



MICHIGAN TEST FOR TEACHER CERTIFICATION

Technical Report: Appendices

OCTOBER 2017–SEPTEMBER 2018

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Michigan Test for Teacher Certification

Technical Report: Appendices

Test Statistics

October 1, 2017 – September 30, 2018

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MTTC Technical Report

Test Statistics: October 1, 2017 – September 30, 2018

Section I: Overview

Volume II of the MTTC Technical Report provides test statistics for test forms administered to at least 10 examinees during test administrations between October 1, 2017 and September 30, 2018. Total test statistics are provided as the basis for understanding the usefulness of the test for licensing decisions. Additional statistical information is provided for tests administered to at least 60 examinees. These statistics provide further information for the multiple-choice items and for the performance assignment(s) on each of the World Language tests except Italian (including Arabic [Modern Standard], Chinese [Mandarin], French, German, Japanese, Russian, and Spanish), and Latin.

Aids to Interpreting the MTTC Statistics

A large amount of statistical information is presented in the reports that follow. Readers may benefit from a number of interpretive aids while considering these data.

- Information presented in these reports is based on four paper-based administrations of the MTTC tests, and eight computer-based testing windows at which selected tests were administered; it is possible that information based on additional test administrations might be different.
- Information in these reports that is based on the test performance of relatively small numbers of examinees (i.e., fewer than 60 examinees) may not be indicative of the performance of larger numbers of examinees.

- The MTTC tests include multiple-choice items and performance assignments. Procedures for estimating the psychometric characteristics of multiple-choice items and tests are well-established and documented in the literature; such procedures for performance assignments, and for tests that combine performance assignments and multiple-choice items, are less well-established and documented. Most MTTC tests presently consist of multiple-choice items only. Each of the MTTC World Language tests except Italian, as well as the Latin test, consists of a multiple-choice section and a performance assignment section. The Spanish, French, German, and Latin content-area tests each include two written performance assignments. The Chinese (Mandarin), Arabic (Modern Standard), Russian, and Japanese tests each contain eight performance assignments.
- The scores that are reported on the MTTC are scaled scores. They have been converted mathematically to a scale with a lower limit of 100, a passing score of 220, and an upper limit of 300. This is the scale used in reporting all MTTC scaled score statistics.

Test Reliability: Overview

As a term used in testing, “reliability/precision” may be defined as “the degree to which test scores for a group of test takers are consistent over repeated applications of a measurement procedure and hence are inferred to be dependable and consistent for an individual test taker; the degree to which scores are free of random errors of measurement for a given group” (*Standards for Educational and Psychological Testing (AERA, APA & NCME, 2014, p. 222)*).

Every test (in fact, every measurement tool) can be expected to produce some measurement error; well-constructed tests produce a small amount of measurement error and generally yield consistent results from one measurement occasion (i.e., test administration) to another.

The process that was used to develop the Michigan Test for Teacher Certification contained features designed to ensure, to the extent possible, that the content and format of the tests would contribute to the stability of the scores derived from them. Test content is based on Michigan regulations, documents, and resources, and was reviewed for accuracy and edited for clarity. Test items were reviewed to ensure that they relate to knowledge and skills judged to be important to the job of an educator entering teaching in Michigan schools.

For the performance assignments, scoring procedures were carefully designed to include detailed orientation, explicit scoring scales and standards, and ongoing verification of scorer accuracy and consistency. Test administration conditions are standardized to be consistent across test sites and occasions.

Statistical estimates of reliability focus on the results of tests—the scores achieved by specific groups of examinees. To the extent that the quality of test materials and procedures can contribute to the underlying reliability and consistency of test scores, the Michigan Tests for Teacher Certification have been developed to ensure high test quality and to affect procedural consistency in test development, administration, and scoring.

Factors that affect statistical estimates of test reliability. Reliability is a property of test scores for a particular group of examinees, not a fixed property of a test. Many factors may affect statistical estimates of test reliability, among them the following.

Number of examinees. The number of examinees whose test scores contribute to a statistical estimate of reliability affects the stability of the estimate. Estimates based on smaller numbers of examinees are typically less stable than estimates based on larger numbers. For this reason, statistical estimates of reliability are calculated for the MTTC only for those tests that are taken by 60 or more examinees.

Self-selection of examinees by test administration date. Typically, examinees can decide when to take a particular test. The tests are offered multiple times per year, and examinees can select when to take and retake the tests. This self-selection can affect the composition, ability level, and variability of the group taking a particular test at a given test administration.

Variability of the group tested. In general, the larger the true variance or true spread of the scores of the examinee group (i.e., the greater the individual differences in the true level of knowledge and skills of the examinees in the particular group taking a test on a particular occasion), the greater will be the reliability coefficient. If the examinees on a particular occasion have generally similar levels of knowledge and skills, statistical estimates of reliability may tend to be lower.

Composite tests. Statistical estimates of reliability for tests that are composites of different types of items (e.g., multiple-choice items and performance assignments) tend to be more relevant when they are calculated on the combined, total test than when they are based on any single component (i.e., multiple-choice items alone or performance assignments alone).

Test content. Statistical estimates of reliability tend to be higher for tests that cover narrower, more homogeneous ranges of content than for tests that cover broad, varied ranges of content. Tests for educator licensure typically must test a broad base of knowledge and skills that pertain to licenses that will apply in a wide range of educational settings, grade levels, and teaching assignments.

Statistical procedures. One approach to gauging the reliability of a test is through the use of statistical procedures. As is the case with most statistical measures of test score reliability, the estimates to be included will be reported on a scale ranging from zero to one (i.e., 0.00 to 1.00). While there is no fixed standard that distinguishes “reliable” test scores from “unreliable” ones, the U.S. Department of Labor Employment and Training Administration has published in a guide, titled *Testing and Assessment: An Employer’s Guide to Good Practices*, the following general guidelines for interpreting reliability coefficients (U.S. DOL, 1999, p. 3):

<u>Reliability coefficient value</u>	<u>Interpretation</u>
.90 and up	Excellent
.80–.89	Good
.70–.79	Adequate
Below .70	May have limited applicability

Adequate numbers of examinees. Statistical reliability estimates, if they are to be interpreted with any degree of confidence, must be based on adequate numbers of examinee scores that may represent some range of examinee knowledge and skill levels and that may provide some variance in examinee score distributions. Statistical reliability estimates based on few examinee scores may be highly dependent on the characteristics of those few examinees and their scores. For this reason, statistical test data are provided in this report only for test fields in which 60 or more examinees take a test at any of the operational test administrations, either paper-based or computer-based, in the program year.

Statistical measures used. A number of statistical techniques have been devised for measuring the consistency (i.e., reliability) of test scores; the choice of a specific index is based on its characteristics, precision, and practicability (Berk, 1980). The indices provided in this report are generally recommended for single-test estimation of test reliability and/or for tests comprising performance assignments and multiple-choice items.

Each statistical procedure selected for the Michigan Test for Teacher Certification provides different information about the reliability of the tests. Measures are reported for the total test and, when applicable, for each test section. However, because pass/fail decisions are made based upon the total test score only, total test reliability is the focus of interest; measures of reliability for individual sections of the test are presented for descriptive purposes only. When considering a reliability index for a single test section, it is important to keep in mind that one section of a test is usually less reliable than the total test because the test section contains fewer test items than the total test.

The statistics that are of primary interest, however, are those that describe the consistency of pass/fail decisions on the total test and the error of measurement associated with the total test. These statistics are provided in the Test Statistics Report by Test Form, which provides information on all tests; and the Technical Report Statistics by Test Field, which provides information on tests with performance assignments.

Reliability estimates for the individual sections of the tests (i.e., multiple-choice and performance assignment) are also provided for descriptive purposes only in the Test Statistics Report by Test Form. These reliability estimates should not be used in place of the total test decision consistency estimates provided.

Organization of the Data

The following reports are presented.

- Technical Report Statistics by Test Form, which provides information for all test fields in order by test field number, and in form order (A, B, C, etc.) within each field where more than one form has been administered. Tests for which no examinees registered during this reporting period will appear in the report with no data provided.
- Technical Report Statistics by Test Field (All Forms): Performance Assignments, which provides information on tests with performance assignments in order by test field number. Tests for which no examinees registered during this reporting period will appear in the report with no data provided.
- Total Scaled Score Distribution by Test Field (All Forms), for all test fields with 10 or more test-takers in order by test field number. Tests for which no examinees registered during this reporting period will not appear in the report.

The table on the following pages comprises a historical list of all MTTC tests in alphabetical order, as of October 1, 2017. Note that some fields, such as 001 Language Arts, are no longer active because they have been replaced due to subsequent changes in the testing program.

Historical List of MTTC Tests in Alphabetical Order

Field Number	Field Name
33	Accounting
37	Agricultural Education
13	Anthropology
102	Arabic (Modern Standard)
41	Art Education
64	Autism Spectrum Disorder (formerly Autistic)
15	Behavioral Studies
74	Bilingual Arabic
79	Bilingual Chaldean
80	Bilingual Chinese
65	Bilingual French
66	Bilingual German
67	Bilingual Greek
73	Bilingual Hebrew
71	Bilingual Italian
81	Bilingual Japanese
77	Bilingual Korean
75	Bilingual Other
72	Bilingual Polish
69	Bilingual Russian
70	Bilingual Spanish
76	Bilingual Vietnamese
78	Bilingual Yugoslavian
17	Biology
34	Business Administration
32	Business Education
98	Business, Management, Marketing and Technology
18	Chemistry
101	Chinese (Mandarin)
91	Communication Arts (Secondary)
50	Computer Science
14	Cultural Studies
46	Dance
82	Early Childhood Education
106	Early Childhood Education (General and Special Education)
20	Earth/Space Science
7	Economics
103	Elementary Education
83	Elementary Education (Replaced with 103 Elementary Education)
59	Emotional Impairment (formerly Emotionally Impaired)
2	English
86	English as a Second Language

Field Number	Field Name
49	Environmental Studies
40	Family and Consumer Sciences
53	Fine Arts
23	French
8	Geography
24	German
43	Health
42	Health, Physical Education, Recreation
62	Hearing Impaired
9	History
54	Humanities
87	Industrial Technology
93	Integrated Science (Elementary)
94	Integrated Science (Secondary)
29	Italian
100	Japanese
3	Journalism
1	Language Arts
90	Language Arts (Elementary)
26	Latin
63	Learning Disabled
48	Library Media
36	Marketing (Distributive Education)
89	Mathematics (Elementary)
22	Mathematics (Secondary)
56	Mentally Impaired
85	Middle Level
99	Music
39	Music Education
44	Physical Education
97	Physical Science
58	Physically or Otherwise Health Impaired
19	Physics
10	Political Science
296	Professional Readiness Examination (formerly Basic Skills): Mathematics subtest
196	Professional Readiness Examination (formerly Basic Skills): Reading subtest
396	Professional Readiness Examination (formerly Basic Skills): Writing subtest
11	Psychology
5	Reading
92	Reading Specialist
27	Russian
51	School Counselor
16	Science
105	Social Studies (Elementary)

Field Number	Field Name
84	Social Studies (Secondary)
12	Sociology
28	Spanish
4	Speech
57	Speech and Language Impaired
88	Technology and Design
95	Visual Arts Education
61	Visually Impaired

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MTTC Technical Report

Test Statistics: October 1, 2017 – September 30, 2018

Section II: Technical Report Statistics by Test Form and Technical Report Statistics by Test Field

The Technical Report Statistics by Test Form provides selected statistics for each test form administered to at least 10 examinees during the program year. The report includes the following information:

- **Test Field.** Tests are listed in order by test field number.
- **Form (A, B, C, etc.).** For each test field, one or more different test forms—each comprising a different set of scorable multiple-choice items and/or different performance assignments—were administered during the reporting period. Data for the same test forms that were administered more than once during the reporting period are combined in this report. If a single test form has been administered, then no test form designation is indicated. It is important to note that comparisons of performance across test forms are subject to a number of variables, including the sample of examinees taking each test form, which changes depending on the time of year of the test administration; the proportion of retakers taking each test form; and other factors. Also note that differences in the number of examinees taking each test form may be due to the fact that the results presented in the current report are based only on administrations within the indicated date window.
- **Number of Tests Taken.** Scores are included in the analyses for this report for examinees who attempted at least one multiple-choice item and provided scorable responses on the performance assignment sections.
- **Mean Scaled Score.** The mean of the total test scaled score achieved by the examinees taking the test form is reported for each test form taken by 10 or more examinees.

- Total Test S.E.M. The standard error of measurement of the total test scaled scores is reported for each test form taken by 60 or more examinees. Total test standard error of measurement (S.E.M.) is estimated as the square root of the absolute error variance for a composite score (Brennan, 2001). This statistic serves as a measure of total test consistency.
- Total Test Decision Consistency. The total test decision (i.e., pass vs. fail) consistency of the total test scaled score is reported for each test form taken by 60 or more examinees. The estimate of total test decision consistency provided is the model suggested by Breyer and Lewis (1994). This is a single-test estimate of total test decision consistency for tests with multiple item formats. Each test is carefully divided to create two halves that are parallel in terms of item content and as equivalent as practicable in terms of item statistics. The decision consistency statistic is reported in the range of 0.00 to 1.00; the closer the estimate is to 1.00, the more consistent (reliable) the decision is considered to be.
- Stratified Coefficient Alpha. The stratified alpha score is reported for each test form taken by 60 or more examinees. Stratified coefficient alpha is an estimate of total test reliability for a test containing a mixture of item types (e.g. multiple-choice, open response or essay) (Qualls 1995). Each item type component of the test is treated as a subtest. Internal consistency estimates for the separate subtests are combined to compute stratified coefficient alpha. Stratified coefficient alpha is reported in the range .00 to 1.00, with a higher number indicating a greater level of consistency (reliability). This statistical estimate was deemed most appropriate for estimating total reliability of some tests with mixed item formats in this testing program because it takes into account differences in length and variance of each subtest.
- Length. The length indicates the number of scorable items included in the multiple-choice section of the test form.

The report also contains the following information for each test form taken by 60 or more examinees.

- **KR20:** For the multiple-choice section: Kuder-Richardson 20 (KR-20). The KR-20 is an overall test consistency (reliability) estimate based on a single test administration (Kuder & Richardson, 1937). It is generally applicable to tests composed of multiple-choice items. KR-20 is reported in the range 0.00 to 1.00, with a higher number indicating a greater level of consistency (reliability). Homogeneity refers to the degree to which the items on the test are consistent with one another. KR-20 is a special case of the Alpha Coefficient and as such can be considered the lower bound of a theoretical reliability coefficient (Crocker & Algina, 1986).
- **G Coefficient:** For the performance assignment section: Generalizability (G) Coefficient. The Generalizability (G) coefficient is a measure of the percent of total score variance that is attributable to persons (i.e., factors within the candidate, such as subject matter knowledge). It reflects the proportion of variability in individuals' scores that is attributable to true score variability rather than to measurement error (Brennan, 2001). It is reported in the range 0.00 to 1.00, with a higher number indicating a greater level of generalizability. The G coefficient is generally applicable to tests composed of open-response items; it gauges the degree to which the results from one test form of the open-response items are generalizable to other forms or other test administrations.

The Technical Report Statistics by Test Field (All Forms) contains the following information for each assignment included in the performance assignment section of each test taken by 60 or more examinees.

- **Test Field Name and Items.** Each item number represents a unique performance assignment administered on a given test form. Each of the MTTC World Language tests except Italian, as well as the Latin test, consists of a multiple-choice section and a performance assignment section. The Spanish, French, German, and Latin content-area tests each include two written performance assignments per test form. The Chinese (Mandarin), Arabic (Modern Standard), Russian, and Japanese tests each contain eight performance assignments per test form.
- **Number of Tests Taken.** The number of tests taken indicates the number of tests taken during the date range indicated.

- Number of Scorable Responses. Indicates the number of responses, from among all tests taken, which were able to be scored (e.g., were not left blank).
- Scorer Agreement. The scoring process documents the number of scorings and the individual scores that each response has received; for this report, the percent of cases in which the first two scorers were in agreement (i.e., assigned identical or adjacent scores), broken down by the percent in exact agreement and the percent that assigned adjacent scores, is provided.
- Inter-rater Reliability. Another procedure used for computing scorer consistency is the intraclass correlation between the first and second score assigned to each response (Snedecor & Cochran, 1967), corrected using the Spearman-Brown formula (McNemar, 1969). (Note: This correlation may be limited by the restriction of range attributable to the fact that only scores ranging from “1” to “4” are assigned to each scorer.)

**Technical Report Statistics by Test Form
and Technical Report Statistics by Test Field
(All Forms: Performance Assignments)**

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**Michigan Test For Teacher Certification (MTTC)
October 1, 2017 - September 30, 2018
Technical Report Statistics by Test Form**

October 1, 2017 - September 30, 2018		Number of Tests Taken	Total Test Scaled Score Indices				Multiple-Choice Section		Performance Assignment Section
			Mean	SEM	Decision Consistency	Stratified Alpha	Length	KR20	G Coefficient
Test Field	Form								
English (002)	A	248	236	11.5	0.86	--	80	0.81	--
	B	259	234	12.0	0.82	--	80	0.83	--
	C	197	228	12.1	0.90	--	80	0.87	--
Journalism (003)	A	2	--	--	--	--	80	--	--
	B	10	201	--	--	--	80	--	--
Speech (004)	A	15	266	--	--	--	80	--	--
	B	11	263	--	--	--	80	--	--
Reading (005)	A	2	--	--	--	--	80	--	--
	B	4	--	--	--	--	80	--	--
	C	23	248	--	--	--	80	--	--
	D	10	251	--	--	--	80	--	--
	E	9	--	--	--	--	80	--	--
	F	6	--	--	--	--	80	--	--
	G	6	--	--	--	--	80	--	--
	H	11	234	--	--	--	80	--	--
Economics (007)	A	9	--	--	--	--	80	--	--
	B	10	227	--	--	--	80	--	--
Geography (008)	A	23	197	--	--	--	80	--	--

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**Michigan Test For Teacher Certification (MTTC)
October 1, 2017 - September 30, 2018
Technical Report Statistics by Test Form**

October 1, 2017 - September 30, 2018		Number of Tests Taken	Total Test Scaled Score Indices				Multiple-Choice Section		Performance Assignment Section
			Mean	SEM	Decision Consistency	Stratified Alpha	Length	KR20	G Coefficient
Test Field	Form								
History (009)	A	117	214	11.2	0.77	--	80	0.80	--
	B	87	216	11.2	0.87	--	80	0.85	--
	C	117	213	11.4	0.71	--	80	0.79	--
Political Science (010)	A	32	198	--	--	--	80	--	--
	B	13	190	--	--	--	80	--	--
Psychology (011)	A	27	234	--	--	--	80	--	--
	B	33	234	--	--	--	80	--	--
	C	26	233	--	--	--	80	--	--
Sociology (012)	A	1	--	--	--	--	80	--	--
Biology (017)	A	59	228	--	--	--	80	--	--
	B	70	230	10.9	0.81	--	80	0.86	--
	C	41	230	--	--	--	80	--	--
Chemistry (018)	A	24	233	--	--	--	80	--	--
	B	35	228	--	--	--	80	--	--
	C	26	215	--	--	--	80	--	--
Physics (019)	A	30	250	--	--	--	80	--	--
	B	13	245	--	--	--	80	--	--

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**Michigan Test For Teacher Certification (MTTC)
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Technical Report Statistics by Test Form**

October 1, 2017 - September 30, 2018		Number of Tests Taken	Total Test Scaled Score Indices				Multiple-Choice Section		Performance Assignment Section
			Mean	SEM	Decision Consistency	Stratified Alpha	Length	KR20	G Coefficient
Test Field	Form								
Earth/Space Science (020)	A	18	228	--	--	--	80	--	--
	B	8	--	--	--	--	80	--	--
	C	6	--	--	--	--	80	--	--
Mathematics (Secondary) (022)	A	22	248	--	--	--	64	--	--
	B	113	237	11.2	0.89	--	64	0.92	--
	C	23	239	--	--	--	64	--	--
	D	101	243	11.1	0.88	--	64	0.90	--
	E	27	249	--	--	--	64	--	--
	F	102	241	11.2	0.91	--	64	0.89	--
French (023)	A	14	213	--	--	--	64	--	--
	B	23	239	--	--	--	64	--	--
German (024)	A	5	--	--	--	--	64	--	--
	B	12	248	--	--	--	64	--	--
Latin (026)	A	4	--	--	--	--	64	--	--
	B	5	--	--	--	--	64	--	--
Russian (027)	A	1	--	--	--	--	28	--	--

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**Michigan Test For Teacher Certification (MTTC)
October 1, 2017 - September 30, 2018
Technical Report Statistics by Test Form**

