

**SOUTH CAROLINA
END-OF-COURSE EXAMINATION PROGRAM**

2013–14 OPERATIONAL TEST TECHNICAL REPORT



Issued by the
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**Office of Assessment
Division of Accountability**

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CHAPTER 1

HISTORY AND OVERVIEW

The South Carolina Education Accountability Act of 1998 requires the administration of end-of-course examinations in gateway courses for which credit in English language arts, mathematics, science, and social studies is awarded. Students must take the appropriate End-of-Course Examination Program (EOCEP) tests if they are enrolled in courses in which the curriculum standards for Algebra 1, Mathematics for the Technologies 2, English 1, Biology 1, Applied Biology 2, and U.S. History and the Constitution are taught.

As they are enunciated in State Board of Education Regulation 43-262.4, the purposes and uses of the EOCEP tests are as follows:

- A. The tests shall promote instruction in the specific academic standards for the courses, encourage student achievement, and document the level of students' mastery of the curriculum standards.
- B. The tests shall serve as indicators of program, school, and school district effectiveness in the manner prescribed by the Education Oversight Committee in accordance with the provisions of the Education Accountability Act of 1998 (EAA).
- C. The tests shall be weighted 20 percent in the determination of students' final grades in the gateway courses.

EOCEP exams are reported on the basis of the South Carolina uniform grading scale (UGS). The score reported is a scale score and not the percentage of correct answers.

The Algebra 1/Mathematics for the Technologies 2 end-of-course examination was implemented in the baseline year 2002–03 and was operational for the first time in 2003–04. The English 1, Physical Science, and Biology 1/Applied Biology 2 examinations that were field-tested in May 2003 were implemented for the baseline year in 2003–04. These subject-area EOCEP examinations became operational in 2004–05. The Biology 1/Applied Biology 2 examination was discontinued after the 2005–06 school year. The State Board of Education reinstated the Biology test with a field test in 2008. Additional field testing was conducted in spring 2009. The 2009–10 school year was an implementation year for Biology. The first operational administration for Biology was fall 2010. The last administration of Physical Science was in spring 2011. The U.S. History and Constitution examination was field-tested in 2005–06, with baseline implementation in 2006–07 and a second implementation in 2007–08. The first operational administration was in 2008–09.

The South Carolina Department of Education (SCDE) awarded the contract for the development and scoring of the EOCEP tests in October 2001 to American Institutes for Research (AIR) and its partners Insite, Inc., and Pearson Educational Measurement (PEM). In spring 2007, Pearson became the sole contractor. In fall 2008, Data Recognition Corporation (DRC) took over administration, while Pearson remained the development contractor. These contractors have undertaken a number of development, review, implementation, and data analysis activities. DRC became the sole contractor in mid-2013.

All EOCEP exams contain only multiple-choice operational items. Rasch-ability-score-to-scale-score conversion tables were produced prior to each test administration on the basis of the item parameters in the pre-equated item pool. This technical report summarizes the results of statistical and psychometric analyses performed on the current year's operational data.

In this report, all data are based on the students in public middle and high schools or adult education programs only. Data on students in district-approved homeschools have been excluded.

CHAPTER 2

STUDENT DEMOGRAPHICS

2.1 STUDENT PARTICIPATION

All schools administered EOCEP tests to students who completed courses, in which the standards for Algebra 1, Mathematics for the Technologies 2, Biology 1, Applied Biology 2, U.S. History and the Constitution, or English 1 were taught. Summary data are reported for operational tests only.

Demographic data were collected for each student. These data included the categories of gender, race/ethnicity, grade, English language proficiency (LEP, limited English proficiency), free/reduced-price meal program participation, Individualized Education Plan (IEP) or 504 Accommodation Plan status, disability status, and migrant status. Table 2.1 presents the combined student participation in the three EOCEP administrations (fall, spring, and summer) by the demographic variables.

Table 2.1
Summary of 2013-14 Student Demographics in the Sample

Demographics	Algebra 1/ Math Tech 2		Biology		English 1		US Hist. & Const.	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Overall	58,663	100.00	53,465	100.00	56,258	100.00	47,752	100.00
Gender								
Female	28,802	49.10	26,485	49.54	27,582	49.03	23,955	50.17
Male	29,570	50.41	26,705	49.95	28,338	50.37	23,443	49.09
Unknown	291	0.50	275	0.51	338	0.60	354	0.74
Grade								
6	31	0.05	0	--	0	--	0	--
7	2,960	5.05	0	--	4	0.007	0	--
8	14,571	24.84	35	0.07	12,162	21.62	1	0.00
9	31,255	53.28	21,005	39.29	43,133	76.67	571	1.20
10	8,804	15.01	30,268	56.61	538	0.96	5,679	11.89
11	598	1.02	1,349	2.52	101	0.18	38,497	80.62
12	201	0.34	514	0.96	54	0.10	2,654	5.56
Adult education	33	0.06	34	0.06	18	0.03	83	0.17
Other	210	0.36	260	0.49	248	0.44	267	0.56
Ethnicity								
Hispanic or Latino	3,497	5.96	3,083	5.77	3,348	5.95	2,502	5.24
American Indian or Alaska Native	176	0.30	174	0.33	165	0.29	126	0.26
Asian	818	1.39	767	1.43	775	1.38	744	1.56
Black or African American	19,484	33.21	18,083	33.82	18,781	33.38	16,259	34.05
Native Hawaiian or Other Pacific Islander	69	0.12	90	0.17	66	0.12	58	0.12
White	32,344	55.14	29,465	55.11	30,908	54.94	26,194	54.85
Two or More Races	1,485	2.53	1,126	2.11	1,460	2.60	1,021	2.14
Other	790	1.35	677	1.27	755	1.34	848	1.78

Table 2.1
Summary of 2013-14 Student Demographics in the Sample

Cont'd								
Language								
Parent waiver	29	0.05	23	0.04	14	0.02	25	0.05
Pre-functional	180	0.31	157	0.29	182	0.32	85	0.18
Beginner	205	0.35	183	0.34	221	0.39	148	0.31
Intermediate	446	0.76	421	0.79	431	0.77	296	0.62
Advanced	1,458	2.49	1,040	1.95	1,460	2.60	697	1.46
Initially English Proficient	12	0.02	18	0.03	6	0.01	13	0.03
Title III First Year Exited	171	0.29	249	0.47	149	0.26	297	0.62
Title III Second + Year Exited	145	0.25	103	0.19	98	0.17	272	0.57
English Speaker I	547	0.93	583	1.09	532	0.95	470	0.98
English Speaker II	54,191	92.38	49,660	92.88	51,881	92.22	44,131	92.42
Other	1,279	2.18	1,028	1.92	1,284	2.28	1,318	2.76
Lunch								
Free meals	26,276	44.79	23,186	43.37	25,819	45.89	19,033	39.86
Reduced-price meals	3,902	6.65	3,475	6.50	3,793	6.74	3,016	6.32
No free/reduced-price meals	28,485	48.56	26,804	50.13	26,646	47.36	25,703	53.83
IEP								
Yes	5,399	9.20	5,132	9.60	5,520	9.81	3,858	8.08
No	53,264	90.80	48,333	90.40	50,738	90.19	43,894	91.92
Migrant								
Yes	12	0.02	11	0.02	12	0.02	10	0.02
No	58,651	99.98	53,454	99.98	56,246	99.98	47,742	99.98
Gifted/talented								
Academic	10,281	17.53	7,098	13.28	9,053	16.09	4,081	8.55
Artistic	1,235	2.11	1,000	1.87	1,238	2.20	1,233	2.58
Both	1,401	2.39	597	1.12	1,217	2.16	354	0.74
No	45,746	77.98	44,770	83.74	44,750	79.54	42,084	88.13
504 Plan								
Yes	1,155	1.97	1,090	2.04	1,209	2.15	993	2.08
No	57,508	98.03	52,375	97.96	55,049	97.85	46,759	97.92
Accommodations								
Yes	1,049	1.79	1,078	2.02	1,160	2.06	804	1.68
No	57,614	98.21	52,387	97.98	55,098	97.94	46,948	98.32

Note: Includes all students who attempted the test except home school students.

2.2 ACCOMMODATIONS

Supplemental information regarding the administration of the EOCEP to students with disabilities is contained in Appendix C of the EOCEP Test Administration Manuals (SCDE 2013b and 2014b). These manuals provide guidelines for IEP teams in making decisions about testing students with disabilities and give specific information regarding standard and non-standard testing accommodations, customized test forms and materials, and test administration procedures.

A student with a documented disability is one who has been evaluated and found to meet the eligibility criteria for enrollment in special education as defined by the 1997 amendments to the Individuals with Disabilities Education Act and by South Carolina State Board of Education Regulation 43-243.1, or one who has a disability covered under Section 504 of the Rehabilitation Act of 1973. The IEP or 504 Accommodation Plan team determines how a student with disabilities participates in the EOCEP assessments. Decisions about standard and non-standard accommodations must be made on an individual student basis, not on the basis of the category of disability or instructional placement. Table 2.2 presents the percentages of standard accommodations used in the current year's testing.

Table 2.2
Percentages of Students Using Accommodations in 2013–14 EOCEP Testing

Accommodations	Algebra 1/ Math Tech 2	Biology	English 1	US Hist. & Const.
Regular Form				
	(N =58,635)	(N =53,427)	(N =56,228)	(N =47,732)
Setting	1.65	1.84	1.93	1.54
Timing	0.09	0.12	0.14	0.11
Scheduling	0.02	0.03	0.02	0.03
Response options	0.08	0.08	0.06	0.08
Presentation	0.38	0.44	0.44	0.33
Supplemental Materials	0.07	0.05	0.05	0.04
Customized Form				
	(N =28)	(N =38)	(N =30)	(N =20)
Setting	3.57	26.32	6.67	45.00
Timing	3.57	--	3.33	10.00
Scheduling	--	2.63	--	--
Response options	3.57	2.63	6.67	35.00
Presentation	21.43	21.05	6.67	40.00
Supplemental Materials	3.57	2.63	3.33	25.00

Note: Includes all students who attempted the test except home school students.

Total responses in each column for the Customized Form may exceed 100 percent because some students received accommodations in more than one category.

