the smaller population, and the \bar{r} 's tend to run substantially higher in the follow-up data, particularly for the

averages. The follow-up coefficients range from .04 to .45, with a median of .20. It is interesting to note that in this set of correlations the auditing section shows the lowest degree of relationship and the theory section tends to have the higher \bar{r} 's. Correlations for both problems and law tend to run rather low. The correlations for the averages are relatively high, although only one, that for total score vs. average of the first three sections, is as high as four times the probable error.

In view of the complicating circumstances outlined in the earlier part of this paper, these data for the Orientation Test would seem to indicate promising signs of relationship between scores on the objective tests and grades on the CPA Examination, particularly for the CPA averages. All but two of the ninety correlations reported in Tables XI through XIII are positive, and forty-two of the ninety are statistically significant. Eighteen of the thirty \bar{r} 's for the averages are statistically significant. In most of the instances where the correlation for the average is less than four times the probable error, the size of the N for the average is so small that fairly large \bar{r} 's would be necessary to exceed the probable error by four times.

Achievement Test Data

Table XIV presents correlations obtained between scores on the Level II Achievement Test taken by members of the CPA Examination group while they were seniors in college and grades on the CPA Examinations.

The follow-up correlations for the Level II Achievement Test range from .11 to .73 and have a median of .46. Level II-D seems to show the highest degrees of relationship with CPA Examination grades and Level II-A shows generally the lowest correlations for the separate parts. However, the II-A correlations with the two averages tend to run about as high as the correlations between the other forms of the test and the averages. The problems section has generally the highest \bar{r} 's, with the theory and auditing sections following in that order. The law section shows the lowest degree of relationship with Achievement Test scores. The averages show consistently high \bar{r} 's throughout. The correlation of .73 obtained between Level II-D and average of the first three CPA Examinations is as high as correlations found frequently between results of separate forms of the same test.

In comparing the follow-up data with the \bar{r} 's reported for the May, 1950, group, one observes a fair degree of agreement. Fourteen of the twenty-four follow-up correlations are statistically significant, and eight of the sixteen initially reported \bar{r} 's are as high as or higher than four times the probable error.

Correlations between the theory and problems sections and Level II scores tend to run noticeably higher than the corresponding correlations for Orientation Test scores. The \bar{r} 's for averages vs. Level II scores also surpass generally the Orientation Test \bar{r} 's for averages.

TABLE XIV

CORRELATIONS OF RAW SCORES ON THE LEVEL II ACHIEVEMENT
TESTS TAKEN BY SENIOR ACCOUNTING STUDENTS IN COLLEGE
WITH GRADES ON CPA EXAMINATIONS TAKEN SOME YEARS LATER

Achievement Test	CPA Examination	Accumulated Data May, 1951			Data From Previous Study		
		N	\bar{r}	P.E.	N	\bar{r}	P.E.
Level II-A vs. Auditing		53	.18 ± .090		17	.19 ± .157	
Level II-A vs. Theory		61	.22 ± .082		21	.31 ± .133	
Level II-A vs. Problems		59	.25 ± .083		28	.18 ± .124	
Level II-A vs. Law		53	.11 ± .092		15	.11 ± .172	
Level II-A vs. Av. First 3		38	.46 ± .087		Insufficient Data		
Level II-A vs. Av. All 4		37	.61 ± .070		Insufficient Data		
Level II-B vs. Auditing		64	.23 ± .080		32	.20 ± .115	
Level II-B vs. Theory		70	.40 ± .068		35	.55 ± .080	
Level II-B vs. Problems		67	.57 ± .056		35	.65 ± .066	
Level II-B vs. Law		60	.14 ± .085		30	.15 ± .120	
Level II-B vs. Av. 1st 3		54	.55 ± .064		Insufficient Data		
Level II-B vs. Av. All 4		53	.51 ± .069		Insufficient Data		
Level II-C vs. Auditing		34	.28 ± .107				
Level II-C vs. Theory		31	.56 ± .083				
Level II-C vs. Problems		30	.59 ± .081				
Level II-C vs. Law		28	.27 ± .119				
Level II-C vs. Av. 1st 3		20	.48 ± .116				
Level II-C vs. Av. All 4		19	.46 ± .123				
Level II-D vs. Auditing		64	.42 ± .070		18	.40 ± .134	
Level II-D vs. Theory		63	.50 ± .065		18	.43 ± .130	
Level II-D vs. Problems		61	.67 ± .048		17	.64 ± .097	
Level II-D vs. Law		60	.28 ± .080		17	.07 ± .163	
Level II-D vs. Av. 1st 3		60	.73 ± .041		14	.67 ± .099	
Level II-D vs. Av. All 4		59	.57 ± .059		14	.63 ± .109	