October 1, 2017 - September 30, 2018		Number of Tests Taken	Total Test Scaled Score Indices				Multiple-Choice Section		Performance Assignment Section
			Mean	SEM	Decision Consistency	Stratified Alpha	Length	KR20	G Coefficient
Test Field	Form								
Spanish (028)	A	83	247	11.9	0.91	0.90	64	0.85	0.84
	B	51	247	--	--	--	64	--	--
	C	42	246	--	--	--	64	--	--
Italian (029)	A	2	--	--	--	--	80	--	--
Marketing Education (036)	A	1	--	--	--	--	80	--	--
Agricultural Education (037)	A	6	--	--	--	--	64	--	--
Family and Consumer Sciences (040)	A	15	254	--	--	--	80	--	--
	B	3	--	--	--	--	80	--	--
Health (043)	A	23	244	--	--	--	80	--	--
	B	22	251	--	--	--	80	--	--
	C	5	--	--	--	--	80	--	--
	D	28	235	--	--	--	80	--	--
	E	25	260	--	--	--	80	--	--
	F	18	238	--	--	--	80	--	--
Physical Education (044)	A	83	226	13.5	0.79	--	80	0.83	--
	B	10	207	--	--	--	80	--	--
	C	93	230	13.8	0.73	--	80	0.76	--
	D	43	227	--	--	--	80	--	--

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**Michigan Test For Teacher Certification (MTTC)
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Technical Report Statistics by Test Form**

October 1, 2017 - September 30, 2018		Number of Tests Taken	Total Test Scaled Score Indices				Multiple-Choice Section		Performance Assignment Section
			Mean	SEM	Decision Consistency	Stratified Alpha	Length	KR20	G Coefficient
Test Field	Form								
Dance (046)	A	3	--	--	--	--	80	--	--
	B	6	--	--	--	--	80	--	--
Library Media (048)	A	13	227	--	--	--	80	--	--
Computer Science (050)	A	3	--	--	--	--	80	--	--
	B	7	--	--	--	--	80	--	--
School Counselor (051)	A	36	246	--	--	--	80	--	--
	B	91	244	10.3	0.88	--	80	0.84	--
	C	30	246	--	--	--	80	--	--
	D	20	230	--	--	--	80	--	--
Fine Arts (053)	A	1	--	--	--	--	80	--	--
	B	7	--	--	--	--	80	--	--
Cognitive Impairment (056)	A	137	221	13.2	0.79	--	80	0.79	--
	B	122	219	13.3	0.71	--	80	0.77	--
	C	122	226	12.9	0.82	--	80	0.82	--
Speech and Language Impaired (057)	A	4	--	--	--	--	80	--	--
Physical or Other Health Impairment (058)	A	6	--	--	--	--	80	--	--

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**Michigan Test For Teacher Certification (MTTC)
October 1, 2017 - September 30, 2018
Technical Report Statistics by Test Form**

October 1, 2017 - September 30, 2018		Number of Tests Taken	Total Test Scaled Score Indices				Multiple-Choice Section		Performance Assignment Section
			Mean	SEM	Decision Consistency	Stratified Alpha	Length	KR20	G Coefficient
Test Field	Form								
Emotional Impairment (059)	A	10	237	--	--	--	80	--	--
	B	43	241	--	--	--	80	--	--
	C	33	245	--	--	--	80	--	--
	D	36	238	--	--	--	80	--	--
Visually Impaired (061)	A	1	--	--	--	--	80	--	--
	B	1	--	--	--	--	80	--	--
Hearing Impaired (062)	A	6	--	--	--	--	80	--	--
Learning Disabilities (063)	A	117	235	11.5	0.83	--	80	0.84	--
	B	109	239	11.2	0.85	--	80	0.85	--
	C	90	237	11.1	0.89	--	80	0.88	--
Autism Spectrum Disorder (064)	A	43	243	--	--	--	80	--	--
	B	86	244	11.2	0.91	--	80	0.73	--
	C	10	253	--	--	--	80	--	--
	D	19	245	--	--	--	80	--	--
Bilingual Education (075)	A	7	--	--	--	--	80	--	--
	B	1	--	--	--	--	80	--	--

(Continued)

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**Michigan Test For Teacher Certification (MTTC)
October 1, 2017 - September 30, 2018
Technical Report Statistics by Test Form**

October 1, 2017 - September 30, 2018		Number of Tests Taken	Total Test Scaled Score Indices				Multiple-Choice Section		Performance Assignment Section
			Mean	SEM	Decision Consistency	Stratified Alpha	Length	KR20	G Coefficient
Test Field	Form								
Social Studies (Secondary) (084)	A	21	220	--	--	--	80	--	--
	B	26	221	--	--	--	80	--	--
	C	159	225	10.1	0.83	--	80	0.85	--
	D	180	227	10.2	0.81	--	80	0.83	--
	E	141	229	9.8	0.84	--	80	0.86	--
Middle Level (085)	A	17	258	--	--	--	80	--	--
	B	1	--	--	--	--	80	--	--
English as a Second Language (086)	A	91	241	11.0	0.87	--	80	0.83	--
	B	87	238	11.4	0.86	--	80	0.85	--
	C	123	234	11.4	0.91	--	80	0.88	--
	D	48	236	--	--	--	80	--	--
	E	52	239	--	--	--	80	--	--
Industrial Technology (087)	A	3	--	--	--	--	80	--	--
	B	6	--	--	--	--	80	--	--
Technology and Design (088)	A	3	--	--	--	--	80	--	--
Mathematics (Elementary) (089)	A	101	229	11.3	0.88	--	64	0.92	--
	B	113	229	11.5	0.83	--	64	0.89	--
	C	18	236	--	--	--	64	--	--
	D	115	246	10.6	0.89	--	64	0.87	--

(Continued)

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**Michigan Test For Teacher Certification (MTTC)
October 1, 2017 - September 30, 2018
Technical Report Statistics by Test Form**

October 1, 2017 - September 30, 2018		Number of Tests Taken	Total Test Scaled Score Indices				Multiple-Choice Section		Performance Assignment Section
			Mean	SEM	Decision Consistency	Stratified Alpha	Length	KR20	G Coefficient
Test Field	Form								
Language Arts (Elementary) (090)	A	25	231	--	--	--	80	--	--
	B	24	230	--	--	--	80	--	--
	C	152	231	12.4	0.78	--	80	0.76	--
	D	158	228	12.5	0.81	--	80	0.83	--
	E	50	226	--	--	--	80	--	--
	F	177	231	12.4	0.84	--	80	0.82	--
Communication Arts (Secondary) (091)	A	7	--	--	--	--	80	--	--
Reading Specialist (092)	A	42	248	--	--	--	80	--	--
	B	37	246	--	--	--	80	--	--
	C	54	232	--	--	--	80	--	--
	D	15	254	--	--	--	80	--	--
Integrated Science (Elementary) (093)	A	6	--	--	--	--	80	--	--
	B	12	242	--	--	--	80	--	--
	C	68	232	10.5	0.86	--	80	0.82	--
	D	72	225	10.2	0.89	--	80	0.84	--
	E	115	232	9.7	0.87	--	80	0.86	--

(Continued)

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**Michigan Test For Teacher Certification (MTTC)
October 1, 2017 - September 30, 2018
Technical Report Statistics by Test Form**

October 1, 2017 - September 30, 2018		Number of Tests Taken	Total Test Scaled Score Indices				Multiple-Choice Section		Performance Assignment Section
			Mean	SEM	Decision Consistency	Stratified Alpha	Length	KR20	G Coefficient
Test Field	Form								
Integrated Science (Secondary) (094)	A	100	219	11.3	0.88	--	80	0.87	--
	B	102	224	11.1	0.71	--	80	0.87	--
	C	10	237	--	--	--	80	--	--
	D	40	225	--	--	--	80	--	--
Visual Arts Education (095)	A	44	237	--	--	--	80	--	--
	B	22	244	--	--	--	80	--	--
	C	19	241	--	--	--	80	--	--
	D	25	239	--	--	--	80	--	--
	E	34	230	--	--	--	80	--	--
Physical Science (097)	A	2	--	--	--	--	80	--	--
	B	8	--	--	--	--	80	--	--
Business, Management, Marketing, & Tech. (098)	A	33	223	--	--	--	80	--	--
	B	9	--	--	--	--	80	--	--
Music Education (099)	A	85	246	9.3	0.96	--	80	0.81	--
	B	81	243	9.5	0.93	--	80	0.82	--
	C	68	249	9.4	0.95	--	80	0.66	--
Japanese (100)	A	2	--	--	--	--	28	--	--
Chinese (Mandarin) (101)	A	19	254	--	--	--	28	--	--
	B	33	254	--	--	--	28	--	--

(Continued)

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Michigan Test For Teacher Certification (MTTC)

October 1, 2017 - September 30, 2018

Technical Report Statistics by Test Form

October 1, 2017 - September 30, 2018		Number of Tests Taken	Total Test Scaled Score Indices				Multiple-Choice Section		Performance Assignment Section
			Mean	SEM	Decision Consistency	Stratified Alpha	Length	KR20	G Coefficient
Test Field	Form								
Arabic (Modern Standard) (102)	A	25	221	--	--	--	28	--	--
	B	38	207	--	--	--	28	--	--
Elementary Education (103)	A	8	--	--	--	--	120	--	--
	B	13	233	--	--	--	120	--	--
	C	520	233	9.0	0.89	--	120	0.91	--
	D	1,069	229	8.9	0.86	--	120	0.91	--
	E	1,071	226	9.2	0.85	--	120	0.90	--
	F	506	228	9.1	0.87	--	120	0.92	--
Social Studies (Elementary) (105)	A	11	215	--	--	--	80	--	--
	B	8	--	--	--	--	80	--	--
	C	49	217	--	--	--	80	--	--
	D	52	222	--	--	--	80	--	--
	E	41	221	--	--	--	80	--	--
Early Childhood Education (General and Special Education) (106)	A	179	219	16.4	0.74	--	80	0.73	--
	B	197	222	16.2	0.73	--	80	0.74	--
	C	184	219	16.0	0.77	--	80	0.83	--

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October 1, 2017 - September 30, 2018
Technical Report Statistics by Test Field (All Forms)**

Test and Item(s)		Number of Tests Taken	Number of Scorable Responses	Performance Assignments			
				Scorer Agreement (%)			Inter-rater Reliability
				Total	Exact	Adjacent	
Spanish (028)	1	176	175	98.9	73.1	25.7	0.87
	2	176	171	100.0	62.6	37.4	0.83
Arabic (Modern Standard) (102)	1	63	60	100.0	100.0	0.0	1.00
	2	63	60	100.0	100.0	0.0	1.00
	3	63	63	100.0	100.0	0.0	1.00
	4	63	63	100.0	100.0	0.0	1.00
	5	63	61	100.0	100.0	0.0	1.00
	6	63	56	100.0	100.0	0.0	1.00
	7	63	56	100.0	100.0	0.0	1.00
	8	63	54	100.0	100.0	0.0	1.00

MTTC Technical Report

Test Statistics: October 1, 2017 – September 30, 2018

Section III: Total Scaled Score Distribution by Test Field

The Total Scaled Score Distribution by Test Field report provides information about the scaled score distributions for the test fields taken by 10 or more examinees. For the MTTC, results are reported on a scale ranging from 100 to 300. A scaled score of 220 represents the minimum passing score for each test.

The reports include the following.

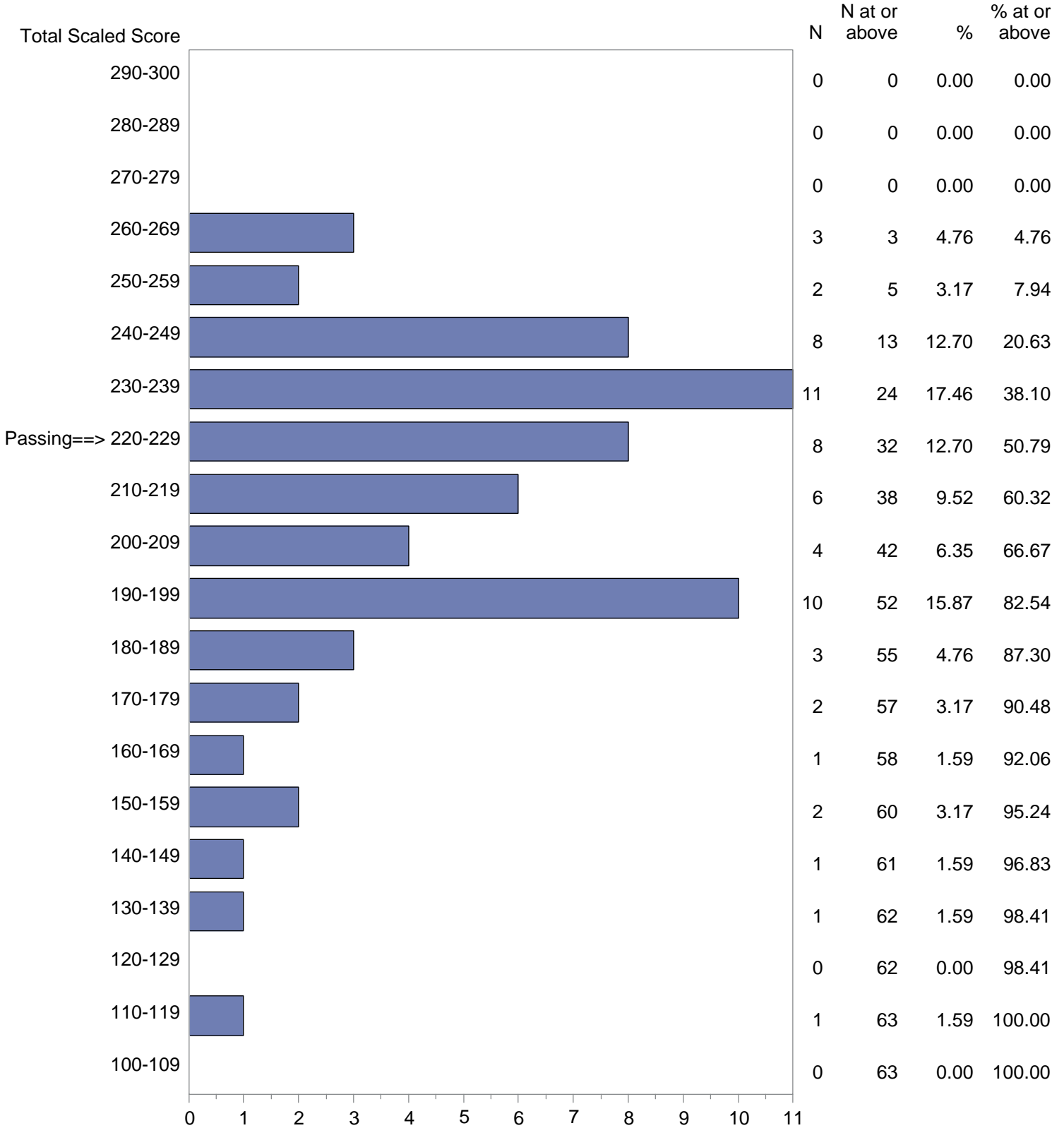
- Distribution of total scaled scores in 10-point increments
- N: the number of scores observed at the scaled scores within the 10-point range indicated
- N at or above: the number of scores observed at or above the lowest scaled score within the 10-point range indicated
- Percent: the percent of scores observed at the scaled scores within the 10-point range indicated
- % at or above: the percent of scores observed at or above the lowest scaled score within the 10-point range indicated

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Michigan Test For Teacher Certification (MTTC)
 October 1, 2017 - September 30, 2018
 Total Scaled Score Distribution by Test Field (All Forms)

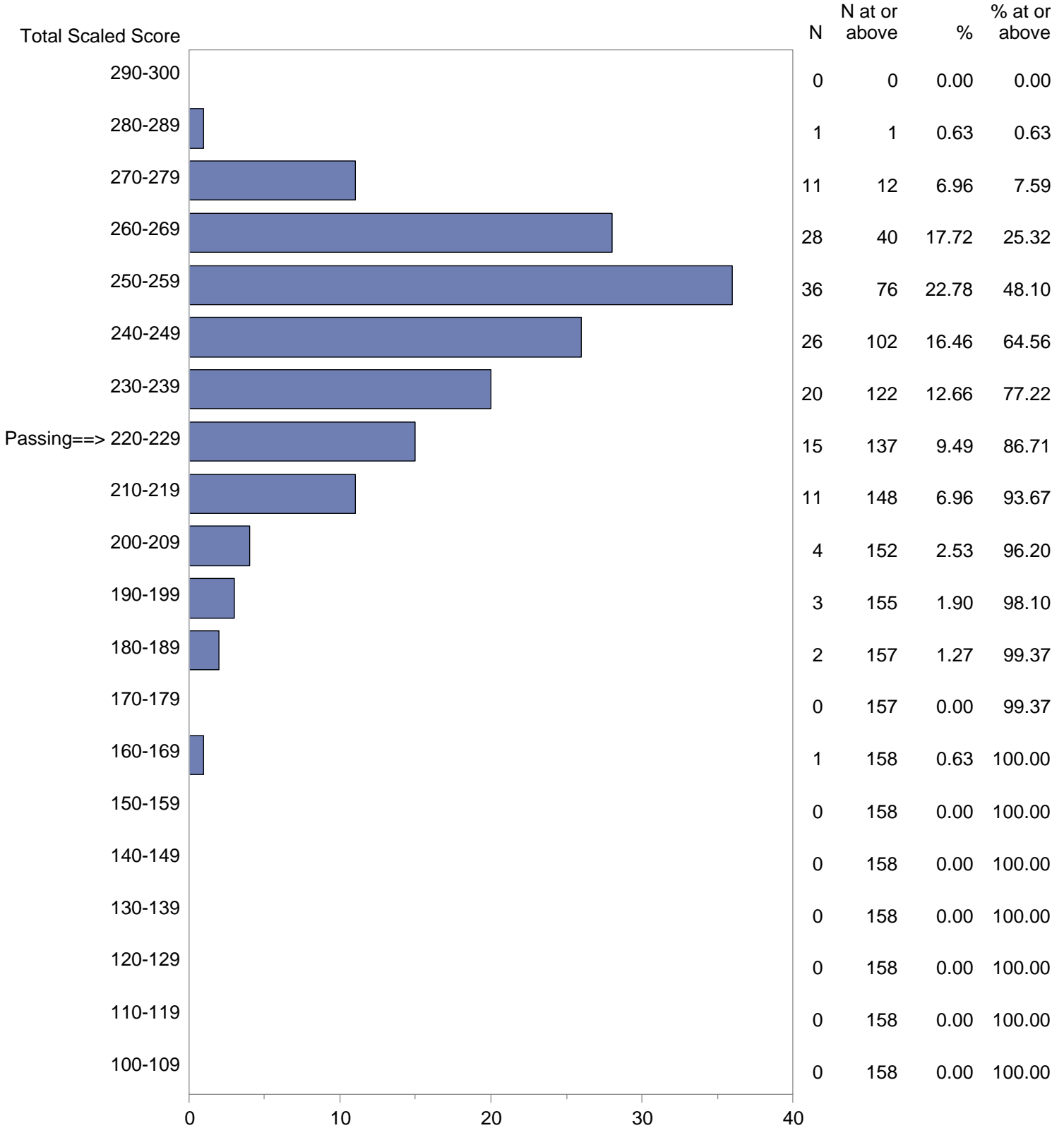
Test Field=Arabic (Modern Standard) (102)



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Michigan Test For Teacher Certification (MTTC)
 October 1, 2017 - September 30, 2018
 Total Scaled Score Distribution by Test Field (All Forms)

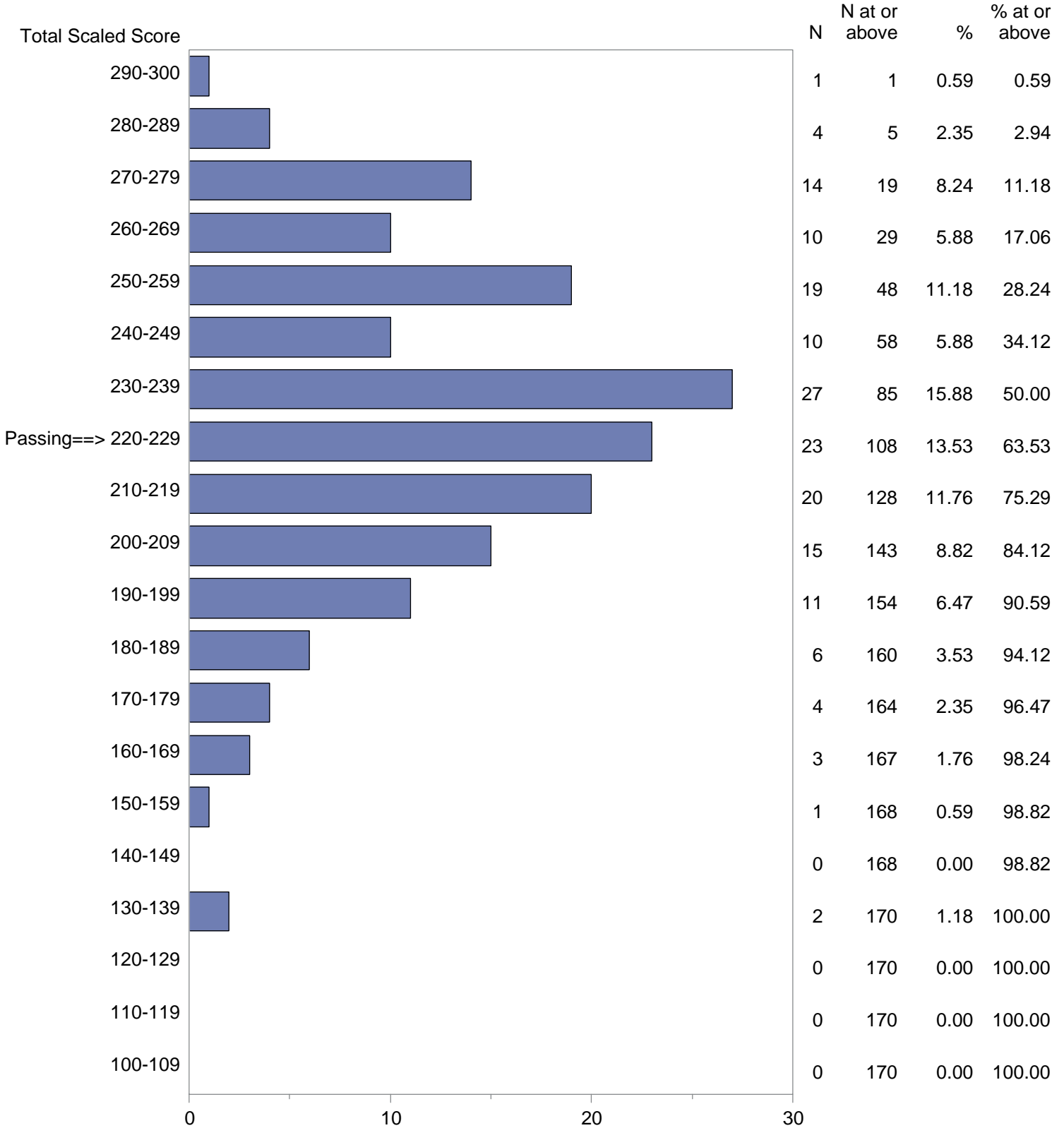
Test Field=Autism Spectrum Disorder (064)