2.3 TEST ADMINISTRATION TIME

For online testing, start and stop times were recorded automatically. For paper-and-pencil testing, students were asked to record on their answer documents the exact times that they started and finished the test. The total elapsed time was calculated for each student. (It was not possible to calculate a total testing time for students with incomplete or invalid data.) Total elapsed time may be influenced by the presence of field test items on some forms. The majority of students finished the test within two hours, as tables 2.3 and 2.4 reflect.

Table 2.3
Percentages of Students by Testing-Time Intervals in 2013–14 EOCEP Testing
(with Regular Forms)

	Algebra 1/Math Tech 2			Biology		
	Fall 2013 (N =7,740)	Spring 2014 (N =50,708)	Summer 2014 (N =187)	Fall 2013 (N =12,997)	Spring 2014 (N =40,368)	Summer 2014 (N =62)
Less than 15 min	0.14	0.09	--	0.15	0.08	--
15 min - 29 min	0.79	0.49	1.60	2.57	2.02	6.45
30 min - 44 min	4.78	2.07	8.02	19.45	16.01	33.87
45 min - 59 min	15.49	7.73	13.37	31.76	28.97	22.58
1 hr - 1 hr 14 min	24.55	15.84	29.95	23.44	24.34	17.74
1 hr 15 min - 1 hr 29 min	20.31	19.06	20.86	11.53	13.51	1.61
1 hr 30 min - 1 hr 44 min	14.21	17.00	11.76	5.33	7.07	1.61
1 hr 45 min - 1 hr 59 min	8.00	13.09	8.02	2.59	3.40	9.68
2 hr - 2 hr 14 min	5.12	8.74	2.14	1.25	1.81	4.84
2 hr 15 min - 2 hr 29 min	2.33	5.25	1.07	0.52	0.87	--
2 hr 30 min - 2 hr 44 min	1.33	3.47	1.07	0.34	0.49	--
2 hr 45 min - 2 hr 59 min	0.89	2.16	1.07	0.25	0.23	--
3 hr or more	1.20	4.07	0.53	0.35	0.76	1.61
Invalid*	0.87	0.93	0.53	0.46	0.45	--

	English 1			US History and Constitution		
	Fall 2013 (N =7,273)	Spring 2014 (N =48,874)	Summer 2014 (N =81)	Fall 2013 (N =10,322)	Spring 2014 (N =37,336)	Summer 2014 (N =74)
Less than 15 min	0.08	0.06	--	0.09	0.09	1.35
15 min - 29 min	0.63	0.30	1.23	5.44	3.24	14.86
30 min - 44 min	5.98	1.84	13.58	27.14	20.96	33.78
45 min - 59 min	17.57	7.48	28.40	31.80	29.96	22.97
1 hr - 1 hr 14 min	24.80	15.29	19.75	18.75	22.07	6.76
1 hr 15 min - 1 hr 29 min	19.70	18.44	12.35	8.53	11.48	5.41
1 hr 30 min - 1 hr 44 min	13.53	16.67	11.11	3.50	5.54	12.16
1 hr 45 min - 1 hr 59 min	7.05	12.93	4.94	1.54	2.74	--
2 hr - 2 hr 14 min	4.63	9.30	4.94	0.82	1.44	1.35
2 hr 15 min - 2 hr 29 min	2.64	6.20	1.23	0.37	0.77	--
2 hr 30 min - 2 hr 44 min	1.54	4.05	--	0.19	0.39	--
2 hr 45 min - 2 hr 59 min	0.60	2.48	--	0.27	0.22	--
3 hr or more	0.96	4.29	1.23	0.92	0.75	--
Invalid*	0.26	0.68	1.23	0.65	0.35	1.35

* includes responses with no mark or multiple marks on start and/or stop time fields, making it impossible to compute the difference between start and stop times

Note: Includes all students who attempted the test using a regular form except home school students.

Table 2.4
Percentages of Students by Testing-Time Intervals in 2013–14 EOCEP Testing
(with Customized Forms)

	Algebra 1/Math Tech 2			Biology		
	Fall 2013 (N =6)	Spring 2014 (N =22)	Summer 2014 (N =0)	Fall 2013 (N =2)	Spring 2014 (N =36)	Summer 2014 (N =0)
Less than 15 min	--	--	--	--	--	--
15 min - 29 min	--	--	--	--	--	--
30 min - 44 min	--	4.55	--	--	--	--
45 min - 59 min	16.67	--	--	--	11.11	--
1 hr - 1 hr 14 min	--	13.64	--	--	30.56	--
1 hr 15 min - 1 hr 29 min	--	13.64	--	--	13.89	--
1 hr 30 min - 1 hr 44 min	--	18.18	--	--	8.33	--
1 hr 45 min - 1 hr 59 min	--	22.73	--	--	2.78	--
2 hr - 2 hr 14 min	66.67	--	--	100.00	16.67	--
2 hr 15 min - 2 hr 29 min	16.67	4.55	--	--	8.33	--
2 hr 30 min - 2 hr 44 min	--	4.55	--	--	--	--
2 hr 45 min - 2 hr 59 min	--	13.64	--	--	--	--
3 hr or more	--	4.55	--	--	5.56	--
Invalid*	--	--	--	--	2.78	--

	English 1			US History and Constitution		
	Fall 2013 (N =0)	Spring 2014 (N =30)	Summer 2014 (N =0)	Fall 2013 (N =2)	Spring 2014 (N =18)	Summer 2014 (N =0)
Less than 15 min	--	--	--	--	--	--
15 min - 29 min	--	--	--	--	--	--
30 min - 44 min	--	--	--	--	5.56	--
45 min - 59 min	--	3.33	--	--	5.56	--
1 hr - 1 hr 14 min	--	16.67	--	--	--	--
1 hr 15 min - 1 hr 29 min	--	33.33	--	50.00	--	--
1 hr 30 min - 1 hr 44 min	--	13.33	--	--	22.22	--
1 hr 45 min - 1 hr 59 min	--	13.33	--	--	--	--
2 hr - 2 hr 14 min	--	3.33	--	--	5.56	--
2 hr 15 min - 2 hr 29 min	--	6.67	--	--	11.11	--
2 hr 30 min - 2 hr 44 min	--	--	--	--	--	--
2 hr 45 min - 2 hr 59 min	--	--	--	50.00	5.56	--
3 hr or more	--	10.00	--	--	22.22	--
Invalid*	--	--	--	--	22.22	--

* includes responses with no mark or multiple marks on start and/or stop time fields, making it impossible to compute the difference between start and stop times

Note: Includes all students who attempted the test using a regular form except home school students.

2.4 STUDENT QUESTIONNAIRE

After the administration of the Biology EOCEP test during spring, students were instructed to complete a questionnaire that addressed such topics as the difficulty of the test, the nature of the instruction they had received, and the amount of time they had spent engaged in laboratory activities.

CHAPTER 3

TEST ADMINISTRATION

3.1 TEST ADMINISTRATION WINDOW

The test administration dates for the current year are given in Table 3, below. Within the state-approved testing window, districts selected a 10-day testing window for paper-pencil testing and a 15-day testing window for online testing. The SCDE recommends that districts administer the EOCEP tests over five consecutive days and use the additional days to complete make-up testing or to accommodate technological resources needed for online testing. Make-up testing was provided for students who missed the originally scheduled EOCEP test due to a death in the family, illness, or another situation deemed valid by the state. It was recommended that a single makeup test be given per day, but two could have been given per day if necessary. For all three EOCEP administrations, district test coordinators (DTCs) were responsible for providing the testing schedule to all school test coordinators (STCs) in their districts.

TABLE 3
2013–14 EOCEP Test Administration Windows

Administration	Dates
Fall 2013	December 3 – January 27
Spring 2014	May 1 – June 6
Summer 2014	June 23 – July 25

3.2 TIMING OF THE TEST

The EOCEP tests were not timed; however, each session had to be administered during a single day (unless a student's IEP or 504 Plan specifically stated that he or she needed to have the test administered over several days). To ensure an accurate assessment, districts and schools were instructed that students should be given as much time as they needed to complete the test.

3.3 ADMINISTRATION MANUALS

Working with the SCDE, DRC staff drafted the administration manuals for the test. SCDE staff reviewed and revised the manuals, and DRC finalized and printed them. The EOCEP district test coordinator supplements (SCDE 2013a, 2014a, and 2014c) were produced for each administration of the EOCEP. The DTC supplements included only the information that DTCs needed for the administration of the EOCEP tests. Test Administration Manuals (TAMs) (2013b and 2014b) were provided each fall and spring administration; the spring TAM is also used for reference each summer. These TAMs are for paper/pencil and online testing and were available

for download from both the SCDE and DRC. The TAMs contained the information that STCs, test administrators (TAs), and monitors needed to administer the tests to students in their schools. The TAMs and the supplements included logistical and administration procedures as well as the directions (scripts) for administering the tests. The DTCs, STCs, and TAs were encouraged to offer comments and suggestions on the procedures therein.

Appendix C in the TAMs includes a detailed description of customized materials available, as well as additional graphics for completing student demographic information and returning scorable and nonscorable test materials. Tables showing the types of customized materials available for students who require such special testing formats were also provided.

3.4 CUSTOMIZED MATERIALS

Customized formats of the EOCEP test were available in both paper-and-pencil and online versions for Algebra 1/Mathematics for the Technologies 2, Biology 1/Applied Biology 2, English 1, and United States History and the Constitution:

- Loose-leaf test booklets—printed single-sided, and bound in three-ring binders—allowed individuals to remove the pages, if necessary, during testing. Except for the English 1 test, this form contains only one item per page.
- Large-print booklets were produced for students who have difficulty reading text in a standard-size font. The large-print version used an 18-point sans serif font and was issued as a 9 x 12-inch spiral-bound booklet. The online testing system also accommodates students needing a large-print test, as it is fully scalable when a student uses a larger monitor.
- Form C Braille test booklets were produced for students who typically read classroom materials in braille. The braille version was issued as spiral-bound booklets containing 11½ x 11-inch interpoint braille pages. No braille accommodation was available via online testing.
- A regular print Form C test booklet was provided in test packets for students or TAs to use with customized formats such as the braille oral script, braille, and sign language versions. These booklets were saddle-stitched and printed in a 12-point font, just as the regular, noncustomized test booklets were.
- For students whose IEP or 504 Plan requires the oral administration of tests, oral administration scripts provided the directions to TAs regarding the appropriate way to read test questions, passages, and answer choices to the students.
- CD-ROMs were also produced to provide audio oral administration of the tests and contained recorded administration directions, passages, test questions, and the text-based answer choices. The CD-ROMs and the oral administration scripts contained the same information. Audio oral administration using Human Voice Audio (HVA) is also available in online test forms.
- Sign language DVDs included the signed test directions, questions, and most answer choices. Each DVD contains both American Sign Language (ASL) and Pidgin Signed English (PSE). For spring 2014, the sign language accommodation was also available for online testing.