Effect of Experience

After analyzing the preliminary data, Kane and Traxler³ suggested that classification of population according to amount of accounting experience might provide a clearer indication of possible relationships between CPA examination grades and scores on the objective tests. In line with this suggestion cases accumulated through May, 1951, were classified according to amount of experience. Only two categories of experience were set up, these being (1) less than two years of experience and (2) two or more years of experience. By far the majority of cases fell into the first category. Actually, the number of individuals with two or more years of work experience was too small to warrant computation of correlation coefficients for this group. Rather, correlations were computed between test scores and CPA Examination grades of groups of individuals ranging from no experience to two years of experience, with the examinees having two or more years of experience omitted. This reduction of N to provide more homogeneous

³Robert L. Kane, Jr. and Arthur E. Traxler, op. cit., p. 33.

populations with respect to experience resulted in so little change in the correlation coefficients that reporting of the data is not warranted. There was no evidence from this separation of cases to support the suggestion that the correlations might be increased by classifying the population into fairly similar work experience groupings. However, the categorizing of experience was necessarily arbitrary since by far the majority of cases for which data were available fell into the two years or less range of experience. Further study of the effect of the experience factor would be necessary before one could safely generalize concerning its influence.

Other studies of examination results indicate that college graduates with one-half to two years of public accounting experience are considerably more likely to succeed in the CPA Examinations, especially in the subject of auditing, than those with no experience. Therefore, a subdivision of examinees on that basis may be significant.

During this study of relationships between the CPA Examination grades and the objective test scores it became possible through the cooperation of two separate state examining boards to set up an experimental testing arrangement whereby Orientation Test, Form A, and Achievement Test, Level II, Form C, were given to the candidates reporting to these boards for examination. The two objective tests were given a short time after the administration of the CPA Examinations, which included the usual sections on auditing, accounting theory, accounting problems, and law. The two groups cooperating in this testing were drawn from the same general geographic area. The results are of particular interest in that some of the limiting factors suggested in the early part of this paper were at least partially controlled. The examinees contributing these data took the tests under uniform conditions while the data on which the correlations in Tables XI through XIV are based were drawn from a wide range of testing conditions.

Correlations obtained in the supplementary study were presented as an interim report appearing in Bulletin No. 19.⁴ In order to compare the results of this controlled testing with the results from the widespread gathering of data, the data shown in the interim article are repeated in Table XV.

These correlations tend to run fairly high throughout and, with a few exceptions, tend to agree with the patterns of relationship established in the other studies. One rather noticeable difference is the trend toward fairly high correlations for the law section with Orientation Test scores. In most of the other studies the law section showed the lowest correlation with objective test scores. The Orientation Test correlations in Table XV also show lower degrees of relationship with the theory section than found in the other related studies. This different pattern of relationships may be due partly to sampling variations, but probably it is also explained in some measure by differences in the CPA Examination from year to year. Although the sections of the CPA Examination are constructed with the same objective in mind from year to year and although there is an attempt to incorporate uniformity and comparability in the makeup of the tests from year to year, the content of the test may vary from time to time so that the skills measured by the Orientation Test may be required in less degree with one examination than with another.

⁴Results of the Fall, 1953, College Accounting Testing Program, pp. 8-9. The American Institute of Accountants College Accounting Testing Program. Bulletin No. 19. New York: Committee on Accounting Personnel, January, 1954.