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Michigan Test For Teacher Certification (MTTC)
 October 1, 2017 - September 30, 2018
 Total Scaled Score Distribution by Test Field (All Forms)

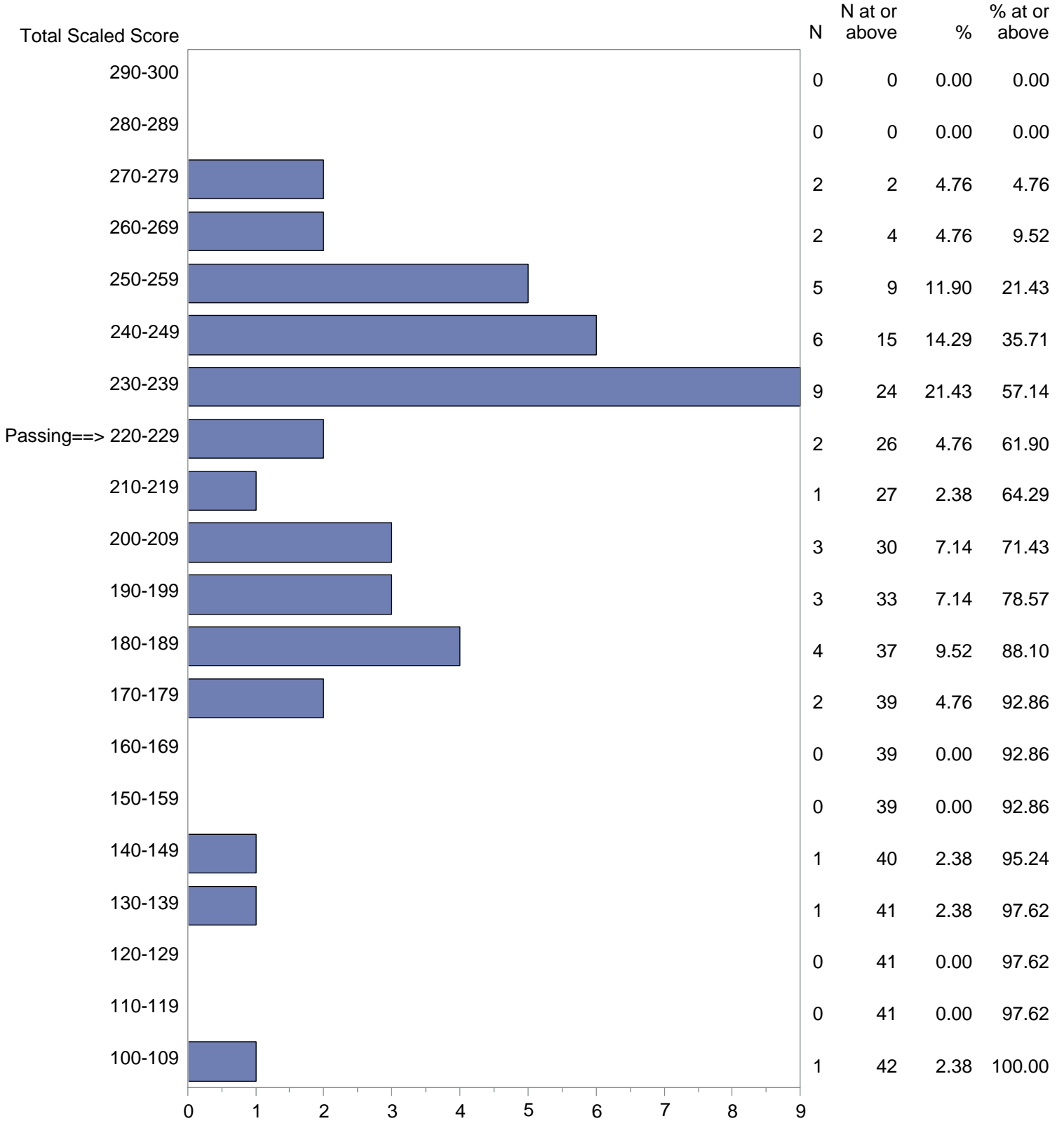
Test Field=Biology (017)



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Michigan Test For Teacher Certification (MTTC)
 October 1, 2017 - September 30, 2018
 Total Scaled Score Distribution by Test Field (All Forms)

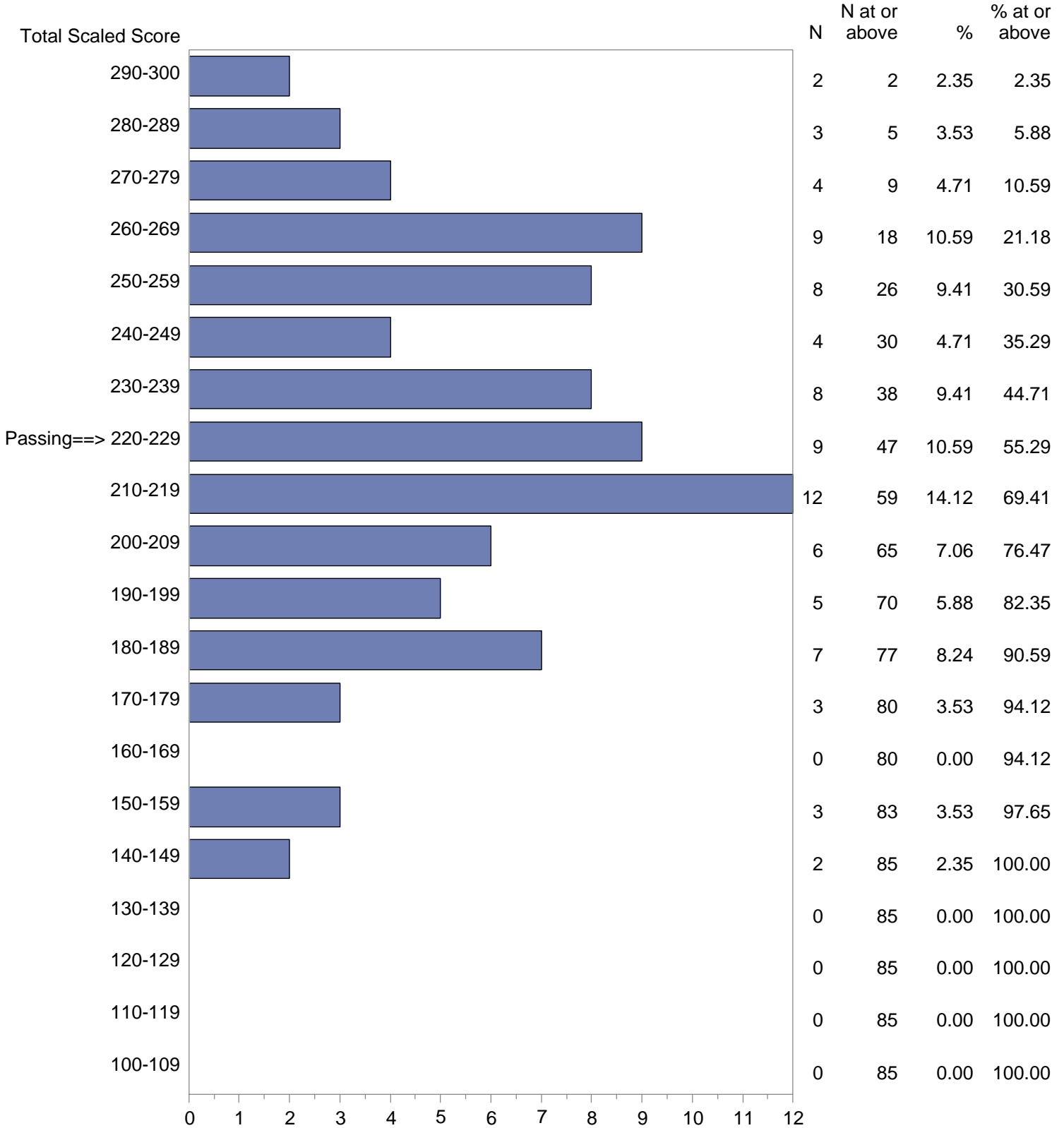
Test Field=Business, Management, Marketing, & Tech. (098)



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Michigan Test For Teacher Certification (MTTC)
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 Total Scaled Score Distribution by Test Field (All Forms)

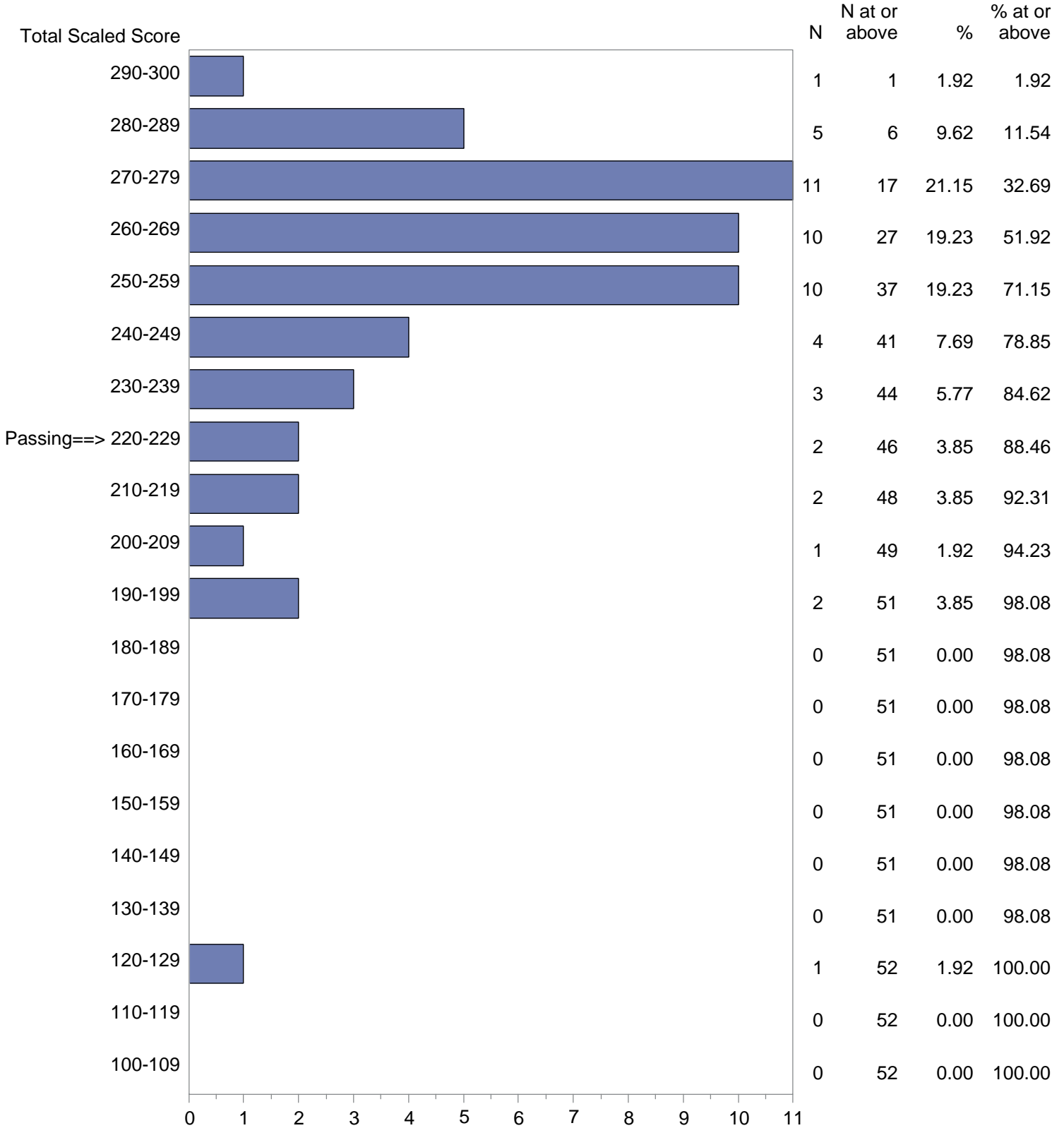
Test Field=Chemistry (018)



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Michigan Test For Teacher Certification (MTTC)
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 Total Scaled Score Distribution by Test Field (All Forms)

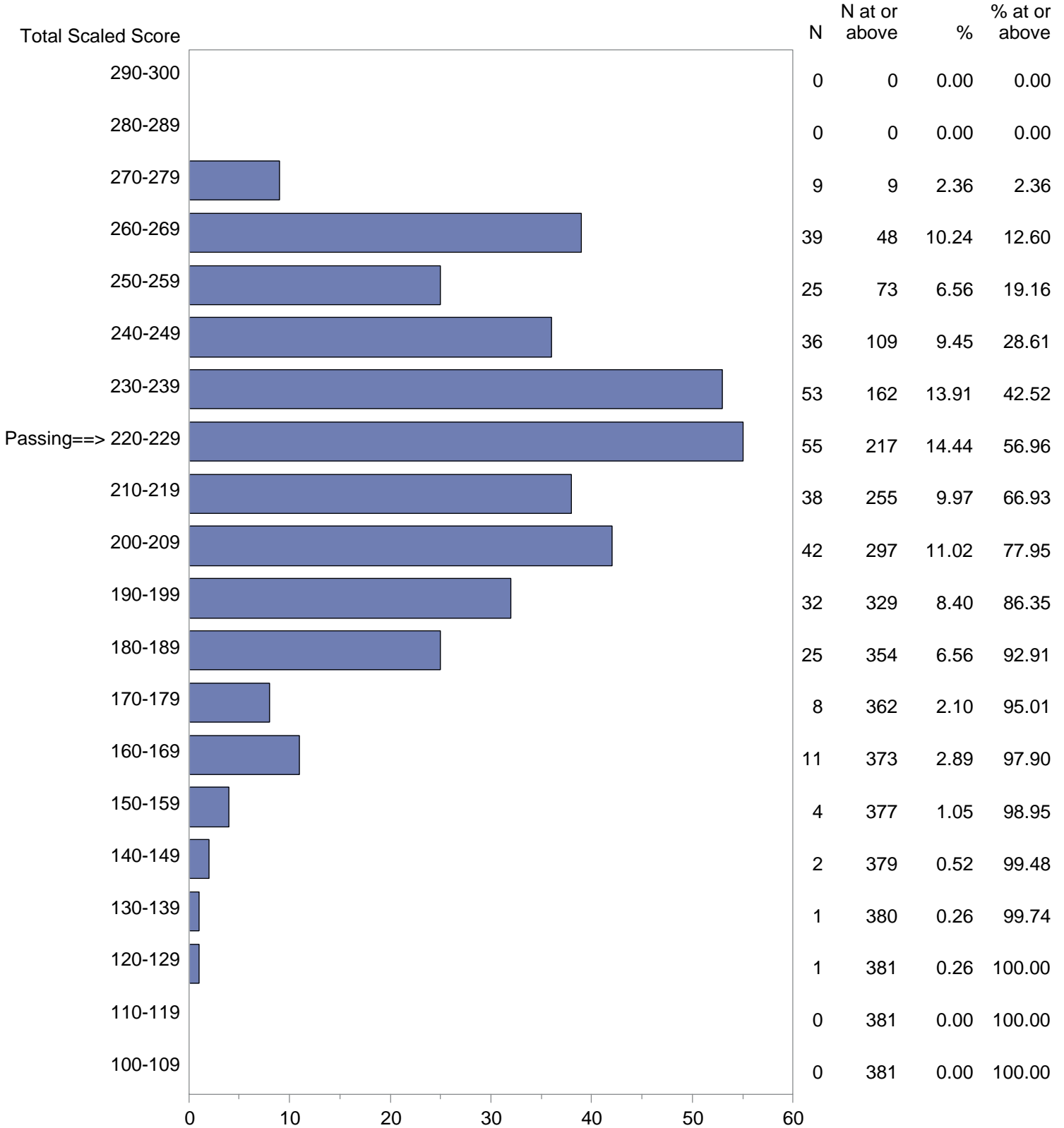
Test Field=Chinese (Mandarin) (101)



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Michigan Test For Teacher Certification (MTTC)
 October 1, 2017 - September 30, 2018
 Total Scaled Score Distribution by Test Field (All Forms)

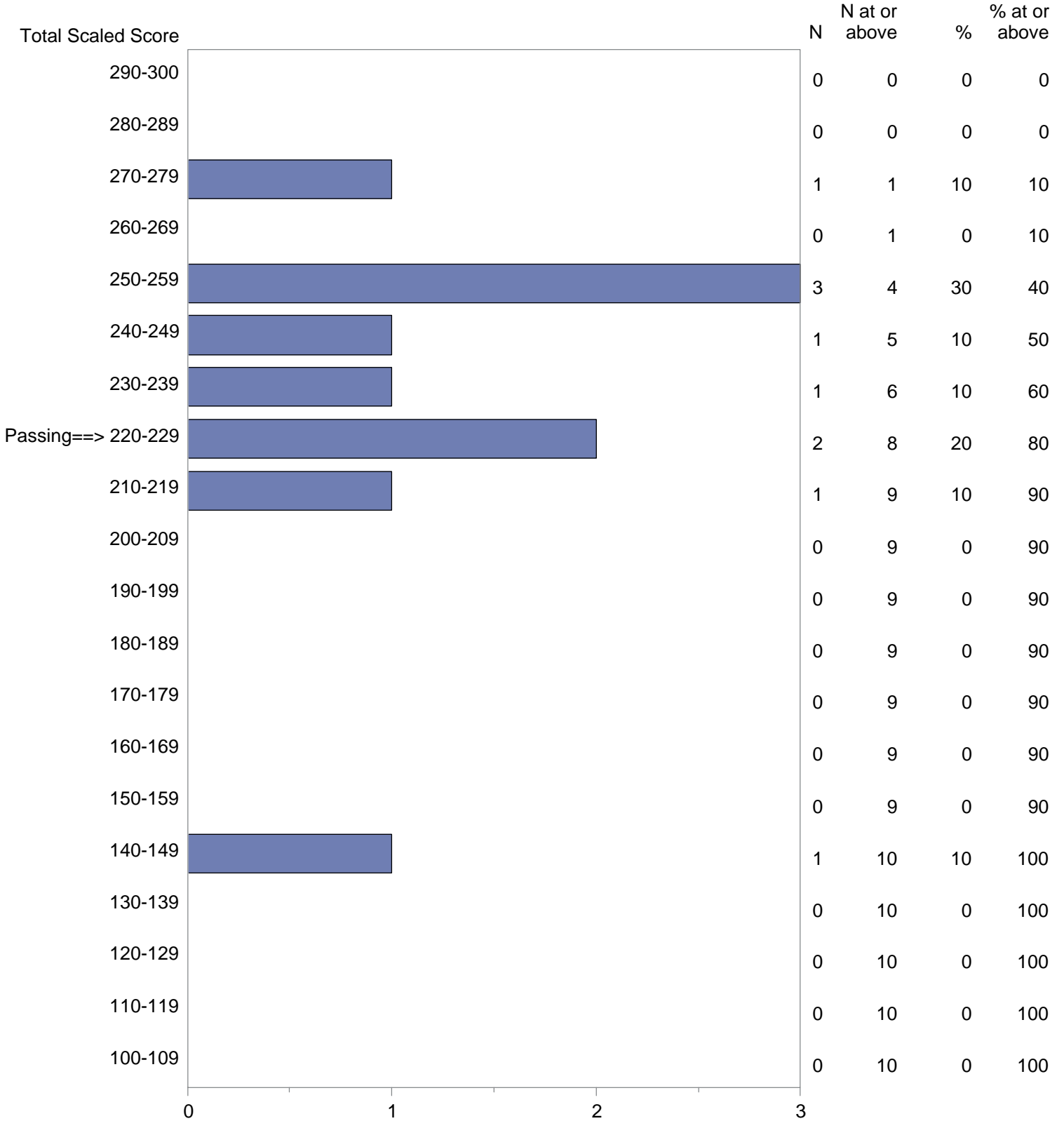
Test Field=Cognitive Impairment (056)