3.5 MATERIALS SHIPPING AND RETURN

For all three administrations, test materials typically were shipped to district offices approximately two weeks before testing—in time for the DTCs to be able to distribute school materials at least one week before the schools’ test dates. Each school’s shipment was boxed individually and labeled with the total number of boxes shipped to that school. For the eight largest districts and the SC Public Charter School Districts, materials were shipped directly to schools.

The district office was also sent a shipment of noncustomized overage materials, which were to be used by the DTCs to complete any additional materials requests from the STCs. Materials in customized formats were sent only to the schools and only in the quantities ordered.

TAs were instructed to return their test materials to the STCs immediately after the test administration. The STCs then redistributed test materials to the TAs who needed them in order to administer makeup tests. Those TAs were instructed to return the makeup test materials to their STC immediately after the makeup session. DTCs were to arrange for the pickup of all scorable materials for return to DRC within three days after testing.

Because the test scores were required to be reported back to the schools within thirty-six hours for calculating final course grades, a rapid scoring and reporting process was utilized for all three administrations. Each school district could return the scorable materials to DRC in as many as five separate shipments. Nonscorable materials were to be returned in one shipment within three days of the completion of makeup tests. For all three administrations, step-by-step instructions for returning scorable and nonscorable materials were included in the TAM and DTC Supplement. These instructions listed the toll-free phone numbers of the shipping companies that the DTCs were instructed to call to schedule pickups of return materials

3.6 TEST SECURITY

Test security is an important issue before, during, and following test administrations. The specific procedures to be followed during the EOCEP test administrations are outlined in the *Test Administration Manual* (2013b and 2014b). The manual includes an excerpt from Section 59-1-445 of the South Carolina Code of Laws, a summary of Section 59-1-447 of the Code of Laws, and the entirety of State Board of Education Regulation 43-100.

Section 59-1-445 states in part:

It is unlawful for anyone knowingly and wilfully [*sic*] to violate security procedures regulations promulgated by the State Board of Education for mandatory tests administered by or through the State Board of Education to students or educators, or knowingly and wilfully to:

- (a) Give examinees access to test questions prior to testing;
- (b) Copy, reproduce, or use in any manner inconsistent with test security regulations all or any portion of any secure test booklet;
- (c) Coach examinees during testing or alter or interfere with examinees’ responses in any way;

- (d) Make answer keys available to examinees;
- (e) Fail to follow security regulations for distribution and return of secure test [materials] as directed, or fail to account for all secure test materials before, during, and after testing;
- (f) Participate in, direct, aid, counsel, assist in, encourage, or fail to report any of the acts prohibited in this section.

Regulation 43-100 mandates that “Each local school board must develop and adopt a district test security policy” with procedures for the storage and handling of all test materials and that each district superintendent must annually designate a DTC. The regulation and the *TAM* provide specific security guidelines regarding various aspects of the test administration process (e.g., the storage and handling of test materials, the responsibility of administrators to monitor students during testing and to remove supplemental materials from the testing room, and the requirement that administrators refrain from interference with student responses).

Following the test administration and the return of materials, DRC generated a missing-document report, listing the identification numbers of unreturned secure materials. The report was used to notify districts of missing materials. A toll-free telephone line was manned to answer questions regarding missing documents, and follow-up procedures were employed until all materials were accounted for. Subsequently, the districts located and returned the materials or sent signed statements indicating that all secure materials had been returned.

Secure Materials

Secure materials—each assigned a human- and machine-readable security identification number—are test booklets, answer documents, customized test materials, and administration scripts. Secure materials are locked in storage until the day of the test administration and are signed out when they are to be used, and signed in when they are returned. These materials are not to be left unattended at any time.

CHAPTER 4

TECHNICAL CHARACTERISTICS OF ITEMS

This chapter reports the results of item analyses based on classical test theory (CTT) using a proprietary program designed by DRC. Item difficulty (p) is the proportion (or percentage) of examinees correctly answering a dichotomously scored item.

Item discrimination is defined as a correlation between the item score and the total score. For the discrimination index, point-biserial correlations were produced. In computing the point-biserial correlation, DRC corrected for spuriousness. In the recoding of missing data for item analysis, all omitted and not-reached items were recoded as incorrect, with a zero score. After discussions between the SCDE and DRC, it was decided to exclude from the CTT item analyses and item calibrations those students who had used customized test materials.

4.1 ITEM NONRESPONSE RATES

Although the EOCEP tests were not timed, students were required to finish each test during one school day, unless they had an IEP that allowed for accommodations in administration. Districts and schools were instructed that, if they had space and staff available, students should be given as much time as necessary to take the test to ensure an accurate assessment.

The item nonresponse rates indicate the percentage of students who did not reach a particular item and all items thereafter. The item omit rates indicate the percentage of students who did not respond to that particular item but did respond to a later item. The percentages for not-reached and omit rates were quite low—less than 1 percent—in all subjects. These data indicate that students were given ample time to complete the test in every subject.

4.2 CLASSICAL ITEM STATISTICS

Table 4 provides a summary of item p -values and item discrimination values for operational items for all three administrations.

Table 4
Summary of Classical Item Statistics

Administration	Number of items	Mean p-value	Adjusted Point-Biserial Correlation
Algebra 1/Math Tech 2			
Fall 2013	50	0.594	0.324
Spring 2014	50	0.613	0.366
Summer 2014	50	0.495	0.203
Biology			
Fall 2013	60	0.623	0.341
Spring 2014	60	0.611	0.368
Summer 2014	60	0.540	0.319
English 1			
Fall 2013	55	0.649	0.318
Spring 2014	55	0.704	0.357
Summer 2014	55	0.618	0.318
US History and Constitution			
Fall 2013	55	0.543	0.312
Spring 2014	56	0.632	0.374
Summer 2014	55	0.481	0.254

Note: Includes all students who attempted the test using a complete regular form except home school students and students in an adult education program.

CHAPTER 5

ITEM CALIBRATION AND SCALING

5.1 METHODOLOGY AND SOFTWARE

The one-parameter Rasch model (Rasch 1960; Wright and Stone 1979) was used to calibrate all items, using WINSTEPS software (see Linacre and Wright 2003). The WINSTEPS program employs joint maximum likelihood estimation, an approach that estimates the item and person parameters simultaneously.

5.2 ITEM CALIBRATION AND PRE-EQUATING

The AIR conducted field tests with a sufficient number of items to create precalibrated item pools and to construct pre-equated operational-test forms for all tests. For all subjects, the Rasch-ability-score-to-scale-score conversion tables were produced prior to each test administration based on the item parameters in the pre-equated item pools. If an item or items on a test form had to be replaced, SCDE staff recalibrated the forms, producing new conversion tables.

5.3 SCALING

The SCDE provided DRC with initial Rasch-ability-score-to-scale-score conversion tables that showed the transformation of the ability score interval for each scale score for each subject area. DRC then applied these tables specifically to each test form for each subject area on the basis of the pre-equated item pool. The conversion tables took into account any differences in the difficulty of the various forms. All items shared a common metric so that the scale scores developed for each form were automatically adjusted for differences in item difficulty. For all EOCEP test subjects, the scale scores are now reported according to the South Carolina UGS. Scale scores range from 0 to 100 with a minimum passing score of 70. Each scale score is assigned a letter-grade equivalent (A, B, C, D, or F) in accordance with the UGS.

5.4 DEFINITION OF SCOREABILITY

A student was considered “tested” if the student answered at least one question on the answer document or by means of the online testing system. All tested students’ item responses were scored. All omits and not-reached items were recoded as incorrect, with a zero score.

5.5 REPORTING OF ZERO AND PERFECT SCORES

In item response theory (IRT), zero and perfect scores are assigned the ability of minus and plus infinity. The AIR used the WINSTEPS default setting in estimating finite values for the extreme scores. In other words, a fractional score point value was subtracted from perfect scores, and was added to zero scores. The WINSTEPS default value for adjusting the extreme scores for extreme measures is 0.3. This value was also used by SCDE staff when recalibrating forms.

5.6 PERCENTAGE OF STUDENTS SCORING IN EACH LETTER-GRADE EQUIVALENT

Tables 5.1 through 5.8 report student performance for all administrations combined. The results are summarized separately for public middle and high schools and for adult education programs. The number and percentage of students in each letter-grade equivalent and the mean scale score are reported for the test-takers overall and by demographic category.