TABLE XV

CORRELATIONS OF ORIENTATION AND ACHIEVEMENT TEST SCORES WITH GRADES
ON CPA EXAMINATIONS TAKEN BY TWO GROUPS OF CPA EXAMINATION CANDIDATES

CPA Examination	N	Achievement Test, Level II, Form C		Orientation Test, Form A					
		<u>r</u>	P.E.	Verbal		Quant.		Total	
				<u>r</u>	P.E.	<u>r</u>	P.E.	<u>r</u>	P.E.
Auditing	26	.59	± .086	.41	± .110	.27	± .123	.36	± .115
Theory	28	.58	± .085	.21	± .122	.33	± .114	.24	± .121
Problems	28	.72	± .061	.29	± .117	.48	± .098	.41	± .106
Law	27	.45	± .103	.52	± .095	.34	± .115	.50	± .098
Average First 3	23	.67	± .078	.43	± .115	.39	± .120	.42	± .117
Average All 4	23	.72	± .068	.53	± .102	.47	± .111	.53	± .101

All the correlations shown in Table XV for Achievement Test, Level II, scores are statistically significant. Two of the correlations, accounting practice vs. II-C and average of the four CPA Examination grades vs. II-C, are as large as is frequently found with test re-test relationships using the same instrument. The lowest correlation for the Achievement Test is found with the law section of the CPA Examination. Logically, this would be expected, since the content of the Level II test does not cover items of commercial law. The degree of relationship found in this supplementary study between Achievement Test scores and average CPA Examination grades is high enough to indicate that for this particular group overall performance on the CPA Examination could have been predicted with some degree of accuracy from the Level II-C score.

Summary

The data reported in this article may be summarized by showing the medians of the correlations reported in Tables XI through XV for each of the objective test scores vs. each of the CPA Examination grades. These are shown in Table XVI.

TABLE XVI

MEDIAN CORRELATIONS DRAWN FROM DATA IN TABLES XI-XV

Objective Test	CPA Examination	<u>r</u>
Orientation Verbal	vs. Auditing	.320
Orientation Verbal	vs. Theory	.290
Orientation Verbal	vs. Problems	.195
Orientation Verbal	vs. Law	.235
Orientation Verbal	vs. Average First 3	.405
Orientation Verbal	vs. Average All 4	.400
Orientation Quantitative	vs. Auditing	.250
Orientation Quantitative	vs. Theory	.335
Orientation Quantitative	vs. Problems	.470
Orientation Quantitative	vs. Law	.310
Orientation Quantitative	vs. Average First 3	.430
Orientation Quantitative	vs. Average All 4	.430
Orientation Total	vs. Auditing	.365
Orientation Total	vs. Theory	.355
Orientation Total	vs. Problems	.325
Orientation Total	vs. Law	.220
Orientation Total	vs. Average First 3	.455
Orientation Total	vs. Average All 4	.465
Achievement, Level II	vs. Auditing	.280
Achievement, Level II	vs. Theory	.500
Achievement, Level II	vs. Problems	.590
Achievement, Level II	vs. Law	.270
Achievement, Level II	vs. Average First 3	.550
Achievement, Level II	vs. Average All 4	.570

This summary of results suggests that there is a definite relationship between scores on the objective tests and CPA Examination grades. For most of the CPA Examination grades the quantitative score on the Orientation Test appears to be a better predictor than the verbal score and the total score on the Orientation Test shows an encouraging degree of relationship with all but the law section of the CPA Examination grades. The Level II Achievement Test scores seem to relate more closely to grades on the theory and problems sections than to marks received in auditing and law. The median correlations between averages and objective test scores are consistently high throughout ranging from .40 to .57. This is the range of correlations usually expected in establishing favorable relationships between scores on objective tests and grades received in scholastic work in schools and colleges.

These data do indicate possible usefulness of the objective tests in screening applicants for the CPA Examination, although such use of the tests would need to be made cautiously until more definite information is available regarding the accuracy of prediction which may be provided. Additional studies are planned along the line of the controlled testing reported as a supplementary study in this article.

A FURTHER NOTE ON THE CORRELATION OF SCORES ON THE
HIGH SCHOOL ACCOUNTING ORIENTATION TEST WITH INTELLIGENCE

by Arthur E. Traxler

The High School Accounting Orientation Test is designed for use in counseling students who are approaching the end of their high school course concerning choice of accounting as a career. It consists of three parts--verbal, arithmetic reasoning, and accounting problems--and yields scores for these three parts, as well as a total score. There are two forms of the test--Form S and Form T. Each form calls for forty minutes of working time. There are percentile norms for high school seniors on each form of the test.