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Michigan Test For Teacher Certification (MTTC)
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 Total Scaled Score Distribution by Test Field (All Forms)

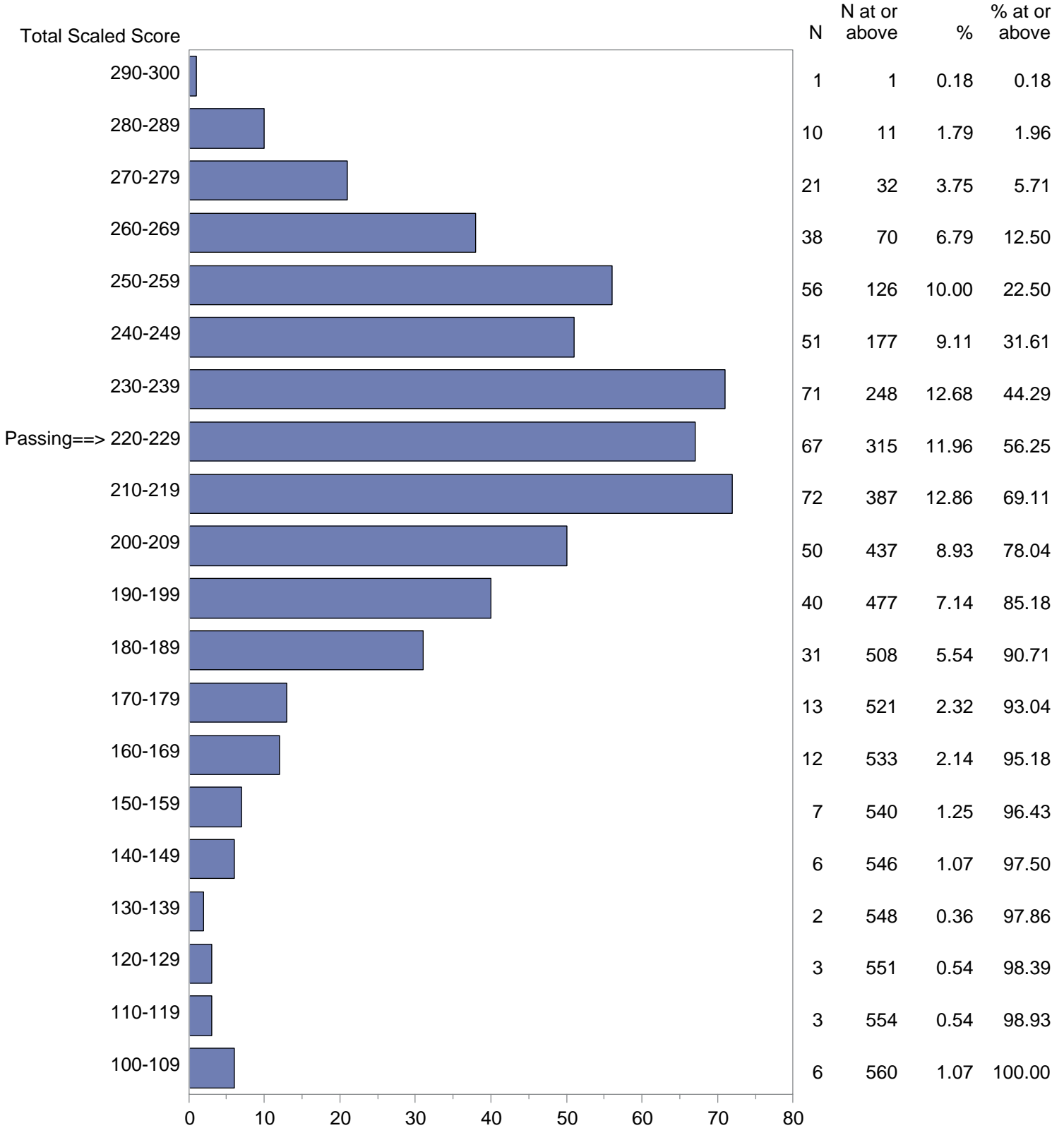
Test Field=Computer Science (050)



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Michigan Test For Teacher Certification (MTTC)
 October 1, 2017 - September 30, 2018
 Total Scaled Score Distribution by Test Field (All Forms)

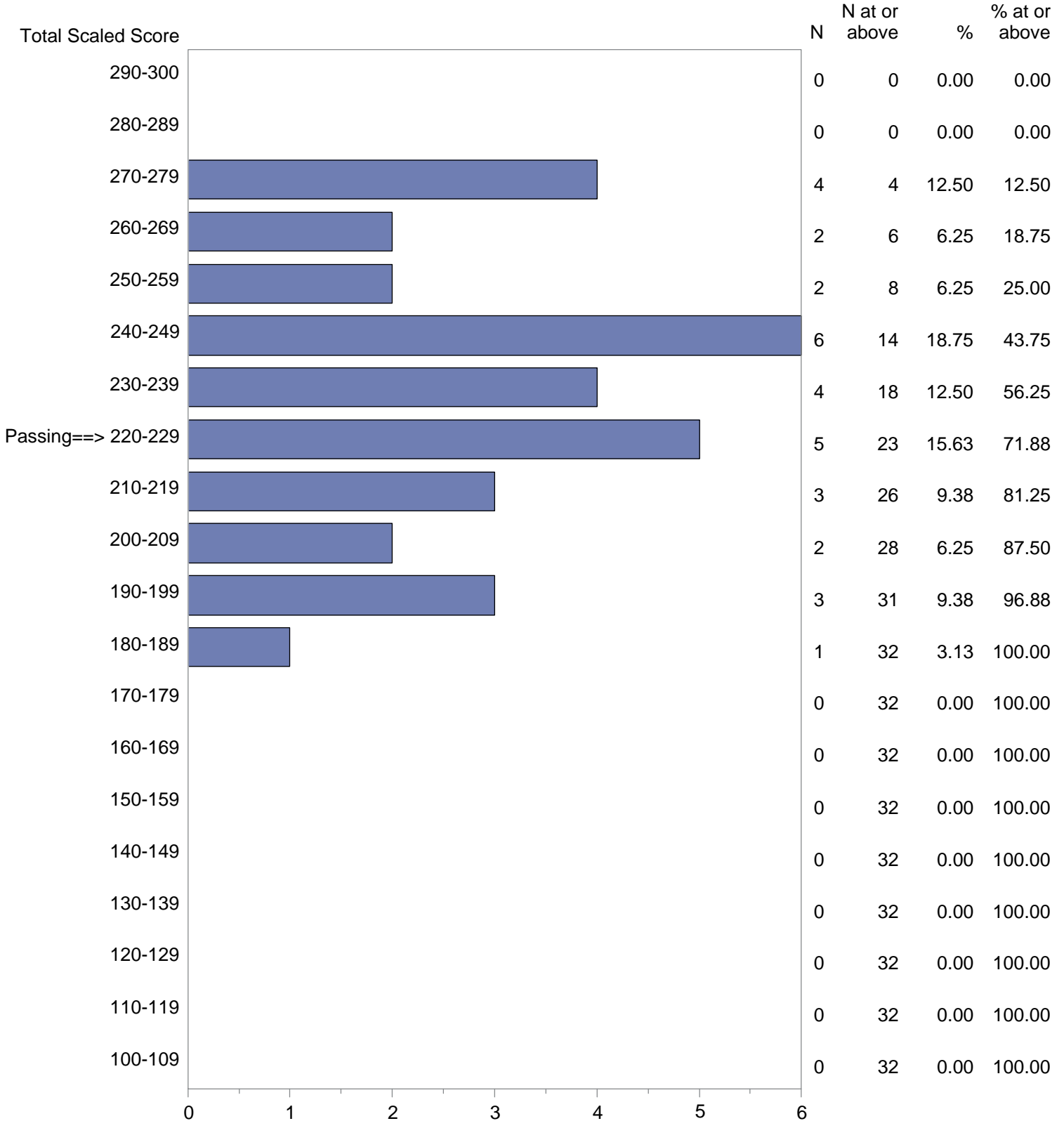
Test Field=Early Childhood Education (General and Special Education) (106)



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Michigan Test For Teacher Certification (MTTC)
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 Total Scaled Score Distribution by Test Field (All Forms)

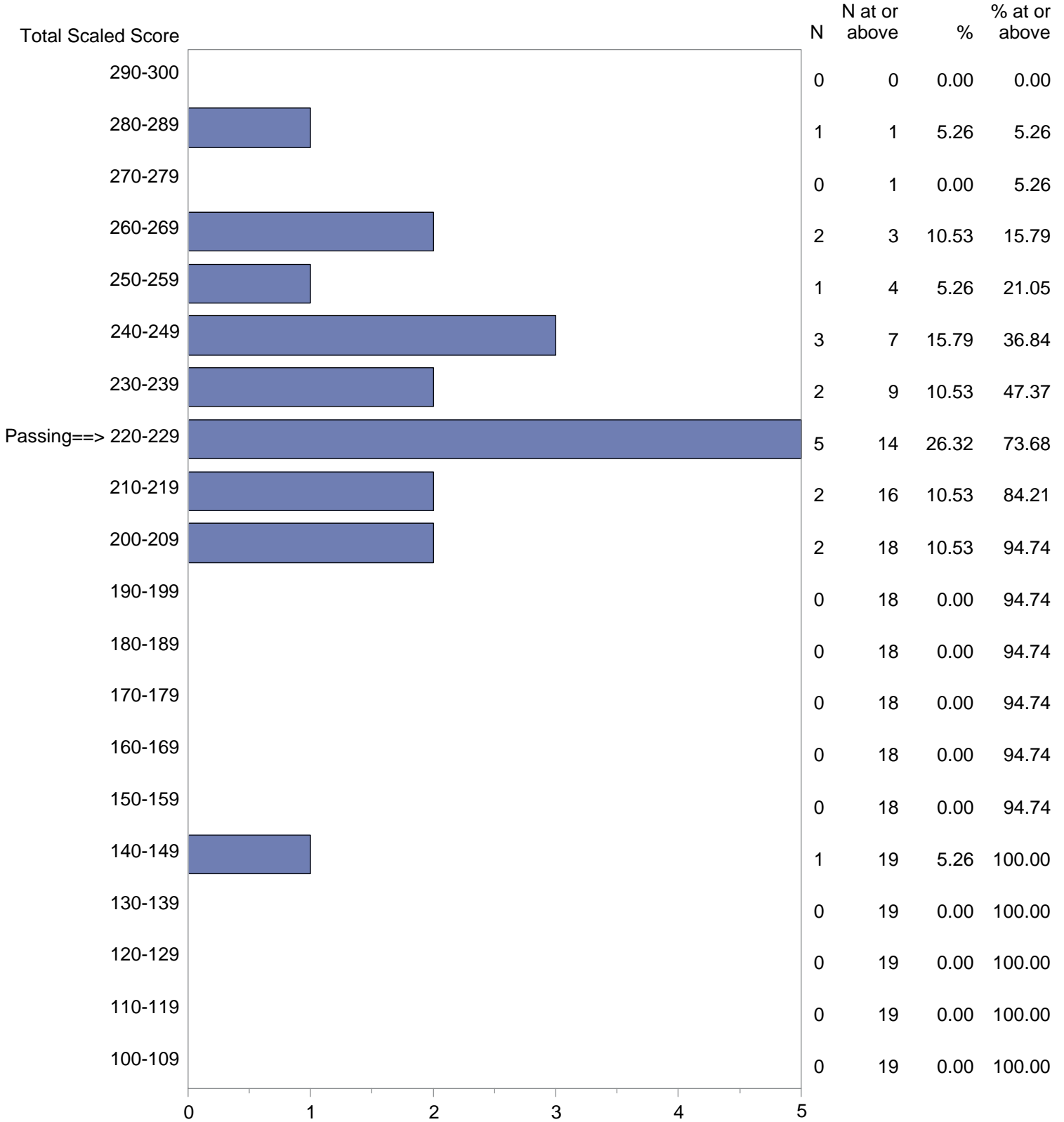
Test Field=Earth/Space Science (020)



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Michigan Test For Teacher Certification (MTTC)
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 Total Scaled Score Distribution by Test Field (All Forms)

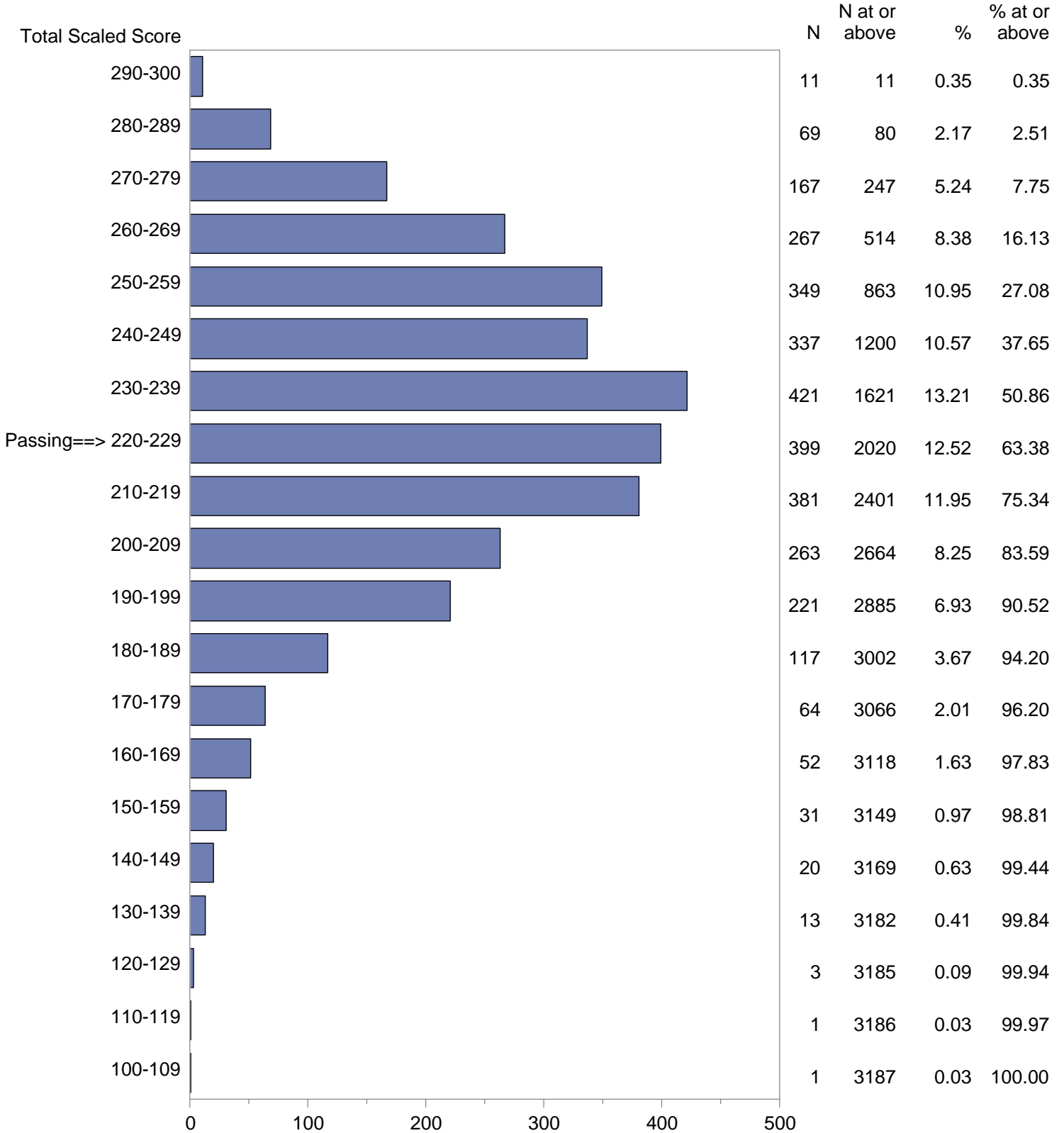
Test Field=Economics (007)



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Michigan Test For Teacher Certification (MTTC)
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 Total Scaled Score Distribution by Test Field (All Forms)

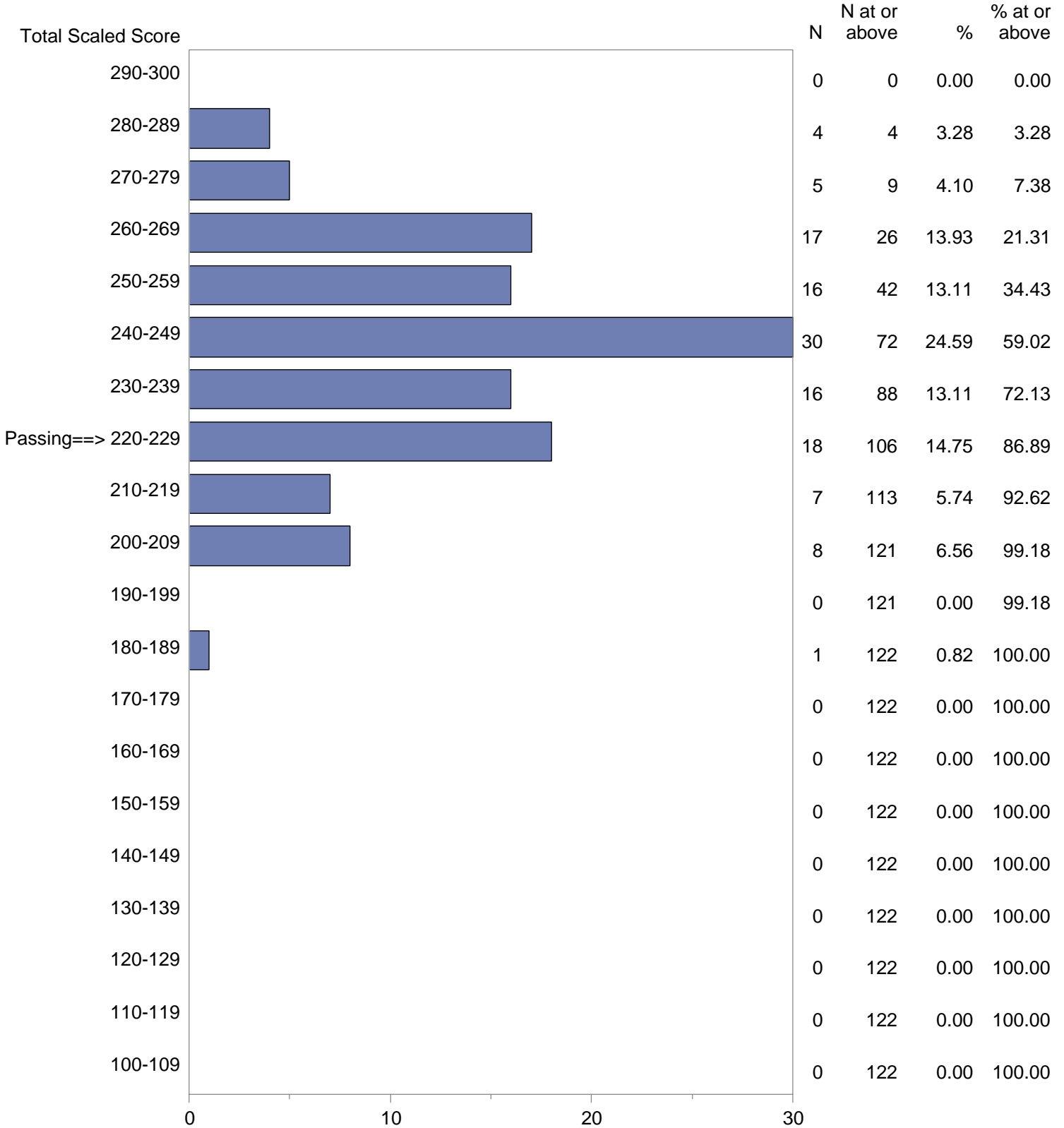
Test Field=Elementary Education (103)



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 Total Scaled Score Distribution by Test Field (All Forms)