Table 5.1
Algebra 1/Math Tech 2 Operational Test, Grades 6-12:
Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics

Demographics	N	Mean Scale Score	A	B	C	D	F
Overall	58,630	82.12	23.07	16.31	26.02	20.21	14.39
Gender							
Female	28,790	82.59	23.55	16.91	27.00	19.89	12.65
Male	29,557	81.73	22.76	15.80	25.15	20.40	15.88
Unknown	283	73.91	6.71	8.13	17.67	31.80	35.69
Grade							
6	31	97.90	90.32	3.23	6.45	--	--
7	2,960	95.06	72.57	15.20	8.61	2.97	0.64
8	14,571	90.42	48.46	22.73	20.27	6.54	2.00
9	31,255	79.41	12.53	15.98	30.47	24.25	16.77
10	8,804	74.44	3.53	8.30	25.85	33.23	29.08
11	598	74.36	5.02	6.86	26.42	29.10	32.61
12	201	77.44	9.95	10.95	27.86	29.85	21.39
Other	210	72.23	4.76	4.76	16.19	32.38	41.90
Ethnicity							
Hispanic or Latino	3,497	81.61	20.30	16.10	28.80	20.99	13.81
American Indian or Alaska Native	176	80.97	17.61	17.05	27.27	23.86	14.20
Asian	818	91.50	56.97	17.11	14.79	8.68	2.44
Black or African American	19,479	77.12	9.32	11.97	27.51	27.77	23.44
Native Hawaiian or Other Pacific Islander	69	83.87	31.88	15.94	18.84	20.29	13.04
White	32,342	85.06	30.95	19.10	25.27	15.81	8.88
Two or More Races	1,485	83.95	28.22	17.17	25.79	17.17	11.65
Other	764	73.78	6.94	6.81	20.42	27.62	38.22
Language							
Parent waiver	29	79.34	13.79	10.34	31.03	31.03	13.79
Pre-functional	180	71.80	8.33	4.44	15.56	20.56	51.11
Beginner	205	73.96	8.78	6.34	16.10	32.68	36.10
Intermediate	446	76.18	6.28	11.21	25.11	33.18	24.22
Advanced	1,458	82.94	21.12	19.14	30.93	20.64	8.16
Initially English Proficient	12	84.67	16.67	33.33	33.33	8.33	8.33
Title III First Year Exited	171	87.36	36.26	20.47	26.90	11.70	4.68
Title III Second + Year Exited	145	92.38	61.38	13.79	20.00	2.76	2.07
English Speaker I	547	89.64	48.08	16.82	22.67	8.59	3.84
English Speaker II	54,191	82.25	23.29	16.51	26.12	20.09	13.99
Other	1,246	75.07	9.07	8.91	21.59	26.24	34.19

Table 5.1
Algebra 1/Math Tech 2 Operational Test, Grades 6-12:
Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics

Demographics	N	Mean Scale Score	A	B	C	D	F
Lunch							
Free meals	26,275	78.17	11.63	13.22	28.02	26.11	21.01
Reduced-price meals	3,902	81.65	18.50	17.99	29.16	21.50	12.84
No free/reduced-price meals	28,453	85.83	34.25	18.92	23.75	14.58	8.49
IEP							
Yes	5,399	72.49	3.87	6.37	19.23	30.89	39.64
No	53,231	83.09	25.02	17.31	26.71	19.12	11.83
Migrant							
Yes	12	81.08	16.67	--	50.00	33.33	--
No	58,618	82.12	23.07	16.31	26.02	20.21	14.40
Courses taken							
4111 (Alg 1)	43,726	83.74	27.14	18.21	26.07	17.15	11.43
3142 (Math for the Techs 2)	10,359	74.54	3.23	8.24	26.80	33.91	27.81
4114 (Common Core Alg 1)	4,541	83.80	29.13	16.34	23.87	18.39	12.27
Other	4	--	--	--	--	--	--
Gifted/talented							
Academic	10,281	93.12	61.50	19.85	14.21	3.69	0.75
Artistic	1,235	84.70	25.18	21.94	31.17	16.19	5.51
Both	1,401	95.09	72.52	15.77	8.78	2.43	0.50
No	45,713	79.17	12.85	15.37	29.07	24.58	18.13
504 Plan							
Yes	1,155	81.06	18.87	16.10	26.67	23.98	14.37
No	57,475	82.14	23.15	16.31	26.01	20.13	14.39
Accommodations							
Yes	1,049	72.44	4.48	5.34	20.31	29.55	40.32
No	57,581	82.29	23.41	16.51	26.13	20.04	13.92

Note: Includes all students who attempted the test except home school students and students in an adult education program.
If the number tested is less than 10, no other statistics appear.

Table 5.2
Algebra 1/Math Tech 2 Operational Test, Adult Education Programs:
Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics

Demographics	<i>N</i>	Mean Scale Score	A	B	C	D	F
Overall	33	67.82	--	3.03	12.12	21.21	63.64
Gender							
Female	12	70.00	--	--	8.33	41.67	50.00
Male	13	70.31	--	7.69	23.08	7.69	61.54
Unknown	8	--	--	--	--	--	--
Ethnicity							
Black or African American	5	--	--	--	--	--	--
White	2	--	--	--	--	--	--
Other	26	68.35	--	3.85	15.38	19.23	61.54
Language							
Other	33	67.82	--	3.03	12.12	21.21	63.64
Lunch							
Free meals	1	--	--	--	--	--	--
No free/reduced-price meals	32	68.00	--	3.13	12.50	21.88	62.50
IEP							
No	33	67.82	--	3.03	12.12	21.21	63.64
Migrant							
No	33	67.82	--	3.03	12.12	21.21	63.64
Courses taken							
4111 (Alg 1)	29	67.34	--	--	13.79	20.69	65.52
3142 (Math for the Techs 2)	3	--	--	--	--	--	--
Other	1	--	--	--	--	--	--
Gifted/talented							
No	33	67.82	--	3.03	12.12	21.21	63.64
504 Plan							
No	33	67.82	--	3.03	12.12	21.21	63.64
Accommodations							
No	33	67.82	--	3.03	12.12	21.21	63.64

Note: Includes all students who attempted the test and are in an adult education program except home school students.
If the number tested is less than 10, no other statistics appear.

Table 5.3
Biology Operational Test, Grades 6-12:
Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics

Demographics	N	Mean Scale Score	A	B	C	D	F
Overall	53,431	81.86	30.33	14.84	17.60	16.01	21.21
Gender							
Female	26,470	81.96	29.30	15.23	18.60	16.90	19.97
Male	26,696	81.90	31.59	14.49	16.71	15.15	22.06
Unknown	265	68.16	7.17	11.70	6.79	14.34	60.00
Grade							
8	35	78.31	8.57	20.00	25.71	25.71	20.00
9	21,005	82.88	34.14	15.14	16.45	14.04	20.22
10	30,268	81.68	28.91	14.87	18.40	17.16	20.66
11	1,349	75.63	14.83	11.64	18.46	19.27	35.80
12	514	74.61	12.26	10.31	20.23	20.43	36.77
Other	260	68.35	7.31	12.31	6.92	14.62	58.85
Ethnicity							
Hispanic or Latino	3,082	79.53	22.91	15.02	19.50	17.85	24.72
American Indian or Alaska Native	174	80.06	26.44	12.64	18.97	16.67	25.29
Asian	767	89.43	56.98	13.43	12.78	6.65	10.17
Black or African American	18,078	75.07	12.47	11.64	18.49	22.09	35.30
Native Hawaiian or Other Pacific Islander	90	85.24	36.67	18.89	14.44	14.44	15.56
White	29,464	86.25	41.66	16.89	17.10	12.39	11.96
Two or More Races	1,126	82.57	31.88	15.45	17.76	14.92	19.98
Other	650	72.51	14.62	10.77	12.00	15.54	47.08
Language							
Parent waiver	23	77.52	17.39	13.04	21.74	17.39	30.43
Pre-functional	157	60.84	1.27	1.91	3.82	8.28	84.71
Beginner	183	65.21	2.19	1.64	13.66	15.30	67.21
Intermediate	421	69.46	4.04	5.23	14.96	22.33	53.44
Advanced	1,040	79.94	19.62	14.81	24.62	21.92	19.04
Initially English Proficient	18	86.50	38.89	16.67	16.67	16.67	11.11
Title III First Year Exited	249	87.80	38.96	23.69	20.88	11.24	5.22
Title III Second + Year Exited	103	89.46	44.66	25.24	18.45	9.71	1.94
English Speaker I	583	89.31	50.77	17.84	15.95	8.58	6.86
English Speaker II	49,660	82.19	30.97	15.03	17.65	15.98	20.37
Other	994	72.53	14.89	9.26	11.47	16.50	47.89
Lunch							
Free meals	23,186	76.29	15.25	12.55	18.96	20.79	32.44
Reduced-price meals	3,475	80.95	24.60	16.49	20.63	17.47	20.81
No free/reduced-price meals	26,770	86.81	44.14	16.62	16.02	11.68	11.54
IEP							
Yes	5,132	68.41	6.27	5.88	11.61	18.22	58.01
No	48,299	83.29	32.89	15.80	18.23	15.78	17.30
Migrant							
Yes	11	74.09	18.18	9.09	--	36.36	36.36
No	53,420	81.86	30.34	14.84	17.60	16.01	21.21
Courses taken							
3221 (Biology 1)	50,754	82.38	31.55	15.17	17.69	15.57	20.02
3227 (Applied Biology 2)	2,641	71.62	6.10	8.67	16.02	24.80	44.41

Table 5.3
Biology Operational Test, Grades 6-12:
Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics

Demographics	N	Mean Scale Score	A	B	C	D	F
Other	36	97.39	88.89	5.56	2.78	--	2.78
Gifted/talented							
Academic	7,098	95.08	73.44	15.41	7.93	2.55	0.66
Artistic	1,000	86.72	42.10	15.70	19.10	14.10	9.00
Both	597	95.94	79.06	11.89	6.37	1.84	0.84
No	44,736	79.47	22.58	14.77	19.25	18.38	25.02
504 Plan							
Yes	1,090	82.07	31.10	14.50	16.97	16.61	20.83
No	52,341	81.86	30.32	14.85	17.61	16.00	21.22
Accommodations							
Yes	1,078	67.36	7.33	4.82	11.41	13.91	62.52
No	52,353	82.16	30.81	15.05	17.73	16.06	20.36

Note: Includes all students who attempted the test except home school students and students in an adult education program.

Table 5.4
Biology Operational Test, Adult Education Programs:
Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics

Demographics	<i>N</i>	Mean Scale Score	A	B	C	D	F
Overall	34	67.68	2.94	5.88	14.71	17.65	58.82
Gender							
Female	15	64.73	--	--	13.33	20.00	66.67
Male	9	--	--	--	--	--	--
Unkown	10	67.00	--	10.00	--	30.00	60.00
Ethnicity							
Hispanic or Latino	1	--	--	--	--	--	--
Black or African American	5	--	--	--	--	--	--
White	1	--	--	--	--	--	--
Other	27	69.63	3.70	7.41	18.52	14.81	55.56
Language							
Other	34	67.68	2.94	5.88	14.71	17.65	58.82
Lunch							
No free/reduced-price meals	34	67.68	2.94	5.88	14.71	17.65	58.82
IEP							
No	34	67.68	2.94	5.88	14.71	17.65	58.82
Migrant							
No	34	67.68	2.94	5.88	14.71	17.65	58.82
Courses taken							
3221 (Biology 1)	29	67.90	3.45	6.90	10.34	20.69	58.62
3227 (Applied Biology 2)	5	--	--	--	--	--	--
Gifted/talented							
No	34	67.68	2.94	5.88	14.71	17.65	58.82
504 Plan							
No	34	67.68	2.94	5.88	14.71	17.65	58.82
Accommodations							
No	34	67.68	2.94	5.88	14.71	17.65	58.82

Note: Includes all students who attempted the test and are in an adult education program except home school students.
If the number tested is less than 10, no other statistics appear.