Forms S and T were prepared in the spring of 1953 after a variety of test items had been tried out in four experimental forms. Correlations of scores on the experimental forms with results of the Otis Self-Administering Test of Mental Ability and the American Council on Education Psychological Examination were reported in Bulletin No. 18.¹ Medians of the correlations of the parts of the Orientation Test with the other two tests ranged from .45 to .68. The median correlation of the total score on the Orientation Test was .69 with Otis IQ, .65 with ACE verbal score, and .64 with ACE quantitative score. It was apparent that the experimental edition of the Orientation Test had a good deal in common with two widely used tests of mental ability.

In the spring of 1954 intelligence test data were obtained for seniors in four high schools who had taken the final forms of the Orientation Test. The seniors in three of these high schools took Form T in connection with the standardization of this form; those in the other school took Form S. A different test of mental ability was used in each of the four high schools. The intelligence tests involved were the Otis Self-Administering Test of Mental Ability, Higher Examination, Form C; the Otis Quick-Scoring Mental Ability Test, Beta; the California Test of Mental Maturity, Advanced 1947 Edition; and the California Capacity Questionnaire.

Correlations of the part scores and total scores on the High School Accounting Orientation Test with IQ's on the different intelligence tests are shown in Table XVII.

It will be observed that the correlations of the Orientation Test with the Otis Self-Administering Test and the California Test of Mental Maturity are rather high and are in close agreement. The correlations between the Orientation Test and the Otis Quick-Scoring Test and between the Orientation Test and the California Capacity Questionnaire are somewhat lower than those for the other two intelligence tests. However, all these correlations are statistically significant except the one between the accounting problems part of the Orientation Test and the Otis Quick-Scoring Test.

¹"A Note on the Correlation of a New High School Accounting Orientation Test with the Otis Quick-Scoring Mental Ability Test and with the American Council on Education Psychological Examination," Results of the Spring, 1953, College Accounting Testing Program, pp. 18-20. New York: Committee on Development of Accounting Personnel, July, 1953.

TABLE XVII

CORRELATIONS OF SCORES OF HIGH SCHOOL SENIORS ON HIGH SCHOOL
ACCOUNTING ORIENTATION TEST WITH INTELLIGENCE QUOTIENTS
DERIVED FROM FOUR TESTS OF MENTAL ABILITY*

Tests	School 1 Otis S-A Form C			School 2 Otis Q-S Beta			School 3 Calif. M.M. Advanced			School 4 Calif.Cap. Question.			Median <u>r</u>
	N	<u>r</u>	P.E.	N	<u>r</u>	P.E.	N	<u>r</u>	P.E.	N	<u>r</u>	P.E.	
Orientation Vocabulary	116	.672 [†]	.034	28	.555 [†]	.088	49	.689 [†]	.051	90	.518 [†]	.052	.614
Orientation Arith.Reason.	116	.728 [†]	.029	28	.529 [†]	.092	49	.700 [†]	.049	90	.573 [†]	.048	.637
Orientation Acct.Problems	116	.652 [†]	.036	28	.211 [†]	.122	49	.623 [†]	.059	90	.564 [†]	.048	.594
Orientation Total Score	116	.787 [†]	.024	28	.523 [†]	.093	49	.758 [†]	.041	90	.649 [†]	.041	.704

*Correlations with Otis Beta are for Form S of the Orientation Test; Form T results were used in the other correlations.

The medians of the correlations of the vocabulary and arithmetic reasoning parts of the Orientation Test with the intelligence tests are a little above .60; the median of the correlation between accounting problems and the tests of mental ability is not quite up to .60; and the median of the correlations between the Orientation Test total score and the intelligence tests is approximately .70. The apparent tendency of vocabulary and arithmetic reasoning to be a little more closely associated with intelligence than accounting problems with intelligence agrees with what one would logically expect. Vocabulary and arithmetic reasoning are dependent to a considerable degree upon native capacity, while the accounting problems section may reflect to a great extent what has been studied in school.

When the results in this report are considered along with those reported in Bulletin No. 18 it may be said with a fair degree of confidence that the total score on the Orientation Test tends to be correlated to the extent of about .65 to .70 with tests of general intelligence or scholastic aptitude. The degree of association between the Orientation Test and tests of general intelligence approaches, but is a little lower than, that usually found between two general intelligence tests. This is in accordance with what one would expect to find for a well-designed test of broad aptitudes characteristic of a particular professional or vocational field.