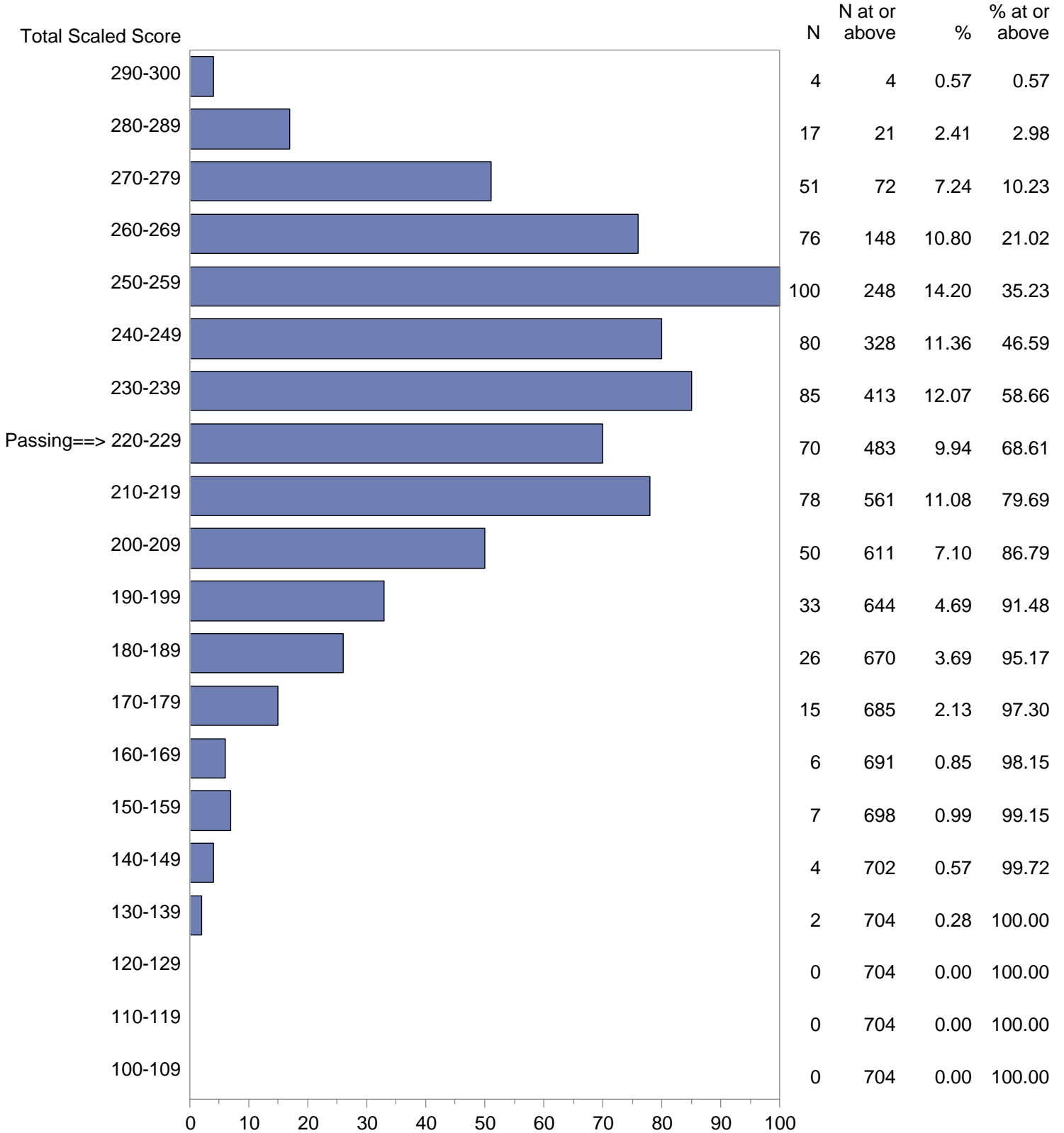
Test Field=Emotional Impairment (059)



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Michigan Test For Teacher Certification (MTTC)
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 Total Scaled Score Distribution by Test Field (All Forms)

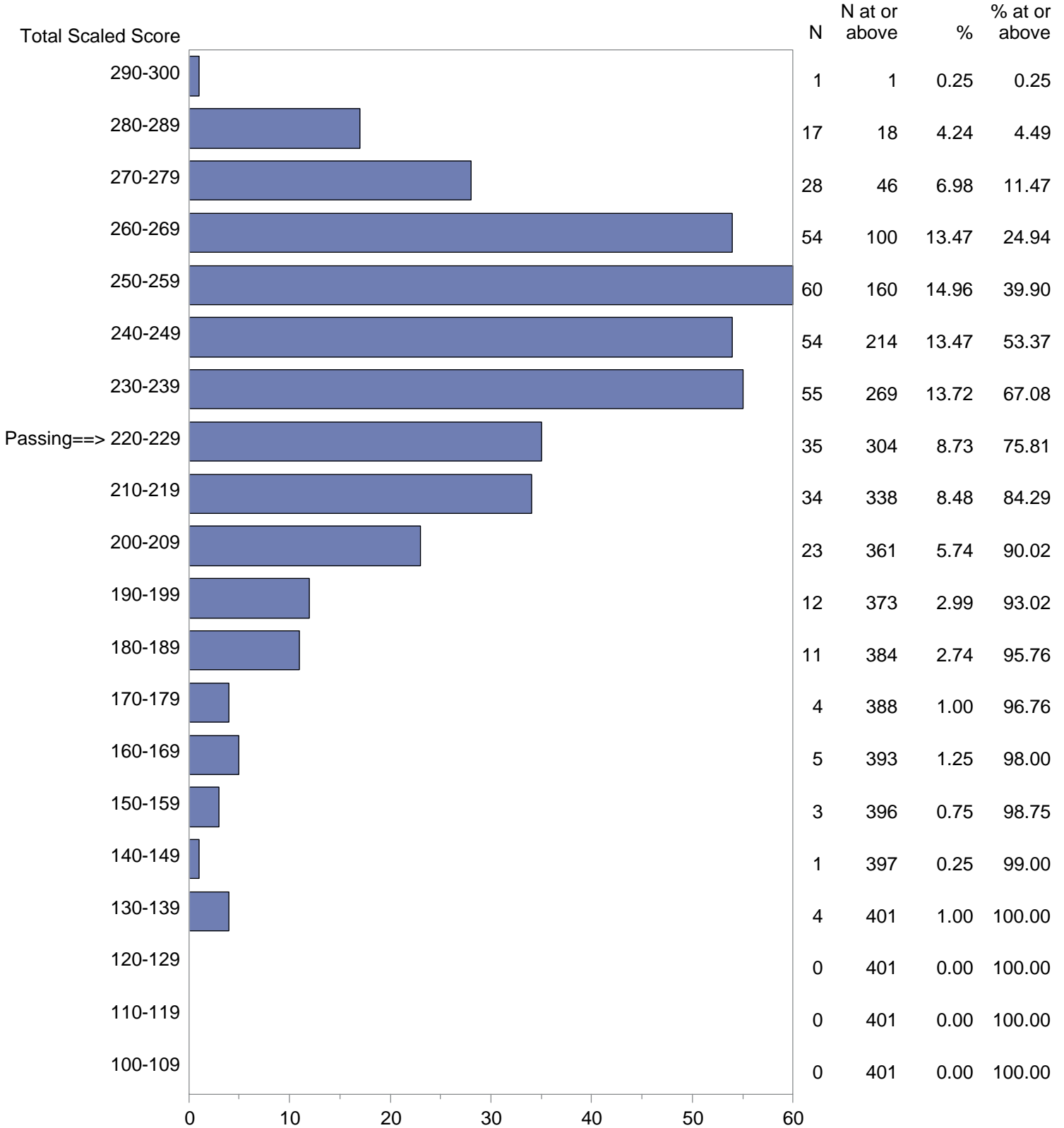
Test Field=English (002)



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Michigan Test For Teacher Certification (MTTC)
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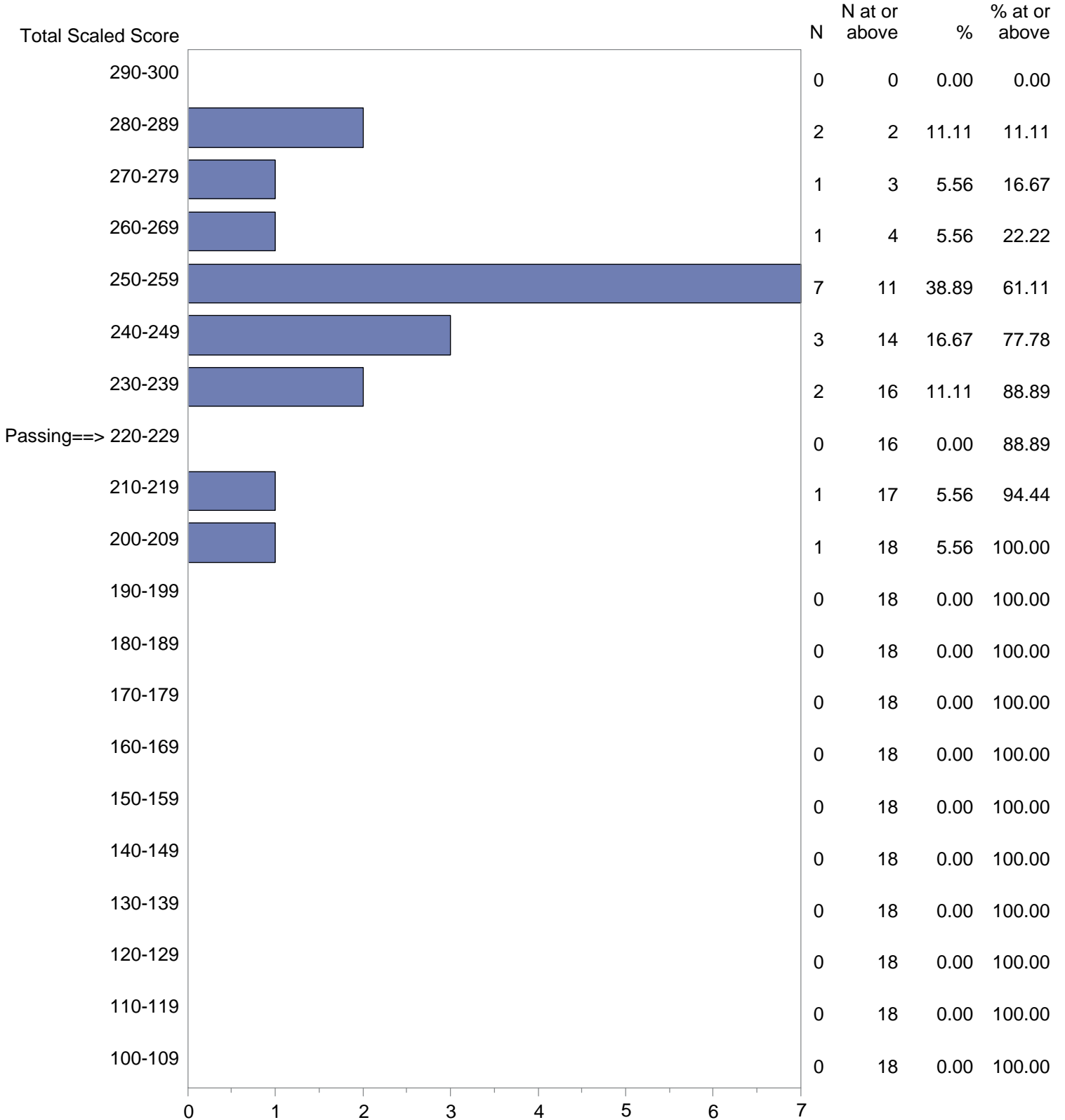
Test Field=English as a Second Language (086)



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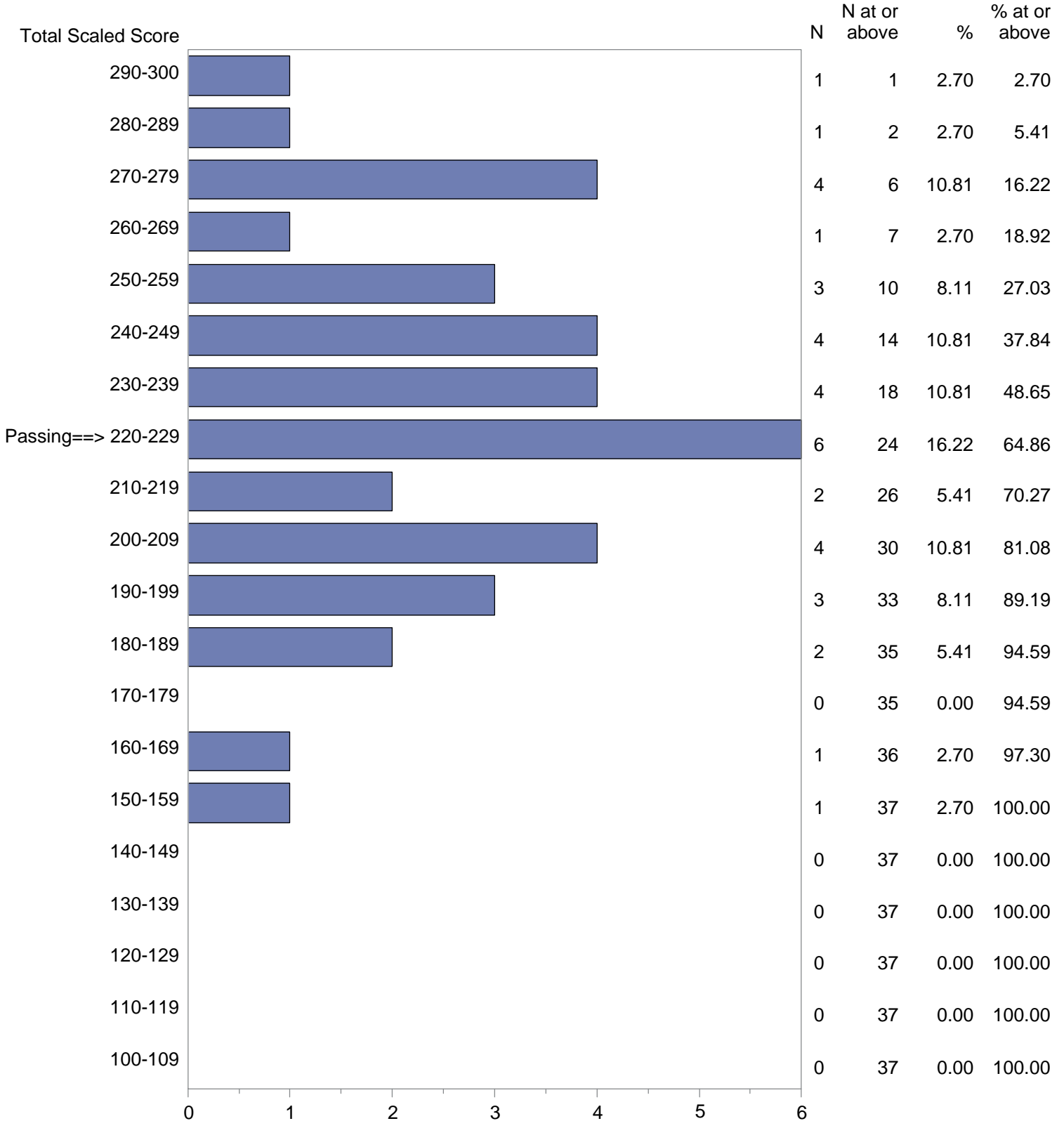
Test Field=Family and Consumer Sciences (040)



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Michigan Test For Teacher Certification (MTTC)
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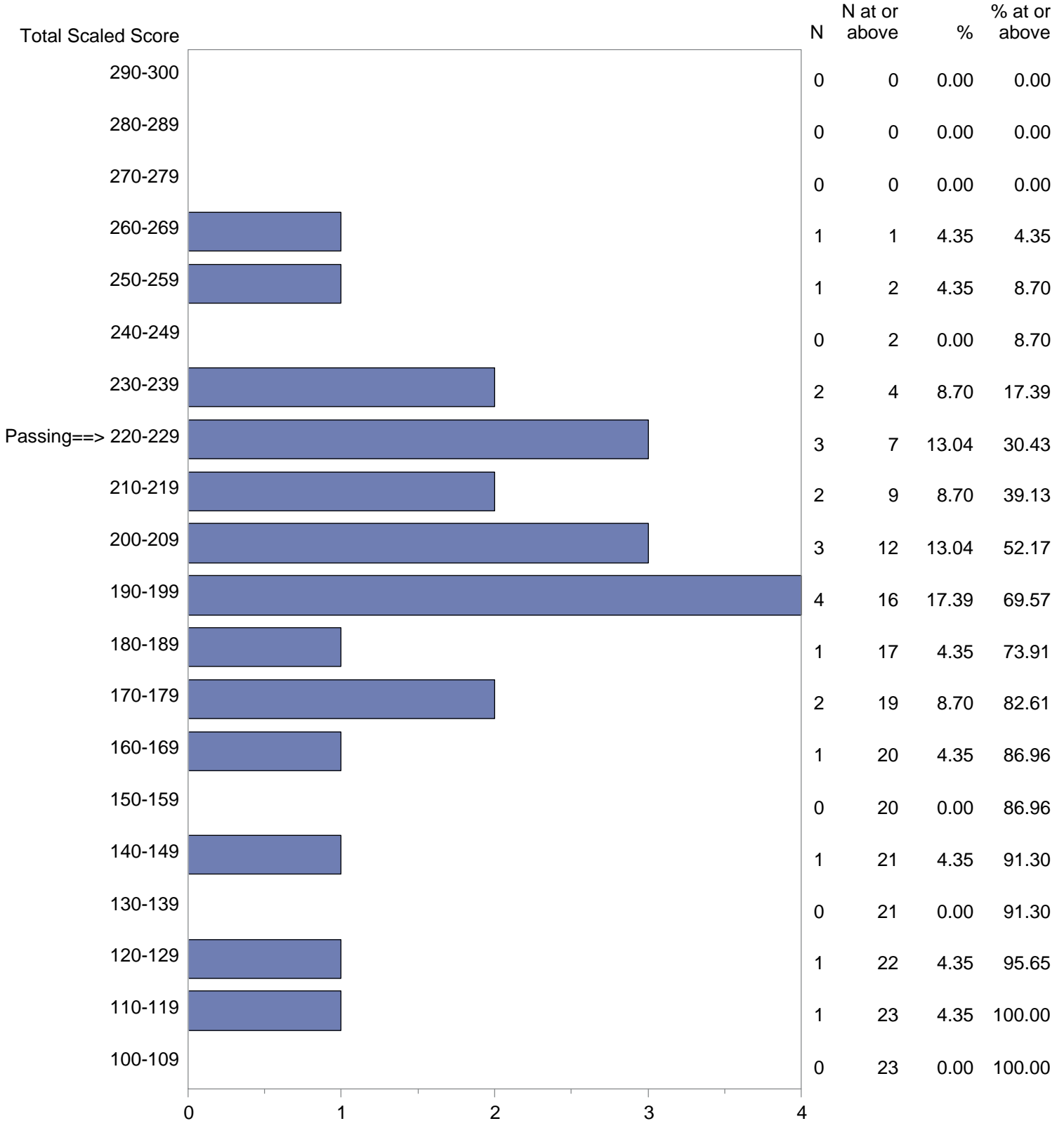
Test Field=French (023)



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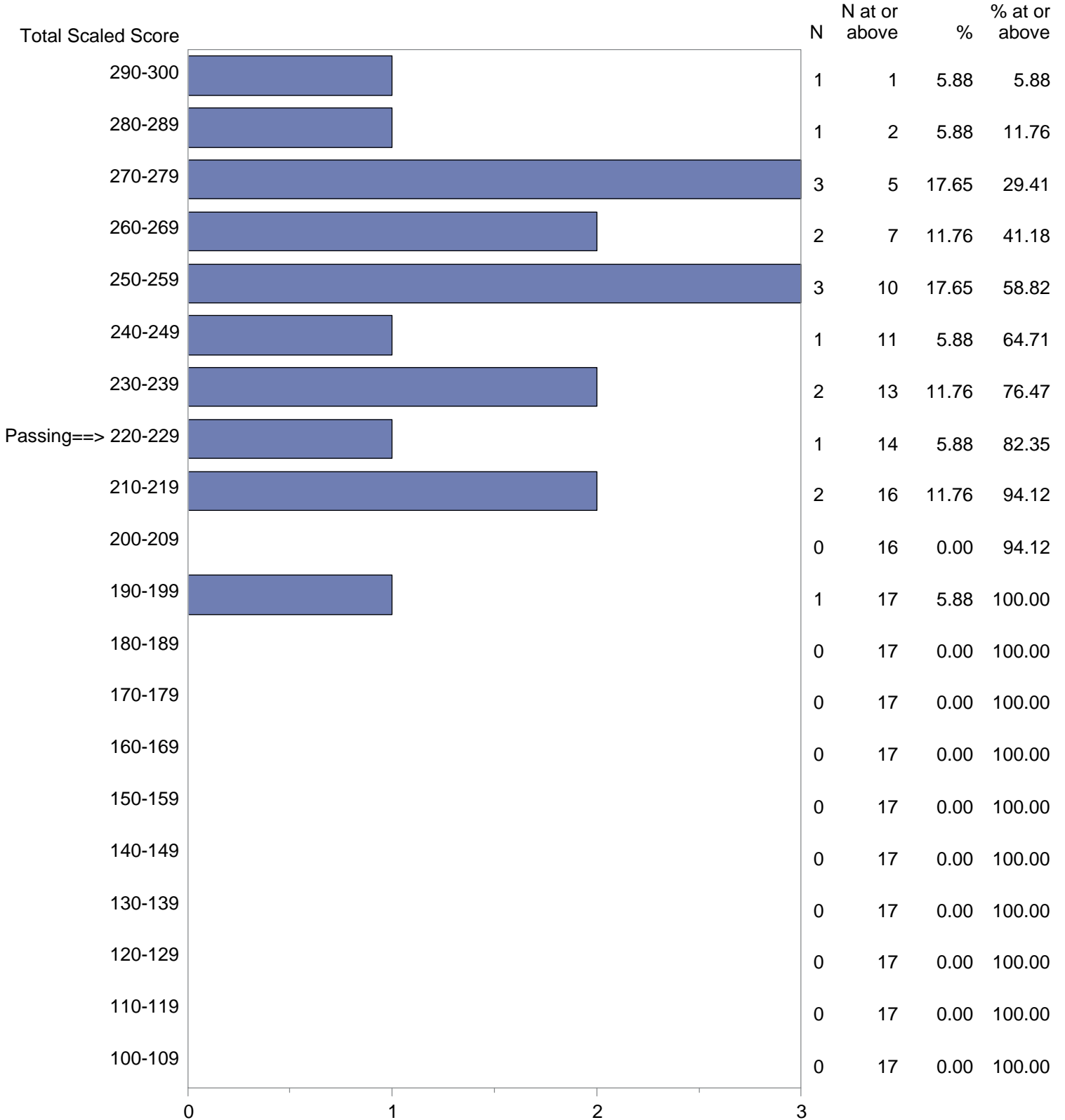
Test Field=Geography (008)