Table 5.5
English 1 Operational Test, Grades 6-12:
Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics

Demographics	N	Mean Scale Score	A	B	C	D	F
Overall	56,240	78.41	13.41	19.22	26.11	18.31	22.96
Gender							
Female	27,576	79.64	15.16	20.55	26.82	18.08	19.39
Male	28,327	77.30	11.78	18.01	25.49	18.53	26.18
Unknown	337	71.70	6.53	12.17	20.18	17.51	43.62
Grade							
7	4	--	--	--	--	--	--
8	12,162	87.21	30.43	34.07	26.20	7.10	2.20
9	43,133	76.14	8.81	15.28	26.34	21.45	28.13
10	538	68.54	2.60	8.36	13.20	19.89	55.95
11	101	70.13	7.92	7.92	17.82	14.85	51.49
12	54	75.81	16.67	11.11	22.22	16.67	33.33
Other	248	67.78	3.23	6.45	13.71	20.56	56.05
Ethnicity							
Hispanic or Latino	3,348	76.33	9.44	16.31	26.73	20.07	27.45
American Indian or Alaska Native	165	77.22	11.52	17.58	24.85	19.39	26.67
Asian	775	83.91	28.39	24.00	25.16	10.71	11.74
Black or African American	18,779	73.01	4.32	10.63	23.66	23.85	37.53
Native Hawaiian or Other Pacific Islander	66	80.55	18.18	24.24	27.27	10.61	19.70
White	30,908	81.85	19.10	24.56	27.61	15.07	13.66
Two or More Races	1,460	80.00	14.32	23.77	28.15	15.48	18.29
Other	739	72.50	6.63	13.40	19.89	18.67	41.41
Language							
Parent waiver	14	73.93	--	21.43	28.57	21.43	28.57
Pre-functional	182	55.52	--	1.65	2.20	4.95	91.21
Beginner	221	62.02	0.45	0.45	4.52	10.86	83.71
Intermediate	431	68.58	1.16	4.18	11.37	28.31	54.99
Advanced	1,460	77.57	5.62	16.44	33.22	26.58	18.15
Initially English Proficient	6	--	--	--	--	--	--
Title III First Year Exited	149	83.87	16.78	32.89	34.90	10.74	4.70
Title III Second + Year Exited	98	87.11	33.67	28.57	27.55	9.18	1.02
English Speaker I	532	86.45	30.08	31.02	27.44	6.95	4.51
English Speaker II	51,881	78.71	13.78	19.58	26.27	18.20	22.17
Other	1,266	72.24	6.32	11.53	21.72	19.51	40.92
Lunch							
Free meals	25,819	74.09	5.61	12.77	24.77	22.53	34.32
Reduced-price meals	3,793	78.16	10.39	19.25	28.26	20.75	21.36
No free/reduced-price meals	26,628	82.64	21.40	25.48	27.10	13.87	12.16
IEP							
Yes	5,520	67.08	1.63	4.57	13.10	19.84	60.87
No	50,720	79.65	14.69	20.82	27.53	18.14	18.83
Migrant							
Yes	12	78.00	--	25.00	33.33	25.00	16.67
No	56,228	78.41	13.41	19.22	26.11	18.31	22.96
Courses taken							
3011 (Eng 1)	52,583	78.41	13.34	19.17	26.16	18.43	22.90
3024 (Common Core Eng 1)	3,639	78.51	14.37	20.03	25.36	16.65	23.58

Table 5.5
English 1 Operational Test, Grades 6-12:
Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics

Demographics	<i>N</i>	Mean Scale Score	A	B	C	D	F
Other	18	65.44	11.11	5.56	16.67	5.56	61.11
Gifted/talented							
Academic	9,053	89.40	39.71	35.66	20.16	3.59	0.88
Artistic	1,238	82.25	15.83	24.47	35.30	15.67	8.72
Both	1,217	91.79	53.41	32.13	12.49	1.48	0.49
No	44,732	75.72	6.93	15.40	27.43	21.82	28.43
504 Plan							
Yes	1,209	77.05	10.75	16.46	28.12	19.69	24.98
No	55,031	78.44	13.47	19.28	26.07	18.28	22.91
Accommodations							
Yes	1,160	66.22	1.55	3.62	12.59	18.45	63.79
No	55,080	78.67	13.66	19.55	26.39	18.30	22.10

Note: Includes all students who attempted the test except home school students and students in an adult education program.
If the number tested is less than 10, no other statistics appear.

Table 5.6
English 1 Operational Test, Adult Education Programs:
Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics

Demographics	<i>N</i>	Mean Scale Score	A	B	C	D	F
Overall	18	73.39	11.11	11.11	16.67	11.11	50.00
Gender							
Female	6	--	--	--	--	--	--
Male	11	70.82	9.09	--	18.18	18.18	54.55
Unknown	1	--	--	--	--	--	--
Ethnicity							
Black or African American	2	--	--	--	--	--	--
Other	16	73.19	12.50	12.50	12.50	12.50	50.00
Language							
Other	18	73.39	11.11	11.11	16.67	11.11	50.00
Lunch							
No free/reduced-price meals	18	73.39	11.11	11.11	16.67	11.11	50.00
IEP							
No	18	73.39	11.11	11.11	16.67	11.11	50.00
Migrant							
No	18	73.39	11.11	11.11	16.67	11.11	50.00
Courses taken							
3011 (Eng 1)	18	73.39	11.11	11.11	16.67	11.11	50.00
Gifted/talented							
No	18	73.39	11.11	11.11	16.67	11.11	50.00
504 Plan							
No	18	73.39	11.11	11.11	16.67	11.11	50.00
Accommodations							
No	18	73.39	11.11	11.11	16.67	11.11	50.00

Note: Includes all students who attempted the test and are in an adult education program except home school students.
If the number tested is less than 10, no other statistics appear.

Table 5.7
US History and Constitution Operational Test, Grades 6-12:
Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics

Demographics	N	Mean Scale Score	A	B	C	D	F
Overall	47,669	74.92	8.43	13.05	22.78	21.13	34.61
Gender							
Female	23,928	73.95	7.18	11.53	21.83	21.38	38.06
Male	23,403	75.91	9.63	14.60	23.75	20.95	31.06
Unknown	338	75.37	13.31	12.72	22.78	15.68	35.50
Grade							
8	1	--	--	--	--	--	--
9	571	66.21	2.63	5.43	8.93	15.06	67.95
10	5,679	70.61	4.98	8.06	16.62	19.25	51.08
11	38,497	75.80	9.09	14.05	24.04	21.62	31.20
12	2,654	73.39	6.93	10.93	21.29	20.01	40.84
Other	267	74.20	13.48	11.61	17.23	15.36	42.32
Ethnicity							
Hispanic or Latino	2,500	73.54	5.44	11.12	23.88	22.16	37.40
American Indian or Alaska Native	126	75.78	9.52	15.08	22.22	19.05	34.13
Asian	744	80.05	20.30	17.34	23.66	16.94	21.77
Black or African American	16,249	69.66	2.36	6.39	16.15	21.95	53.14
Native Hawaiian or Other Pacific Islander	58	75.48	5.17	17.24	24.14	17.24	36.21
White	26,186	78.12	12.03	17.15	26.65	20.84	23.33
Two or More Races	1,021	76.25	9.40	14.89	25.76	20.96	28.99
Other	785	74.69	10.70	12.99	22.68	15.67	37.96
Language							
Parent waiver	25	69.96	4.00	--	28.00	12.00	56.00
Pre-functional	85	58.58	--	--	4.71	5.88	89.41
Beginner	148	62.22	0.68	--	4.05	10.81	84.46
Intermediate	296	65.92	0.34	3.72	9.46	15.88	70.61
Advanced	697	71.27	0.86	5.45	22.53	27.69	43.47
Initially English Proficient	13	74.85	7.69	15.38	7.69	38.46	30.77
Title III First Year Exited	297	77.24	9.43	13.13	30.64	24.24	22.56
Title III Second + Year Exited	272	79.85	16.18	16.54	27.21	24.26	15.81
English Speaker I	470	80.35	14.04	22.77	26.60	21.06	15.53
English Speaker II	44,129	74.99	8.41	13.16	22.87	21.24	34.32
Other	1,237	75.71	12.77	13.82	22.31	15.68	35.41
Lunch							
Free meals	19,028	70.35	2.75	7.21	17.85	22.18	50.02
Reduced-price meals	3,016	73.81	5.84	11.01	22.61	24.27	36.27
No free/reduced-price meals	25,625	78.44	12.95	17.63	26.47	19.99	22.97
IEP							
Yes	3,858	66.16	1.35	3.73	10.68	17.26	66.98
No	43,811	75.69	9.05	13.87	23.85	21.47	31.76
Migrant							
Yes	10	68.10	--	10.00	10.00	20.00	60.00
No	47,659	74.92	8.43	13.05	22.78	21.13	34.60
Courses taken							
3320 (US Hst of Const. or College Prep US Hst)	42,085	73.24	4.65	11.05	22.80	22.85	38.65
3372 (AP US Hst)	5,114	87.99	38.27	28.45	21.78	7.74	3.75
336D (IB Hst of Americas)	273	85.61	25.64	31.50	28.57	9.16	5.13

Table 5.7
US History and Constitution Operational Test, Grades 6-12:
Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics

Demographics	<i>N</i>	Mean Scale Score	A	B	C	D	F
Other	197	80.38	16.24	13.71	37.06	19.29	13.71
Gifted/talented							
Academic	4,081	84.74	23.18	28.64	29.97	13.18	5.02
Artistic	1,233	78.81	13.71	16.22	29.28	19.71	21.09
Both	354	86.00	27.12	29.10	28.53	12.15	3.11
No	42,001	73.76	6.68	11.30	21.84	22.02	38.15
504 Plan							
Yes	993	75.54	9.57	12.69	22.66	22.46	32.63
No	46,676	74.91	8.40	13.06	22.78	21.11	34.65
Accommodations							
Yes	804	66.66	1.87	4.10	11.82	14.93	67.29
No	46,865	75.06	8.54	13.20	22.97	21.24	34.05

Note: Includes all students who attempted the test except home school students and students in an adult education program.
If the number tested is less than 10, no other statistics appear.

Table 5.8
US History and Constitution Operational Test, Adult Education Programs:
Percentages of Student Scores in Letter-Grade Equivalents, Overall and by Demographics

Demographics	<i>N</i>	Mean Scale Score	A	B	C	D	F
Overall	83	64.41	--	--	10.84	14.46	74.70
Gender							
Female	27	64.85	--	--	11.11	14.81	74.07
Male	40	64.88	--	--	15.00	15.00	70.00
Unknown	16	62.50	--	--	--	12.50	87.50
Ethnicity							
Hispanic or Latino	2	--	--	--	--	--	--
Black or African American	10	61.40	--	--	10.00	10.00	80.00
White	8	--	--	--	--	--	--
Other	63	65.52	--	--	12.70	17.46	69.84
Language							
English Speaker II	2	--	--	--	--	--	--
Other	81	64.32	--	--	9.88	14.81	75.31
Lunch							
Free meals	5	--	--	--	--	--	--
No free/reduced-price meals	78	64.59	--	--	11.54	15.38	73.08
IEP							
No	83	64.41	--	--	10.84	14.46	74.70
Migrant							
No	83	64.41	--	--	10.84	14.46	74.70
Courses taken							
3320 (US Hst of Const. or College Prep US Hst)	83	64.41	--	--	10.84	14.46	74.70
Gifted/talented							
No	83	64.41	--	--	10.84	14.46	74.70
504 Plan							
No	83	64.41	--	--	10.84	14.46	74.70
Accommodations							
No	83	64.41	--	--	10.84	14.46	74.70

Note: Includes all students who attempted the test and are in an adult education program except home school students.
If the number tested is less than 10, no other statistics appear.

CHAPTER 6

DESCRIPTIVE STATISTICS

Descriptive statistics of scale score distributions for the three test administrations of the current year combined are presented in table 6 for students overall and by gender and race.

TABLE 6
2013–14 EOCEP Test Administration Summary Statistics: Grades 6-12 and Adult
Education Programs, Overall and by Gender, Race, and Accommodations

Algebra 1/Math Tech 2							
Grades 6-12				Adult Education Programs			
	<i>N</i>	Scale Score			<i>N</i>	Scale Score	
		Mean	<i>SD</i>			Mean	<i>SD</i>
Overall	58,630	82.12	11.57	Overall	33	67.82	8.60
Gender				Gender			
Female	28,790	82.59	11.32	Female	12	70.00	6.44
Male	29,557	81.73	11.79	Male	13	70.31	8.84
Ethnicity				Ethnicity			
African-American	19,479	77.12	10.27	African-American	5	64.80	5.40
White	32,342	85.06	11.23	White	2	68.50	9.19
Accommodations				Accommodations			
No	57,581	82.29	11.53	No	33	67.82	8.60
Yes	1,049	72.44	9.60	Yes	0	--	--

Biology							
Grades 6-12				Adult Education Programs			
	<i>N</i>	Scale Score			<i>N</i>	Scale Score	
		Mean	<i>SD</i>			Mean	<i>SD</i>
Overall	53,431	81.86	14.21	Overall	34	67.68	12.17
Gender				Gender			
Female	26,470	81.96	13.71	Female	15	64.73	9.29
Male	26,696	81.90	14.62	Male	9	73.33	15.96
Ethnicity				Ethnicity			
African-American	18,078	75.07	13.15	African-American	5	57.60	8.56
White	29,464	86.25	12.98	White	1	70.00	0.00
Accommodations				Accommodations			
No	52,353	82.16	14.06	No	34	67.68	12.17
Yes	1,078	67.36	13.68	Yes	0	--	--

TABLE 6
2013–14 EOCEP Test Administration Summary Statistics: Grades 6-12 and Adult
Education Programs, Overall and by Gender, Race, and Accommodations

English 1							
Grades 6-12				Adult Education Programs			
	<i>N</i>	Scale Score			<i>N</i>	Scale Score	
		Mean	SD			Mean	SD
Overall	56,240	78.41	11.87	Overall	18	73.39	13.12
Gender				Gender			
Female	27,576	79.64	11.43	Female	6	80.17	14.46
Male	28,327	77.30	12.13	Male	11	70.82	11.75
Ethnicity				Ethnicity			
African-American	18,779	73.01	10.94	African-American	2	75.00	8.49
White	30,908	81.85	11.03	White	0	--	--
Accommodations				Accommodations			
No	55,080	78.67	11.76	No	18	73.39	13.12
Yes	1,160	66.22	10.75	Yes	0	--	--

US History and Constitution							
Grades 6-12				Adult Education Programs			
	<i>N</i>	Scale Score			<i>N</i>	Scale Score	
		Mean	SD			Mean	SD
Overall	47,669	74.92	11.57	Overall	83	64.41	8.93
Gender				Gender			
Female	23,928	73.95	11.37	Female	27	64.85	9.16
Male	23,403	75.91	11.66	Male	40	64.88	9.78
Ethnicity				Ethnicity			
African-American	16,249	69.66	10.18	African-American	10	61.40	9.57
White	26,186	78.12	11.14	White	8	61.38	7.03
Accommodations				Accommodations			
No	46,865	75.06	11.54	No	83	64.41	8.93
Yes	804	66.66	10.21	Yes	0	--	--

Note: Includes all students who attempted the test except home school students.

CHAPTER 7

RELIABILITY

In this chapter, multiple types of reliability indexes are presented. For the total tests, two measures of the reliability of raw scores and the classical standard error of measurement (SEM) are given. At the passing cut scores, conditional standard errors of measurement (CSEM) for raw scores, for scale scores, and measures of decision consistency were determined.

7.1 RELIABILITY OF RAW SCORES

Table 7.1 reports the reliability coefficients and SEMs. The reliabilities of the total raw scores were computed using the Kuder-Richardson formulas 20 (KR20) and 21 (KR21). The KR21 reliability coefficients were used in computing the CSEM for the raw scores shown below, in section 7.2.

Table 7.1
Reliability Coefficients of Raw Scores

Administration	Number of Items	Number of Test Takers	KR-20	KR-21	Classical SEM
Algebra 1/Mathematics for the Technologies 2					
Fall 2013	50	7,728	0.869	0.853	4.032
Spring 2014	50	50,692	0.888	0.876	3.876
Summer 2014	50	182	0.765	0.727	4.154
Biology					
Fall 2013	60	12,987	0.899	0.890	4.440
Spring 2014	60	40,347	0.911	0.902	4.275
Summer 2014	60	59	0.877	0.861	4.685
English 1					
Fall 2013	55	7,262	0.868	0.845	3.886
Spring 2014	55	48,867	0.889	0.875	3.995
Summer 2014	55	81	0.876	0.857	4.159
US History and Constitution					
Fall 2013	55	10,288	0.849	0.833	3.545
Spring 2014	56	37,296	0.909	0.902	3.621
Summer 2014	55	65	0.805	0.784	3.560

Note: Includes all students who attempted the test using a complete regular form except home school students and students in an adult education program.

7.2 OVERALL AND CONDITIONAL SEM

The overall classical SEM is defined as $s_x\sqrt{1-r_{xx}}$, where s_x is the standard deviation of the scale score and r_{xx} is the reliability coefficient. The CSEM for raw scores at the cut score was computed using the following formula (Feldt and Qualls 1998; Huynh, Meyer, and Barton 2000):

$$\text{raw score CSEM} = \sqrt{\left(\frac{1-KR20}{1-KR21}\right)\left(\frac{c(k-c)}{k-1}\right)}, \text{ where } c = \text{cut score and } k = \text{number of items.}$$

The scale score CSEM at the passing cut score was computed on the basis of the conditional standard error of the Rasch ability cut score. The scale score CSEM is defined as the reciprocal of the square root of the test information function at the point on the ability continuum that corresponds to the scale score cut (Hambleton, Swaminathan, and Rogers 1991). Although classical and conditional SEMs serve similar roles, the values of the conditional standard errors are determined separately for each possible test score, while the classical SEM is a single value used for all scores. Table 7.2 presents both the raw score and scale score CSEMs.

TABLE 7.2
2013–14 EOCEP Conditional Standard Errors of Measurement

Administration	Raw Scores	Scale Scores
Algebra/ Mathematics for the Technologies 2		
Fall 2013	3.348	4.349
Spring 2014	3.318	4.367
Summer 2014	3.287	4.269
Biology		
Fall 2013	3.745	4.426
Spring 2014	3.691	4.392
Summer 2014	3.657	4.334
English 1		
Fall 2013	3.448	4.262
Spring 2014	3.478	4.339
Summer 2014	3.438	4.289
US History and Constitution		
Fall 2013	3.558	4.380
Spring 2014	3.625	4.433
Summer 2014	3.554	4.375

Note: Includes all students who attempted the test using a complete regular form except home school students and students in an adult education program.

7.3 CONSISTENCY OF PASSING CUT SCORES

When student performance is reported in a pass or fail category, a reliability index is computed in terms of the probabilities of consistent classification of students, as specified in standard 2.15 in *Standards for Educational and Psychological Testing* (AERA, APA, and NCME 1999). This index takes into consideration the consistency of classifications for the percentage of examinees who would be classified in the same way on a second (hypothetical) EOCEP administration using either the same form or an alternate equivalent form.

Although a number of procedures are available for estimating classification errors (Livingston and Lewis 1995; Hanson and Brennan 1990; Huynh 1976; Subkoviak 1976), DRC used the *beta* binomial distribution method (Huynh 1979; Huynh, Meyer, and Barton 2000). Table 7.3 presents a summary of agreements between the operational test classifications—that is, the percentages of students who would be consistently classified in the same category (pass or fail) on two equivalent administrations of the test. The consistency index for the passing score is computed for each administration.