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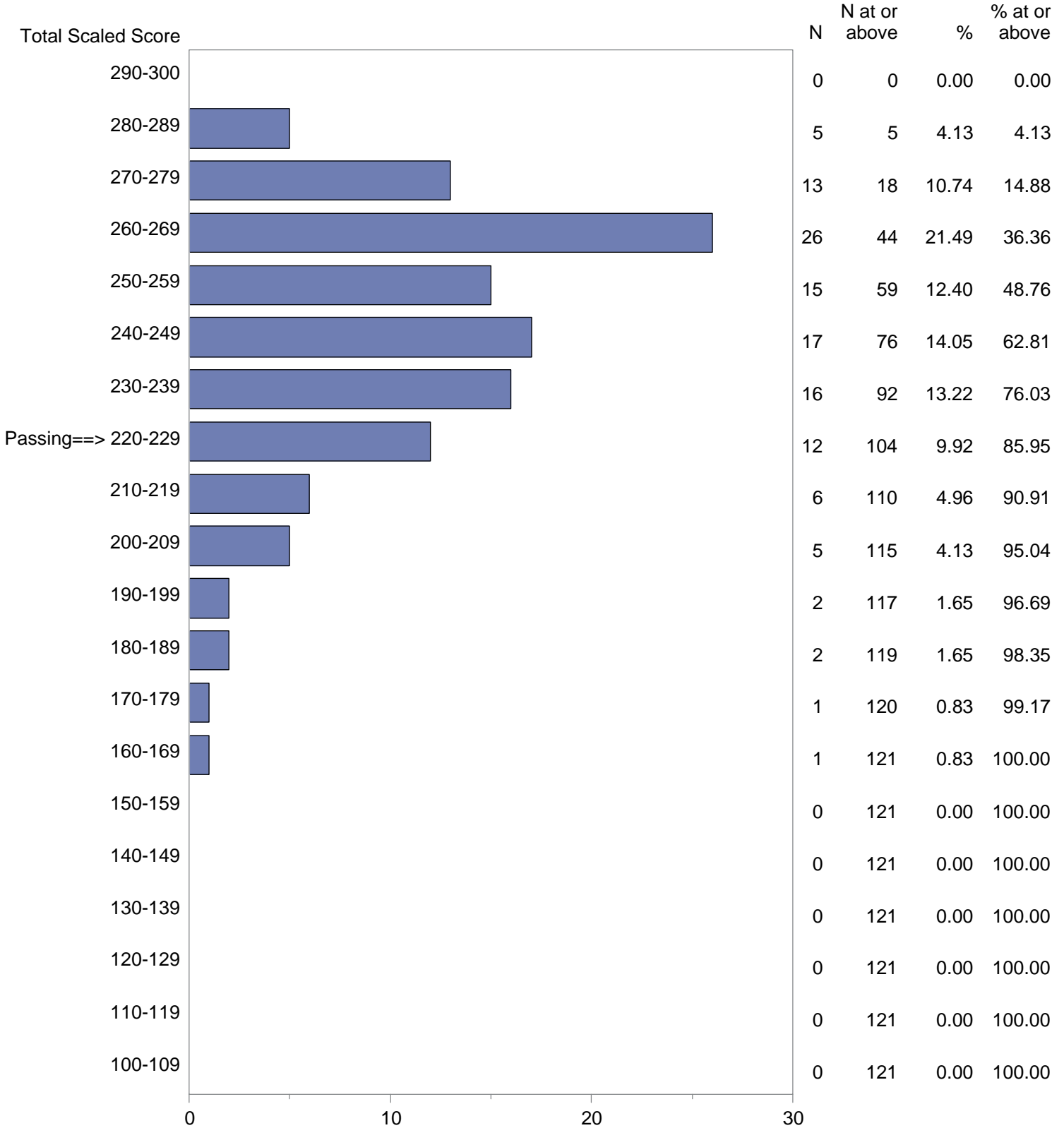
Test Field=German (024)



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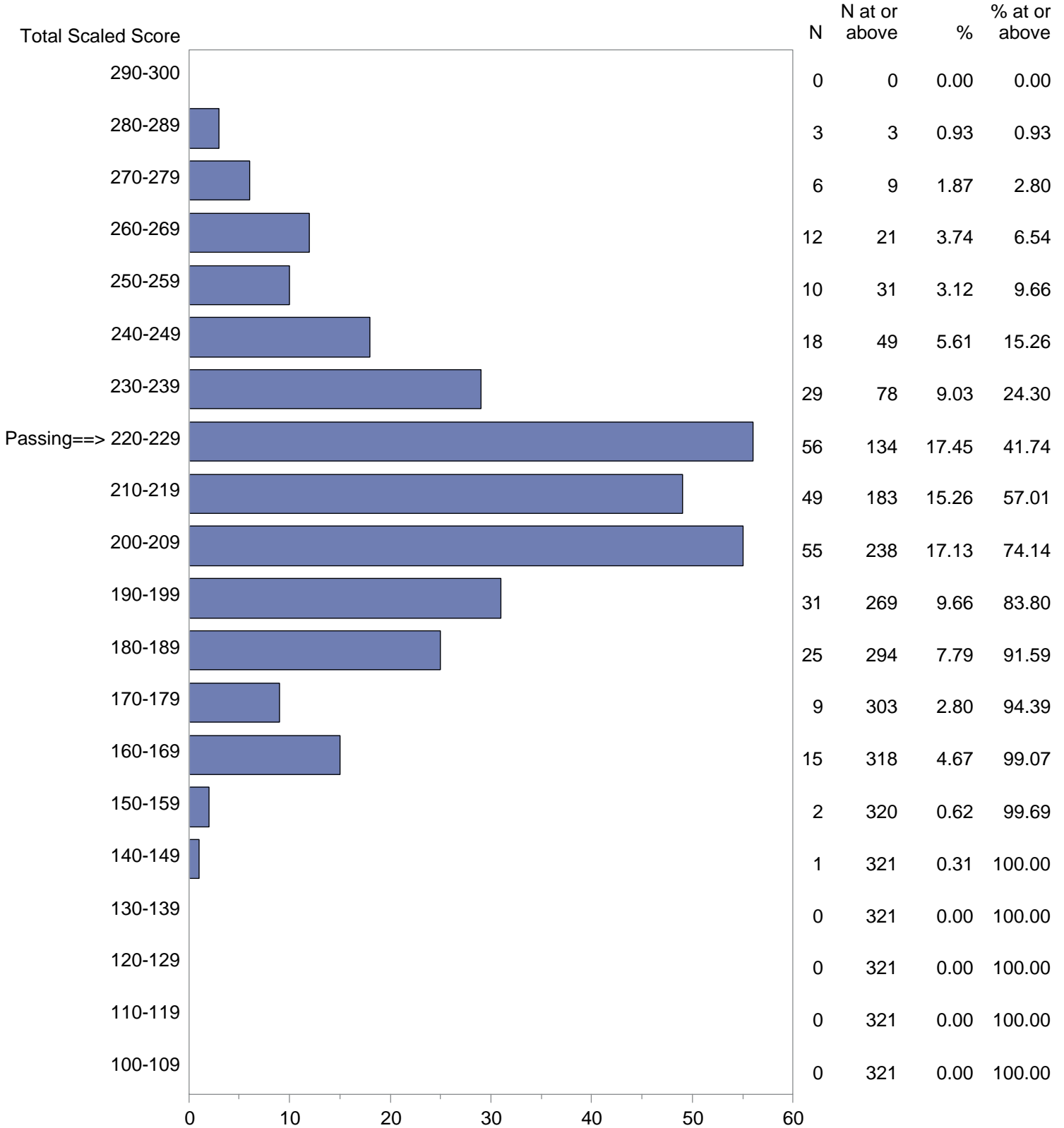
Test Field=Health (043)



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Michigan Test For Teacher Certification (MTTC)
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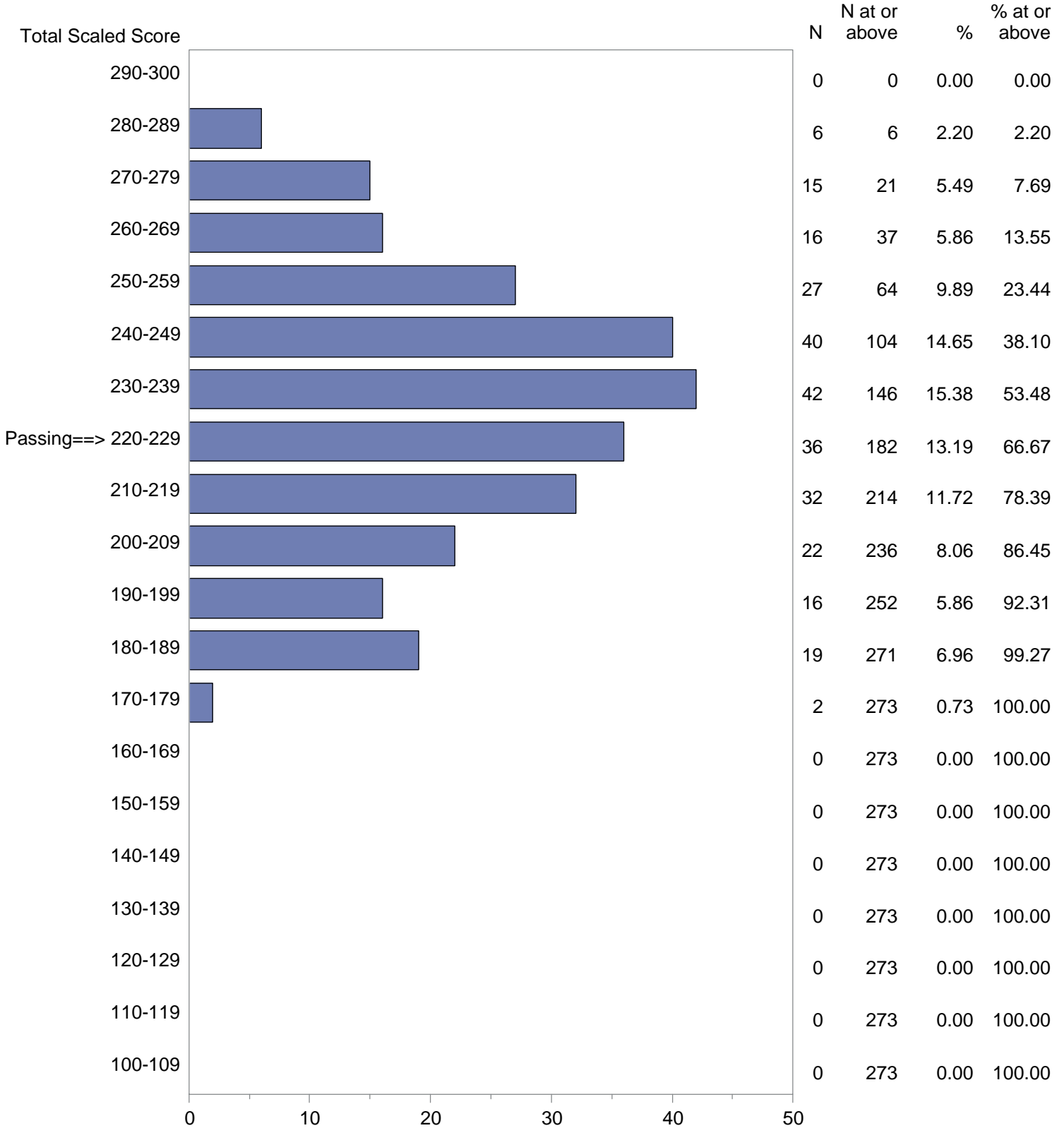
Test Field=History (009)



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Michigan Test For Teacher Certification (MTTC)
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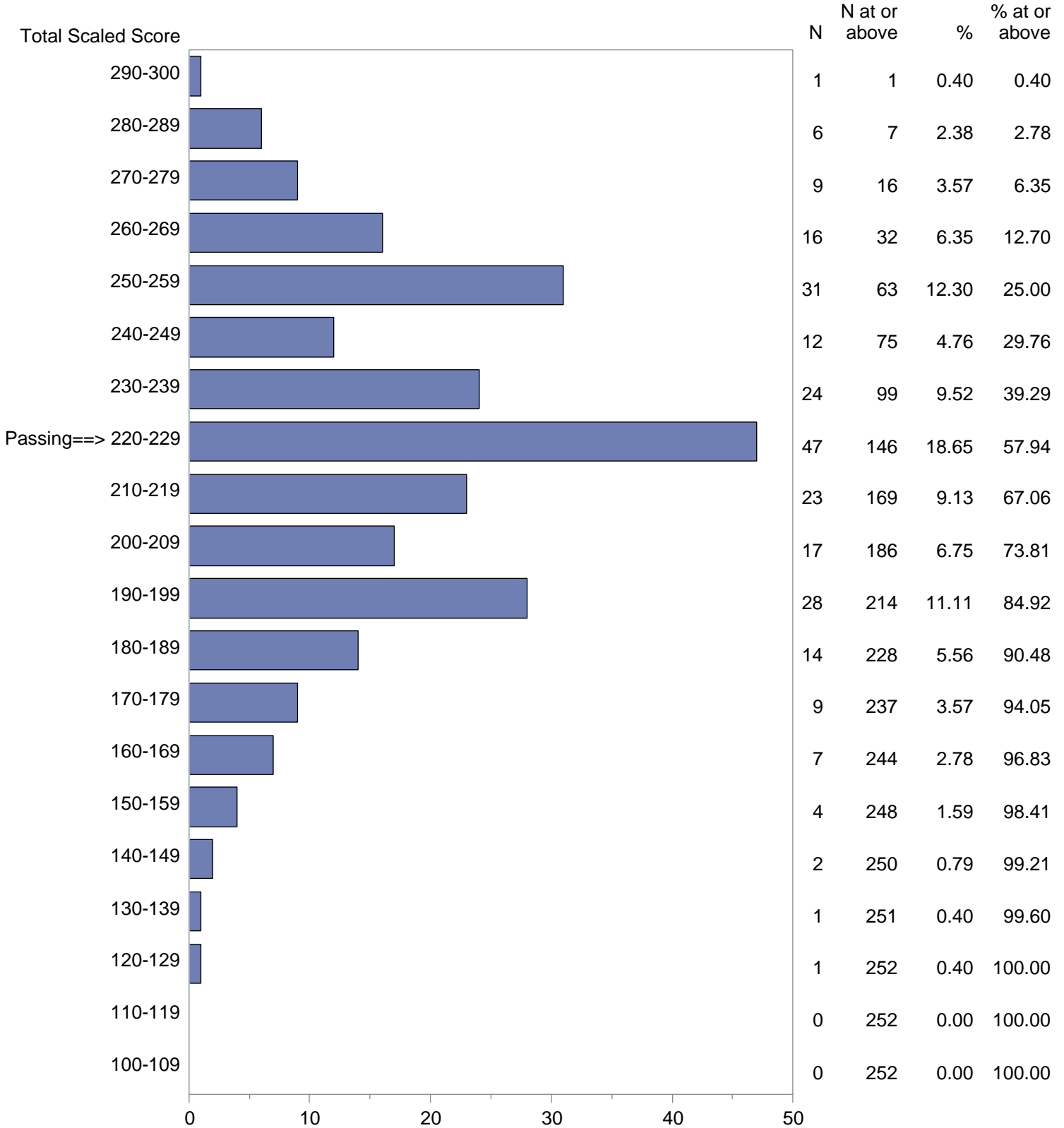
Test Field=Integrated Science (Elementary) (093)



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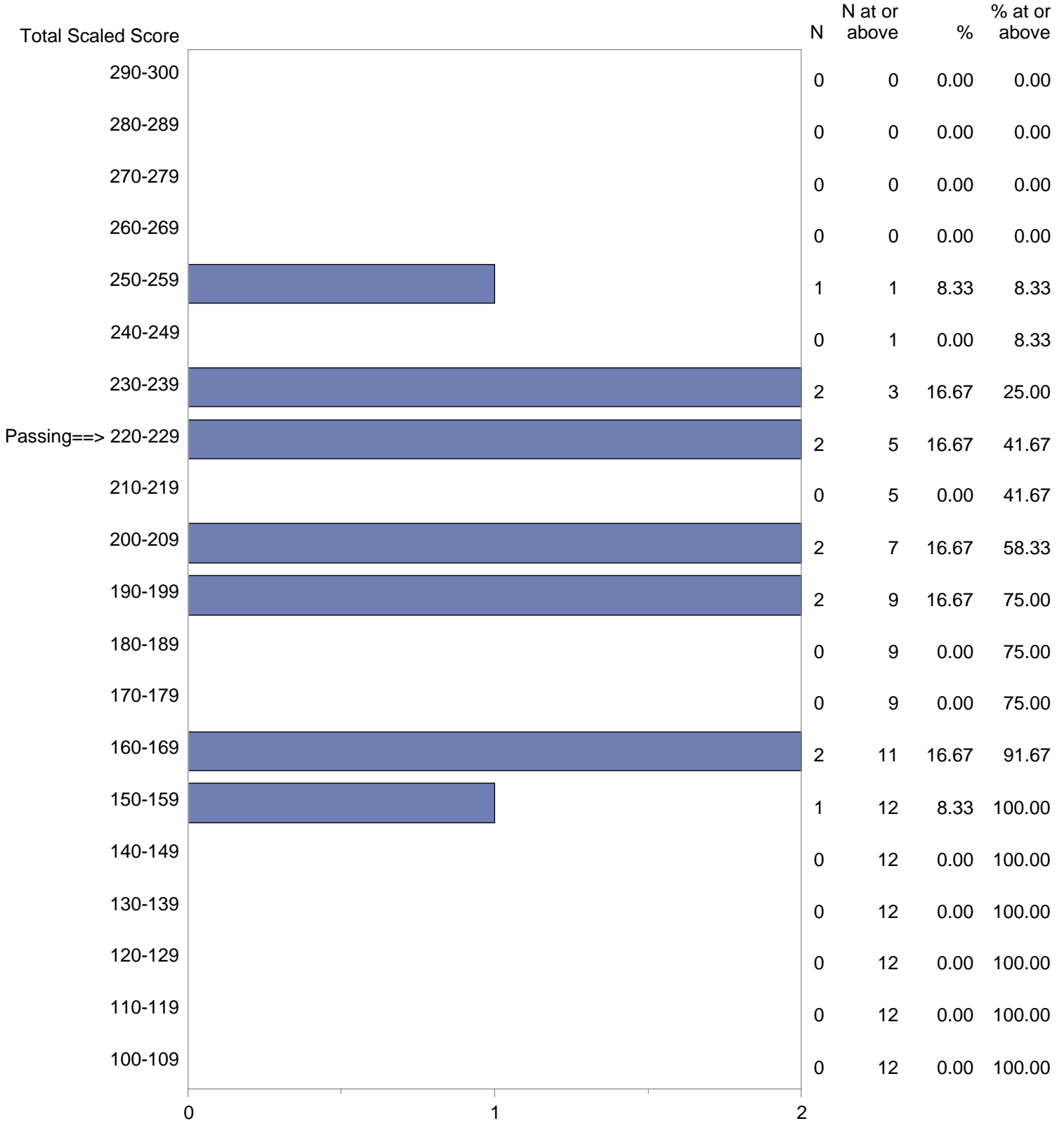
Test Field=Integrated Science (Secondary) (094)