TABLE 7.3
2013–14 EOCEP Consistency Index for Passing Scores

Administration	Consistency Index
Algebra/ Mathematics for the Technologies 2	
Fall 2013	88.213
Spring 2014	91.575
Summer 2014	77.520
Biology	
Fall 2013	89.507
Spring 2014	90.278
Summer 2014	85.941
English 1	
Fall 2013	86.191
Spring 2014	88.505
Summer 2014	83.591
US History and Constitution	
Fall 2013	82.070
Spring 2014	87.970
Summer 2014	79.231

Note: Includes all students who attempted the test using a complete regular form except home school students and students in an adult education program.

CHAPTER 8

VALIDITY

Three types of validity evidence are reported for the algebra test forms: test content, item fairness, and internal structure. Evidence of content validity is presented in the item content distribution across domains and the alignment of the current year's EOCEP test items with the state content standards. Evidence of item fairness is examined with the information on differential item functioning (DIF). Evidence of internal structure is provided in correlations among content domains.

8.1 ITEM DISTRIBUTION ACROSS CONTENT DOMAINS

The EOCEP operational and implementation test forms were constructed according to the test specifications and the test blueprints. These items measured the specific assessment standards that were approved by the SCDE. All items in the test forms were reviewed by the content review committee and the sensitivity review committee and were approved by the SCDE. The current year's EOCEP test form specifications are presented in tables 8.1 through 8.4 by subject.

Table 8.1
Item Distribution by Content Domain for Algebra 1/Math Tech 2

Content Domain*	Fall	Spring	Summer
EA-1	7	8	9
EA-2	9	9	9
EA-3	8	7	7
EA-4	10	12	10
EA-5	12	10	11
EA-6	4	4	4
Totals	50	50	50

*EA-1: The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation

EA-2: The student will demonstrate through the mathematical processes an understanding of the real number system and operations involving exponents, matrices, and algebraic expressions.

EA-3: The student will demonstrate through the mathematical processes an understanding of relationships and functions.

EA-4: The student will demonstrate through the mathematical processes an understanding of the procedures for writing and solving linear equations and inequalities.

EA-5: The student will demonstrate through the mathematical processes an understanding of the graphs and characteristics of linear equations and inequalities.

EA-6: The student will demonstrate through the mathematical processes an understanding of quadratic relationships and functions.

TABLE 8.2
Item Distribution by Content Domain for Biology

Content Domain*	Fall	Spring	Summer
B-1	11	10	11
B-2	9	10	9
B-3	10	10	10
B-4	11	11	11
B-5	9	9	9
B-6	10	10	10
Totals	60	60	60

*B-1: The student will demonstrate an understanding of how scientific inquiry and technological design, including mathematical analysis, can be used appropriately to pose questions, seek answers, and develop solutions.

B-2: The student will demonstrate an understanding of the structure and function of cells and their organelles.

B-3: The student will demonstrate an understanding of the flow of energy within and between living systems.

B-4: The student will demonstrate a understanding of the molecular basis of heredity.

B-5: The student will demonstrate an understanding of biological evolution and the diversity of life.

B-6: The student will demonstrate an understanding of the interrelationships among organisms and the biotic and abiotic components of their environments.

Table 8.3
Item Distribution by Content Domain for English 1

Content Domain*	Fall	Spring	Summer
E1-1	20	18	20
E1-2	6	9	9
E1-3	4	7	7
E1-4	10	10	11
E1-6	15	11	8
Totals	55	55	55

*E1-1: The student will read and comprehend a variety of literary texts in print and nonprint formats.

E1-2: The student will read and comprehend a variety of informational texts in print and nonprint formats.

E1-3: The student will use word analysis and vocabulary strategies to read fluently.

E1-4: The student will create written work that has a clear focus, sufficient detail, coherent organization, effective use of voice, and correct use of the conventions of written Standard American English.

E1-6: The student will access and use information from a variety of sources.

TABLE 8.4**Item Distribution by Content Domain for US History and Constitution**

Content Domain*	Fall	Spring	Summer
USHC-1	2	8	2
USHC-2	8	6	8
USHC-3	4	6	4
USHC-4	5	8	5
USHC-5	7	6	7
USHC-6	5	6	5
USHC-7	8	8	8
USHC-8	6	8	6
USHC-9	8	0	8
USCH-10	2	0	2
Totals	55	56	55

*USHC-1: The student will demonstrate an understanding of the settlement of North America.

USHC-2: The student will demonstrate an understanding of the establishment of the United States as a new nation.

USHC-3: The student will demonstrate an understanding of the westward movement and the resulting regional conflicts that took place in America in the nineteenth century.

USHC-4: The student will demonstrate an understanding of the causes and the course of the Civil War and Reconstruction in America.

USHC-5: The student will demonstrate an understanding of major social, political, and economic developments that took place in the United States during the second half of the nineteenth century.

USHC-6: The student will demonstrate an understanding of foreign developments that contributed to the United States' emergence as a world power in the twentieth century.

USHC-7: The student will demonstrate an understanding of the economic boom-and-bust in America in the 1920s and 1930s, in resultant political instability, and the subsequent worldwide response.

USHC-8: The student will demonstrate an understanding of the impact of World War II on United States' foreign and domestic policies.

USHC-9: The student will demonstrate an understanding of the social, economic, and political events that impacted the United States during the Civil War era.

USHC-10: The student will demonstrate an understanding of developments in foreign policy and economics that have taken place in the United States since the fall of the Soviet Union and its satellite states in 1992.

8.2 ITEM DEVELOPMENT

All EOCEP items were developed with reference to the South Carolina academic standards and measurement guidelines. Various committees reviewed all items; items approved by these committees and the SCDE were field-tested. Items demonstrating satisfactory performance on field tests became eligible for inclusion in operational forms.

8.3 DIFFERENTIAL ITEM FUNCTIONING

A critical issue in statewide high-stakes testing is whether the test is fair to all test-takers; therefore, an important goal of item and test development is to produce a pool of items that are judged to be free of bias either toward or against any group of students. All EOCEP items were reviewed both for bias and for differential item functioning (DIF).

The sensitivity review committee examined the EOCEP items for potential bias, including language that might disadvantage a particular group, might be considered offensive to members of a particular group, or might present obstacles to a particular group due to factors unrelated to content and processes specified in the standards.

As with other statistical methodologies, there are numerous widely accepted approaches to detecting potential unfairness in test items. Many of these methods fall into the general category of DIF analyses. DIF statistics provide information regarding relative group performance at the item level for gender and ethnic comparisons while controlling for ability. Once an item is flagged for a significant DIF, judgment is used to determine whether the difference in difficulty shown by the DIF index is unfairly related to group membership. The DIF statistics do not necessarily indicate bias or unfairness in an item but may simply show the relative strengths and weaknesses of the two groups being compared after the overall ability that the test is intended to measure has been controlled for.

Procedure:

The procedure that DRC selected for detecting DIF was the Mantel-Haenszel (MH) chi-square for dichotomous items. DRC calculated the Mantel-Haenszel statistic (MH D-DIF) for MC items (Holland and Thayer 1988) to measure the degree and magnitude of DIF. The examinee group of interest is the *focal* group, and the group to which performance on the item is being compared is the *reference* group. In this report, the focal groups for DIF were females and African Americans.

Items were separated into one of three categories on the basis of DIF statistics (Holland and Thayer 1988; Dorans and Holland 1993): negligible DIF (category A), intermediate DIF (category B), and large DIF (category C). The items in category C, which exhibit significant DIF, are of primary concern.

Positive values of *delta* indicate that the item is easier for the *focal* group, suggesting that the item favors the *focal* group. A negative value of *delta* indicates that the item is more difficult for the *focal* group. The item classifications are based on the Mantel-Haenszel chi-square and the MH delta (Δ) value as follows:

- The item is classified as C category if the absolute value of the MH delta value (i.e., $|\Delta|$) is significantly greater than 1 and also greater than or equal to 1.5.
- The item is classified as B category if the MH delta value (Δ) is significantly different from 0 and either the absolute value of the MH delta ($|\Delta|$) is less than 1.5 or the absolute value of the MH delta ($|\Delta|$) is not significantly different from 1.
- The item is classified as A category if delta value (Δ) is not significantly different from 0 or the absolute value of delta ($|\Delta|$) is less than or equal to 1.

The data in table 8.5, below, summarize the number of items in DIF categories for the current year's operational test items.

When the operational forms were constructed, all item statistics from the initial field test were reviewed and approved by the SCDE. Due to the large number of items subjected to DIF analyses, erroneous flags could be expected. All flagged items were closely examined by the SCDE. Inclusion of any flagged item on an operational form (i.e., an item classified as C category) was possible only when the SCDE had approved that item.

Table 8.5
Summary of Differential Item Functioning for Operational Items

Administration	Cat	Whites/African-Americans				Males/Females			
		Alg	Bio	Eng	USHC	Alg	Bio	Eng	USHC
Fall 2013	A+	24	26	16	24	27	29	31	27
	A-	19	29	38	29	18	28	23	25
	B+	0	0	1	1	1	0	0	0
	B-	5	4	0	1	3	2	0	3
	C+	0	0	0	0	0	1	1	0
	C-	2	1	0	0	1	0	0	0
Spring 2014	A+	29	23	19	18	28	35	31	28
	A-	13	35	32	37	21	23	20	27
	B+	0	0	2	0	1	0	3	0
	B-	7	2	1	1	0	1	1	1
	C+	0	0	0	0	0	0	0	0
	C-	1	0	1	0	0	1	0	0
Summer 2014*	A+	--	--	--	--	--	--	--	--
	A-	--	--	--	--	--	--	--	--
	B+	--	--	--	--	--	--	--	--
	B-	--	--	--	--	--	--	--	--
	C+	--	--	--	--	--	--	--	--
	C-	--	--	--	--	--	--	--	--

*Due to low N counts, DIF was not calculated for the summer administrations

Note: Includes all students who attempted the test using a regular form except home school students and students in an adult education program.

8.4 CORRELATIONS AMONG CONTENT DOMAINS

Evidence of internal structure was examined using correlations among content domains. On the following pages, tables 8.6 through 8.9 report the correlation matrices for the raw scores among content domains for each test.