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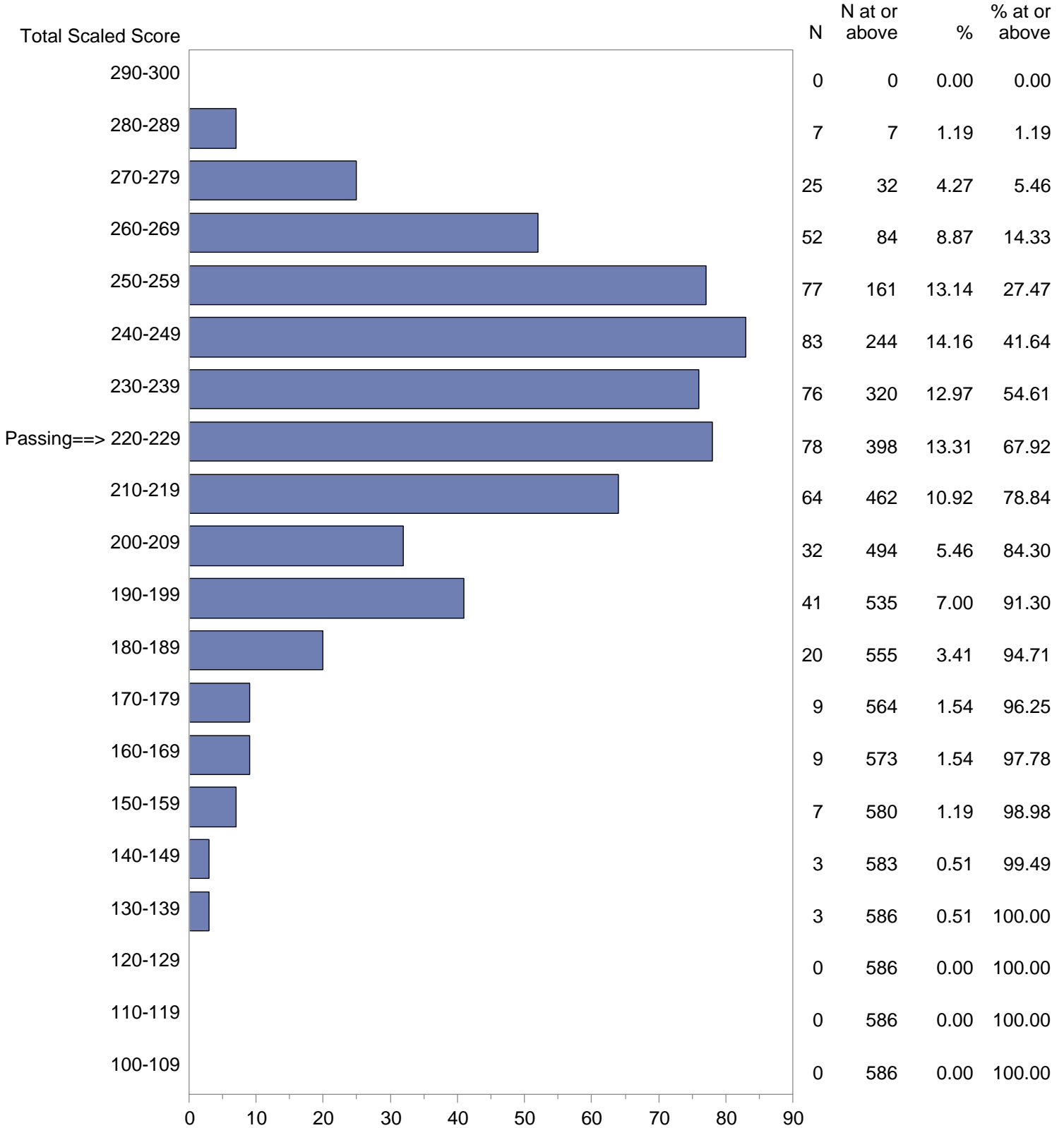
Test Field=Journalism (003)



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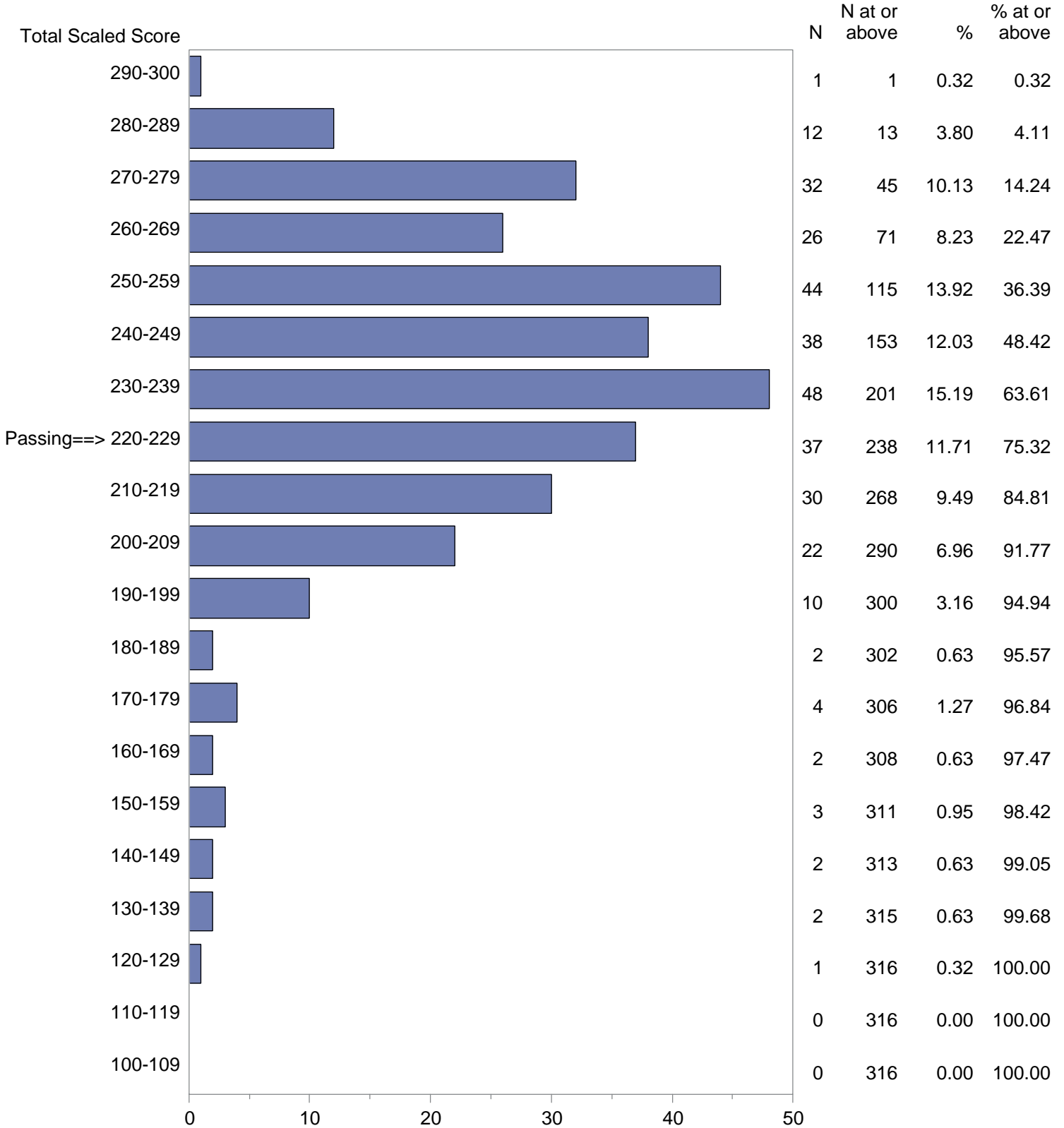
Test Field=Language Arts (Elementary) (090)



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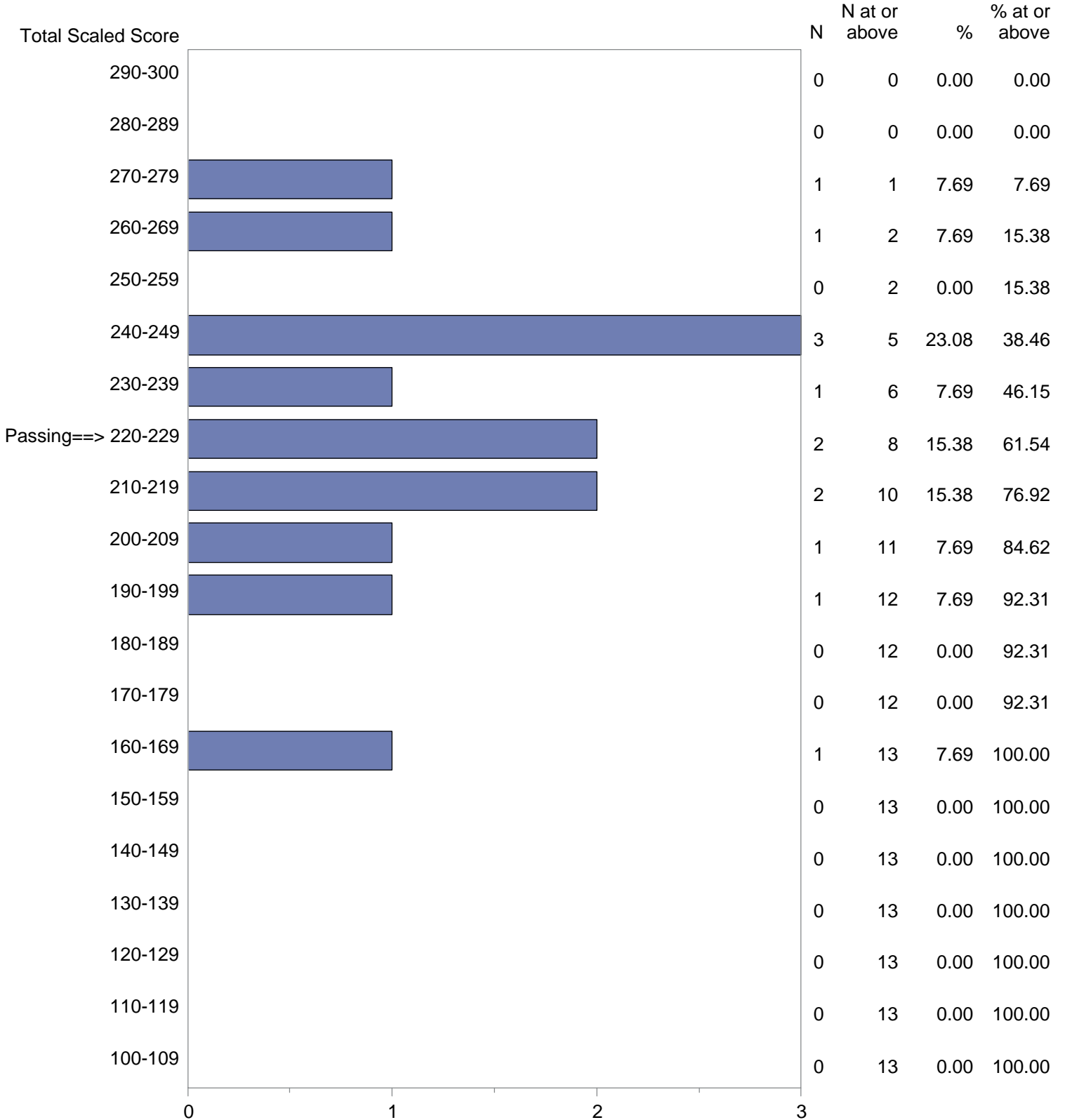
Test Field=Learning Disabilities (063)



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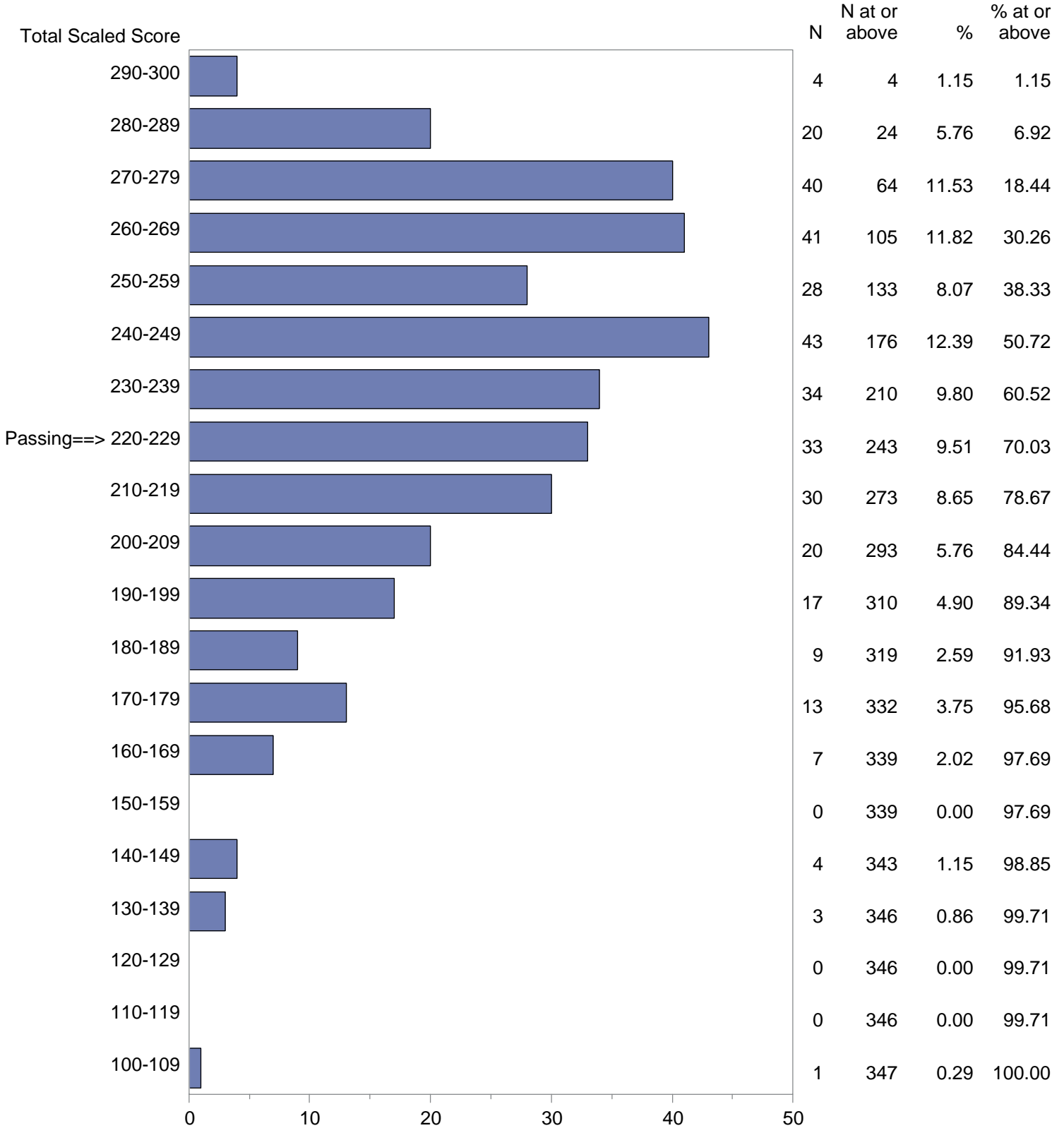
Test Field=Library Media (048)



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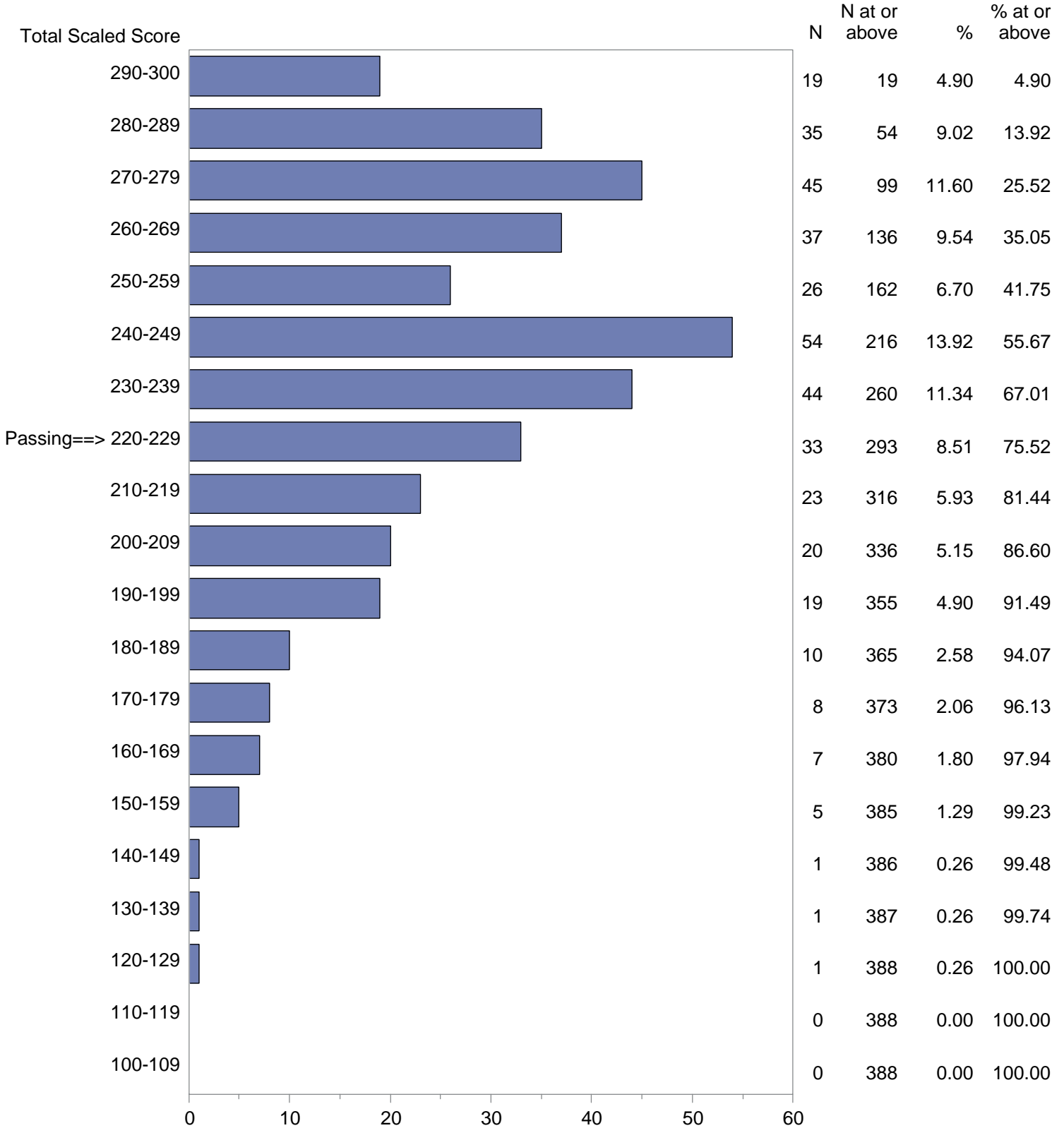
Test Field=Mathematics (Elementary) (089)



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Michigan Test For Teacher Certification (MTTC)
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 Total Scaled Score Distribution by Test Field (All Forms)

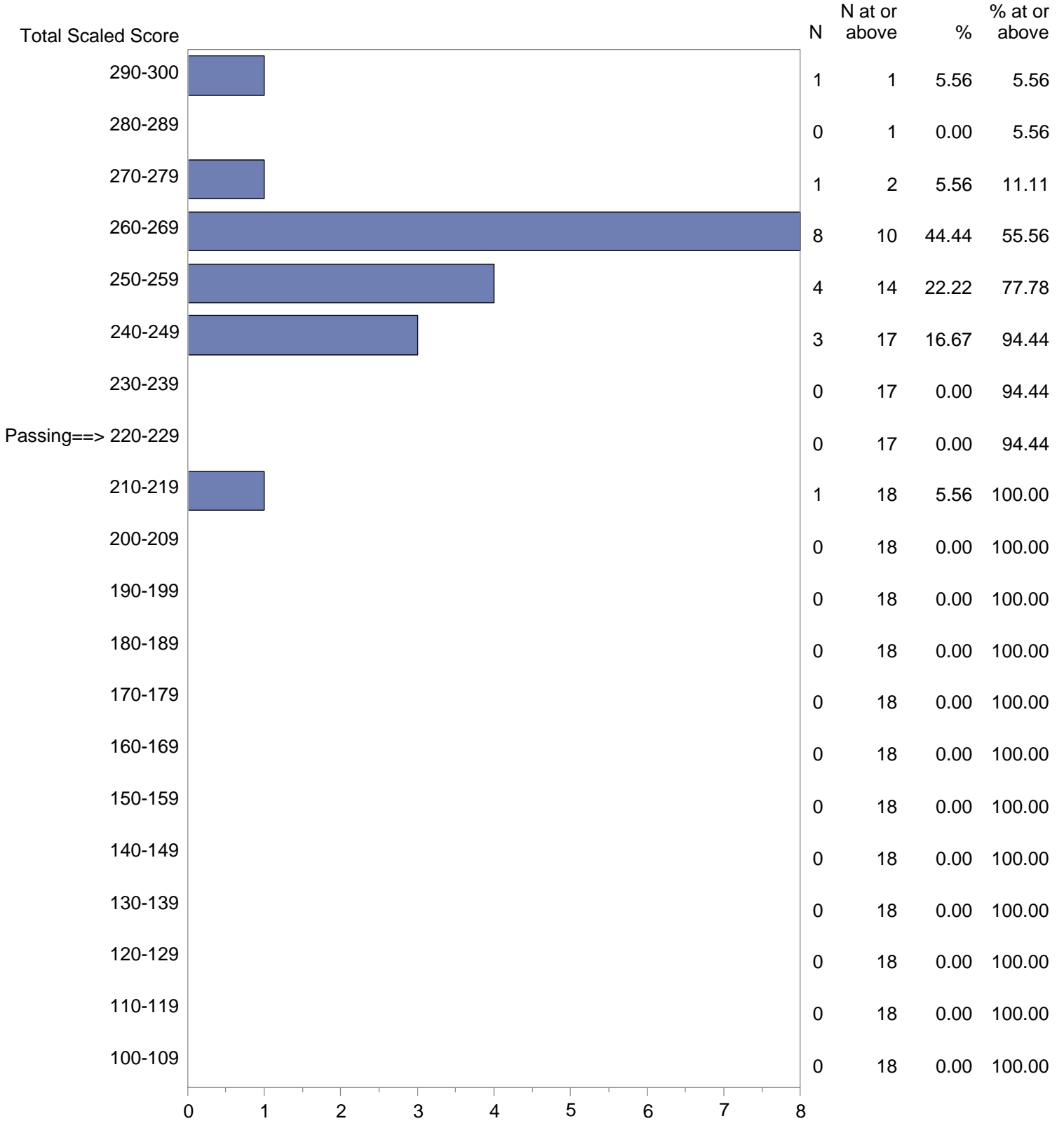
Test Field=Mathematics (Secondary) (022)