Table 8.6
Correlations among Domain Scores for Algebra 1/Math Tech 2

Domain	EA-1	EA-2	EA-3	EA-4	EA-5	EA-6	Number of Items
Fall 2013 (N=7,728)							
EA-1	1	0.518	0.463	0.515	0.560	0.333	7
EA-2	—	1	0.517	0.577	0.591	0.386	9
EA-3	—	—	1	0.508	0.524	0.363	8
EA-4	—	—	—	1	0.628	0.433	10
EA-5	—	—	—	—	1	0.415	12
EA-6	—	—	—	—	—	1	4
Spring 2014 (N=50,692)							
EA-1	1	0.517	0.503	0.562	0.582	0.399	8
EA-2	—	1	0.556	0.609	0.594	0.454	9
EA-3	—	—	1	0.592	0.583	0.414	7
EA-4	—	—	—	1	0.654	0.455	12
EA-5	—	—	—	—	1	0.475	10
EA-6	—	—	—	—	—	1	4
Summer 2014 (N=182)							
EA-1	1	0.339	0.190	0.339	0.349	0.105	9
EA-2	—	1	0.323	0.491	0.409	0.235	9
EA-3	—	—	1	0.235	0.230	0.144	7
EA-4	—	—	—	1	0.510	0.176	10
EA-5	—	—	—	—	1	0.235	11
EA-6	—	—	—	—	—	1	4

Note: Includes all students who attempted the test using a complete regular form except home school students and students in an adult education program.

Table 8.7
Correlations among Domain Scores for Biology

Domain	B-1	B-2	B-3	B-4	B-5	B-6	Number of Items
Fall 2013 (N=12,987)							
B-1	1	0.574	0.545	0.595	0.592	0.610	11
B-2	—	1	0.566	0.585	0.558	0.549	9
B-3	—	—	1	0.558	0.548	0.551	10
B-4	—	—	—	1	0.574	0.566	11
B-5	—	—	—	—	1	0.602	9
B-6	—	—	—	—	—	1	10
Spring 2014 (N=40,347)							
B-1	1	0.508	0.581	0.585	0.630	0.598	10
B-2	—	1	0.554	0.604	0.571	0.579	10
B-3	—	—	1	0.617	0.637	0.609	10
B-4	—	—	—	1	0.667	0.638	11
B-5	—	—	—	—	1	0.673	9
B-6	—	—	—	—	—	1	10
Summer 2014 (N=59)							
B-1	1	0.623	0.632	0.471	0.353	0.554	11
B-2	—	1	0.576	0.466	0.429	0.594	9
B-3	—	—	1	0.573	0.300	0.473	10
B-4	—	—	—	1	0.339	0.422	11
B-5	—	—	—	—	1	0.556	9
B-6	—	—	—	—	—	1	10

Note: Includes all students who attempted the test using a regular form except home school students and students in an adult education program.

Table 8.8
Correlations among Domain Scores for English 1

Domain	E1-1	E1-2	E1-3	E1-4	E1-6	Number of Items
Fall 2013 (N=7,262)						
E1-1	1	0.543	0.520	0.544	0.660	20
E1-2	—	1	0.433	0.437	0.560	6
E1-3	—	—	1	0.414	0.536	4
E1-4	—	—	—	1	0.554	10
E1-6	—	—	—	—	1	15
Spring 2014 (N=48,867)						
E1-1	1	0.650	0.599	0.625	0.651	18
E1-2	—	1	0.589	0.559	0.600	9
E1-3	—	—	1	0.520	0.558	7
E1-4	—	—	—	1	0.590	10
E1-6	—	—	—	—	1	11
Summer 2014 (N=81)						
E1-1	1	0.579	0.484	0.640	0.576	20
E1-2	—	1	0.343	0.458	0.498	9
E1-3	—	—	1	0.449	0.431	7
E1-4	—	—	—	1	0.647	11
E1-6	—	—	—	—	1	8

Note: Includes all students who attempted the test using a regular form except home school students and students in an adult education program.

Table 8.9
Correlations among Domain Scores for US History and Constitution

Domain	USHC-1	USHC-2	USHC-3	USHC-4	USHC-5	USHC-6	USHC-7	USHC-8	USHC-9	USHC-10	Number of Items
Fall 2013 (N=10,288)											
USHC-1	1	0.337	0.243	0.219	0.235	0.302	0.284	0.245	0.263	0.151	2
USHC-2	—	1	0.410	0.383	0.429	0.503	0.505	0.442	0.472	0.269	8
USHC-3	—	—	1	0.268	0.294	0.340	0.351	0.298	0.336	0.187	4
USHC-4	—	—	—	1	0.269	0.318	0.332	0.292	0.315	0.187	5
USHC-5	—	—	—	—	1	0.369	0.374	0.342	0.349	0.200	7
USHC-6	—	—	—	—	—	1	0.467	0.397	0.429	0.249	5
USHC-7	—	—	—	—	—	—	1	0.397	0.430	0.274	8
USHC-8	—	—	—	—	—	—	—	1	0.390	0.232	6
USHC-9	—	—	—	—	—	—	—	—	1	0.265	8
USHC-10	—	—	—	—	—	—	—	—	—	1	2
Spring 2014 (N=37,296)											
USHC-1	1	0.602	0.559	0.599	0.556	0.567	0.608	0.539	—	—	8
USHC-2	—	1	0.544	0.577	0.518	0.549	0.598	0.500	—	—	6
USHC-3	—	—	1	0.542	0.503	0.514	0.559	0.492	—	—	6
USHC-4	—	—	—	1	0.536	0.559	0.590	0.529	—	—	8
USHC-5	—	—	—	—	1	0.512	0.551	0.492	—	—	6
USHC-6	—	—	—	—	—	1	0.577	0.506	—	—	6
USHC-7	—	—	—	—	—	—	1	0.543	—	—	8
USHC-8	—	—	—	—	—	—	—	1	—	—	8
USHC-9	—	—	—	—	—	—	—	—	—	—	0
USHC-10	—	—	—	—	—	—	—	—	—	—	0
Summer 2014 (N=65)											
USHC-1	1	0.243	0.271	0.314	0.224	0.253	0.146	-0.076	0.178	0.187	2
USHC-2	—	1	0.292	0.360	0.197	0.285	0.322	0.268	0.393	0.160	8
USHC-3	—	—	1	0.436	0.305	0.455	0.372	0.411	0.465	0.214	4
USHC-4	—	—	—	1	0.244	0.250	0.282	0.175	0.317	0.203	5
USHC-5	—	—	—	—	1	0.293	0.339	0.075	0.211	0.251	7
USHC-6	—	—	—	—	—	1	0.449	0.389	0.426	0.097	5
USHC-7	—	—	—	—	—	—	1	0.371	0.490	0.317	8
USHC-8	—	—	—	—	—	—	—	1	0.408	0.173	6
USHC-9	—	—	—	—	—	—	—	—	1	0.317	8
USHC-10	—	—	—	—	—	—	—	—	—	1	2

Note: Includes all students who attempted the test using a regular form except home school students and students in an adult education program.

WORKS CITED

- AERA, APA, and NCME 1999. *Standards for Educational and Psychological Testing*. Washington, DC: American Educational Research Association.
- Dorans, Neil J., and Paul W. Holland. 1993. "DIF Detection and Description: Mantel-Haenszel and Standardization." In *Differential Item Functioning*, edited by Paul W. Holland and Howard Wainer. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Feldt, Leonard S., and Audrey L. Qualls. 1998. "Approximating Scale Score Standard Error of Measurement from the Raw Score Standard Error." *Applied Measurement in Education* 11, no. 2:159–77.
- Hambleton, Ronald K., Hariharan Swaminathan, and H. Jane Rogers. 1991. *Fundamentals of Item Response Theory*. Newbury Park, CA: Sage Publications.
- Hanson, Bradley A., and Robert L. Brennan. 1990. "An Investigation of Classification Consistency Indexes Estimated under Alternative Strong True Score Models." *Journal of Educational Measurement* 27:345–59.
- Holland, P. W., and Dorothy T. Thayer. 1988. "Differential Item Performance and the Mantel-Haenszel Procedure." In *Test Validity*, edited by Howard Wainer and Henry I. Braun. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Huynh, Huynh. 1976. "On the Reliability of Decisions in Domain-Referenced Testing." *Journal of Educational Measurement* 13:253–64.
- . 1979. "Computational and Statistical Inference for Two Reliability Indices Based on the Beta-Binomial Model." *Journal of Educational Statistics* 4:231–46.
- Huynh, H., J. Patrick Meyer III, and Karen Barton. 2000. *Technical Documentation for the 1999 Palmetto Achievement Challenge Tests of English Language Arts and Mathematics, Grades Three through Eight*. Columbia: South Carolina Department of Education.
- Linacre, John M., and Benjamin D. Wright. 2003. *WINSTEPS Rasch-Model Computer Program*. Chicago: MESA Press.
- Livingston, Samuel A., and Charles Lewis. 1995. "Estimating the Consistency and Accuracy of Classifications Based on Test Scores." *Journal of Educational Measurement* 32:179–97.
- Rasch, Georg. 1960. *Probabilistic Models for Some Intelligence and Attainment Tests*. Copenhagen: Danish Institute for Educational Research.
- SCDE. 2013a. *Fall/Winter 2013-2014 District Test Coordinator's Supplement*. Columbia: South Carolina Department of Education.
- . 2013b. *Fall/Winter 2013-2014 Test Administration Manual for Online and Paper/Pencil Testing*. Columbia: South Carolina Department of Education.
- . 2014a. *Spring 2014 District Test Coordinator's Supplement*. Columbia: South Carolina Department of Education.

- . 2014b. *Spring 2014 Test Administration Manual for Online and Paper/Pencil Testing*. Columbia: South Carolina Department of Education.
- . 2014c. *Summer 2014 District Test Coordinator's Supplement*. Columbia: South Carolina Department of Education.
- Subkoviak, Michael J. 1976. "Estimating Reliability from a Single Administration of a Criterion-Referenced Test." *Journal of Educational Measurement* 13:265–76.
- Wright, Benjamin D., and Mark H. Stone. 1979. *Best Test Design*. Chicago: MESA Press.

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