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Michigan Test For Teacher Certification (MTTC)
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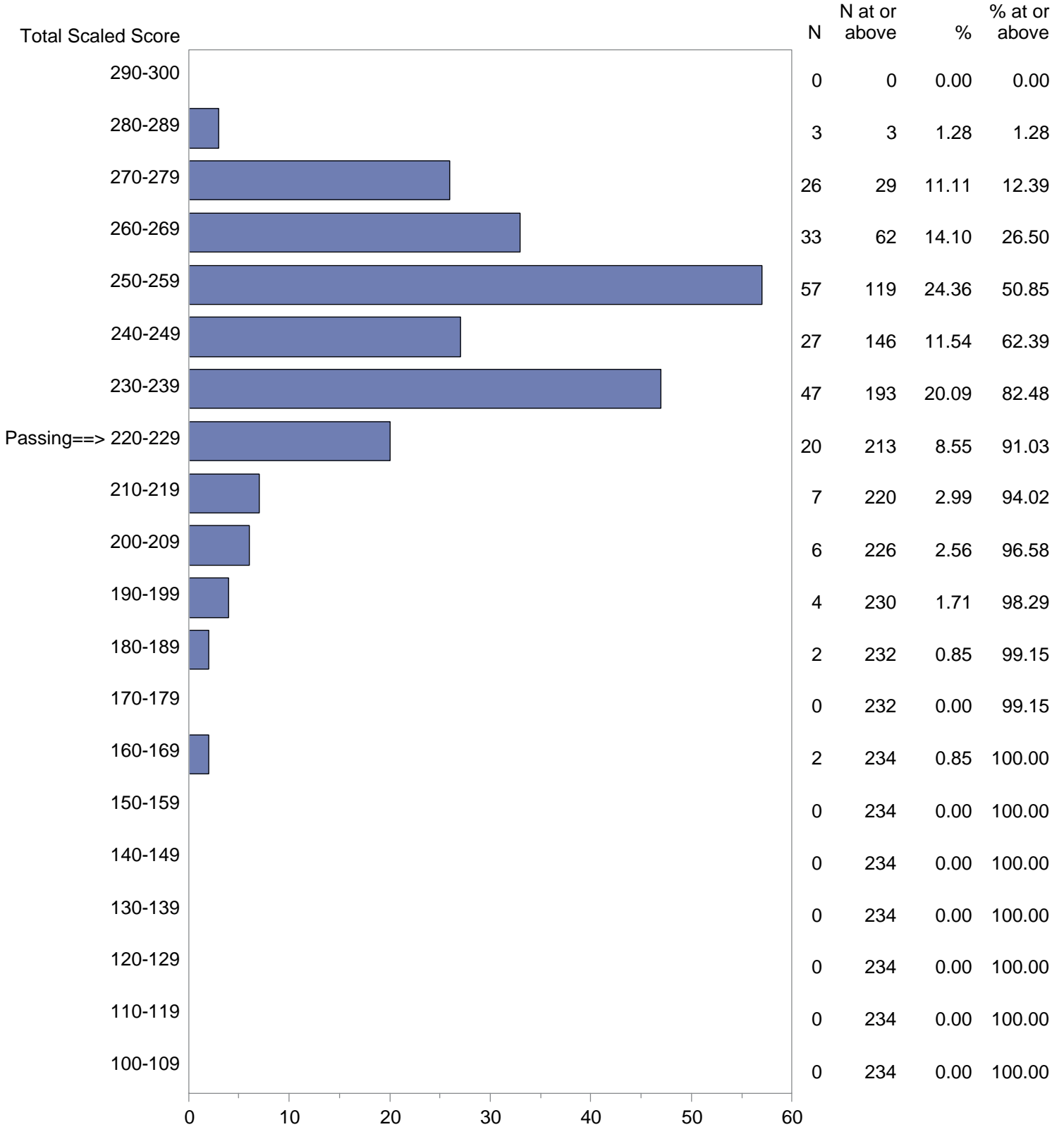
Test Field=Middle Level (085)



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Michigan Test For Teacher Certification (MTTC)
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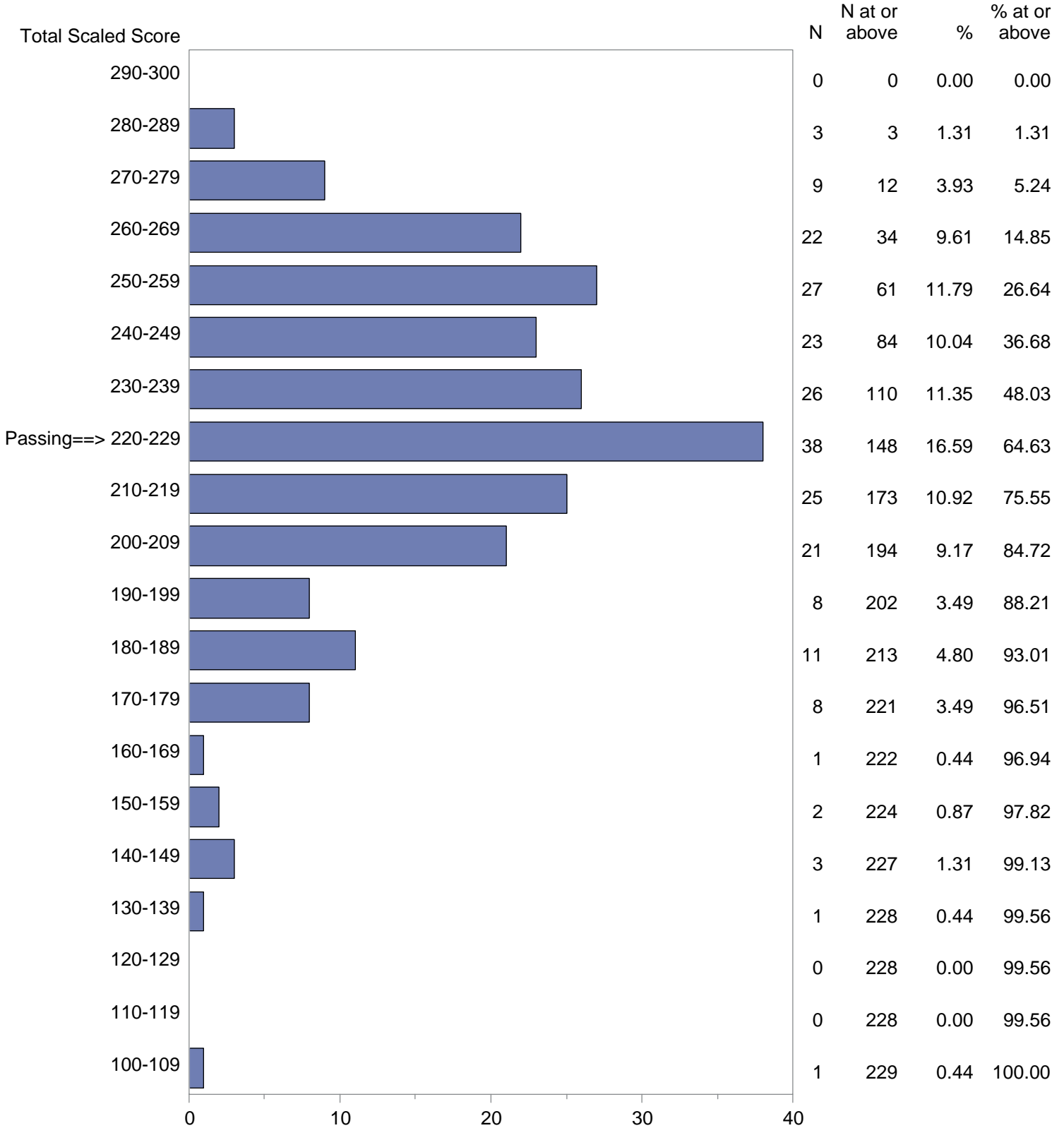
Test Field=Music Education (099)



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Michigan Test For Teacher Certification (MTTC)
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 Total Scaled Score Distribution by Test Field (All Forms)

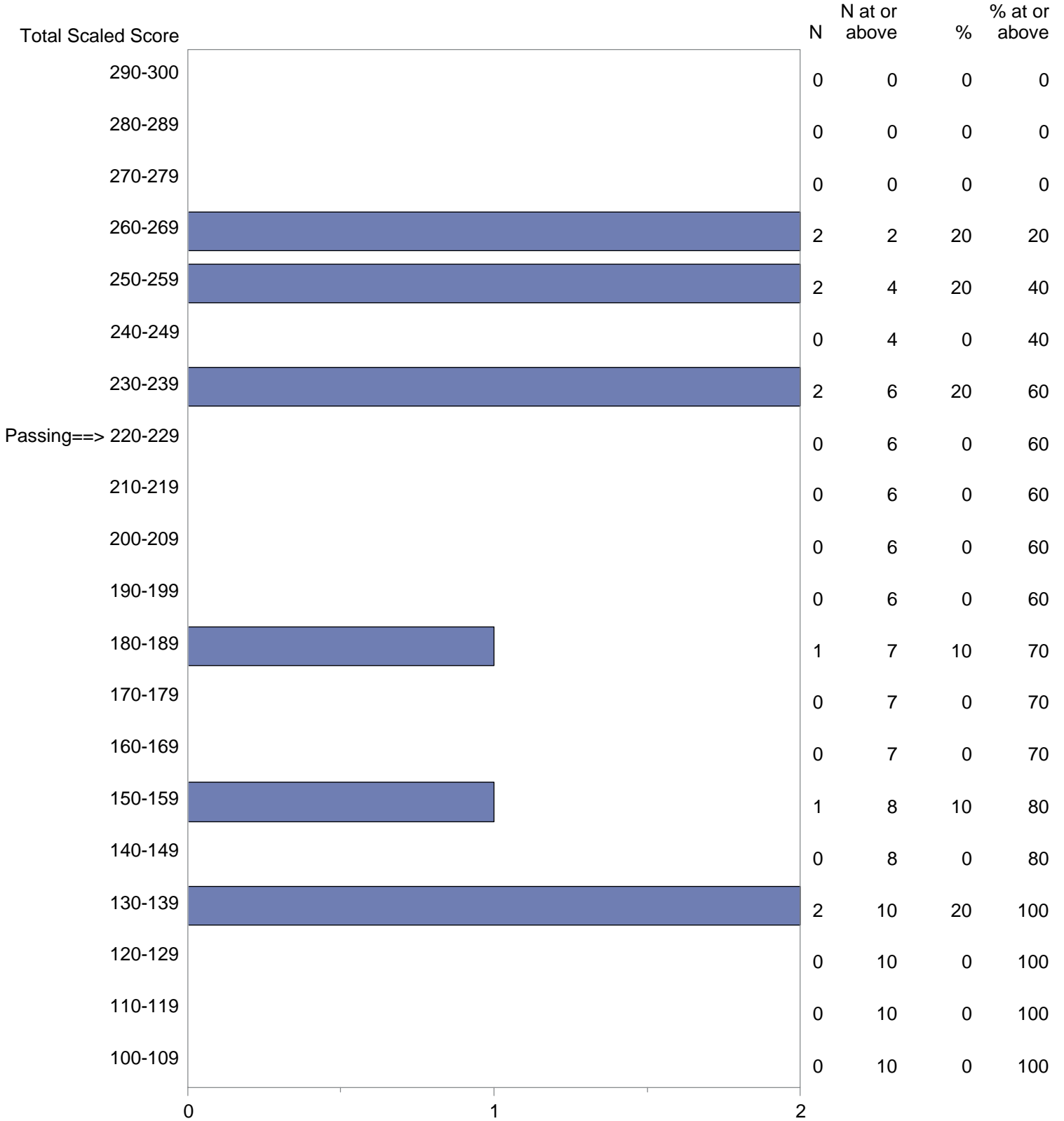
Test Field=Physical Education (044)



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Michigan Test For Teacher Certification (MTTC)
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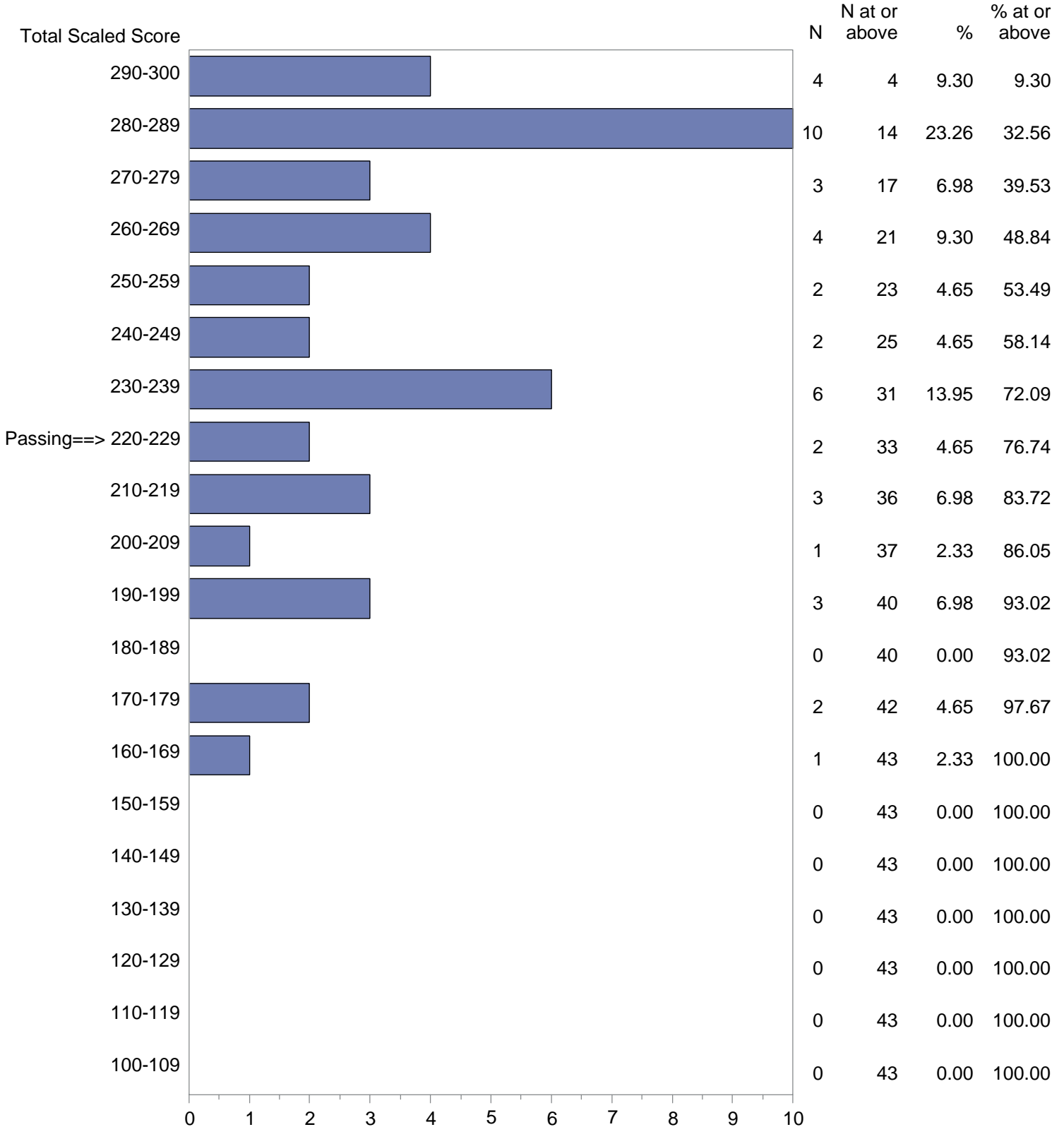
Test Field=Physical Science (097)



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Michigan Test For Teacher Certification (MTTC)
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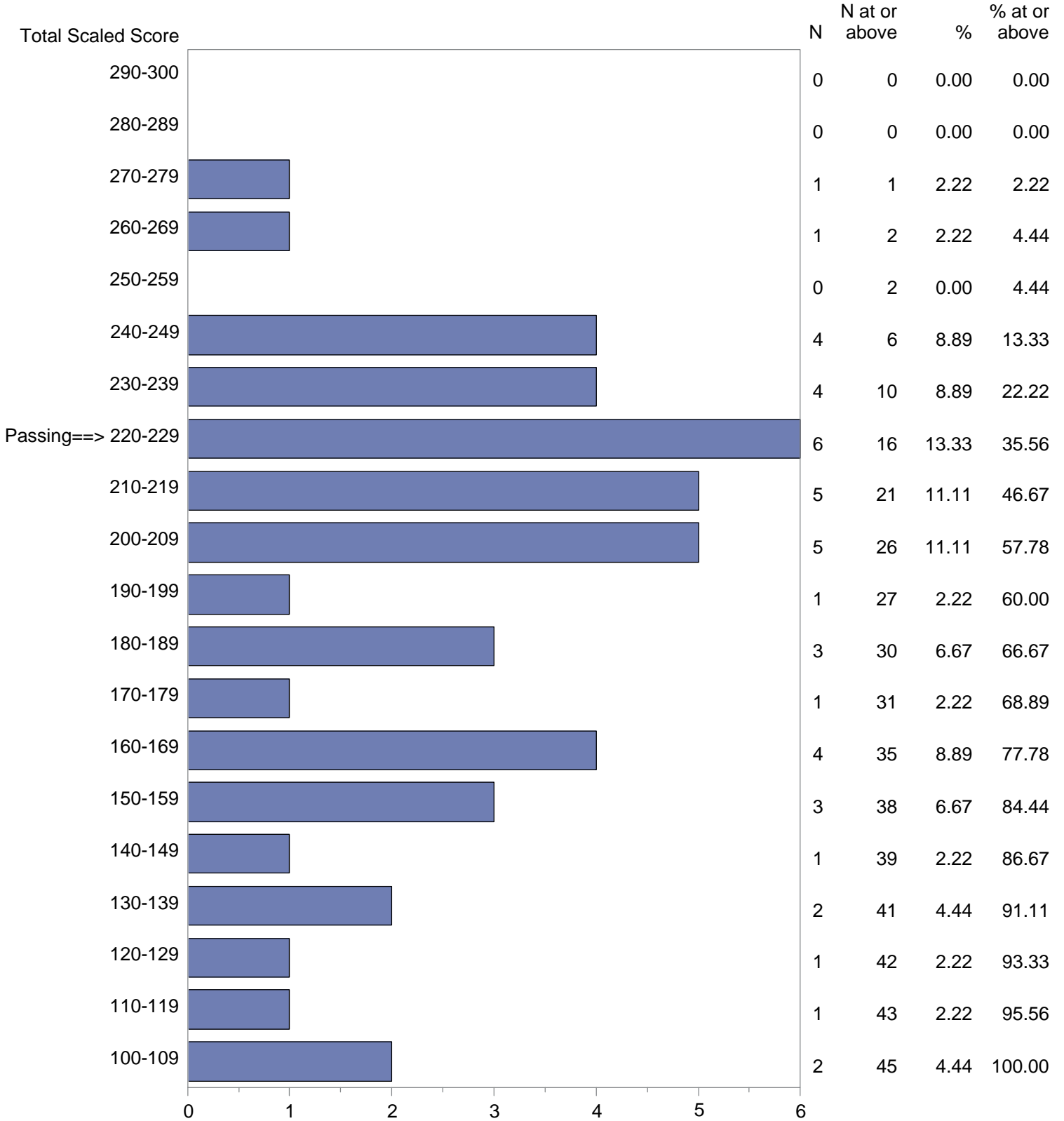
Test Field=Physics (019)



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Michigan Test For Teacher Certification (MTTC)
 October 1, 2017 - September 30, 2018
 Total Scaled Score Distribution by Test Field (All Forms)

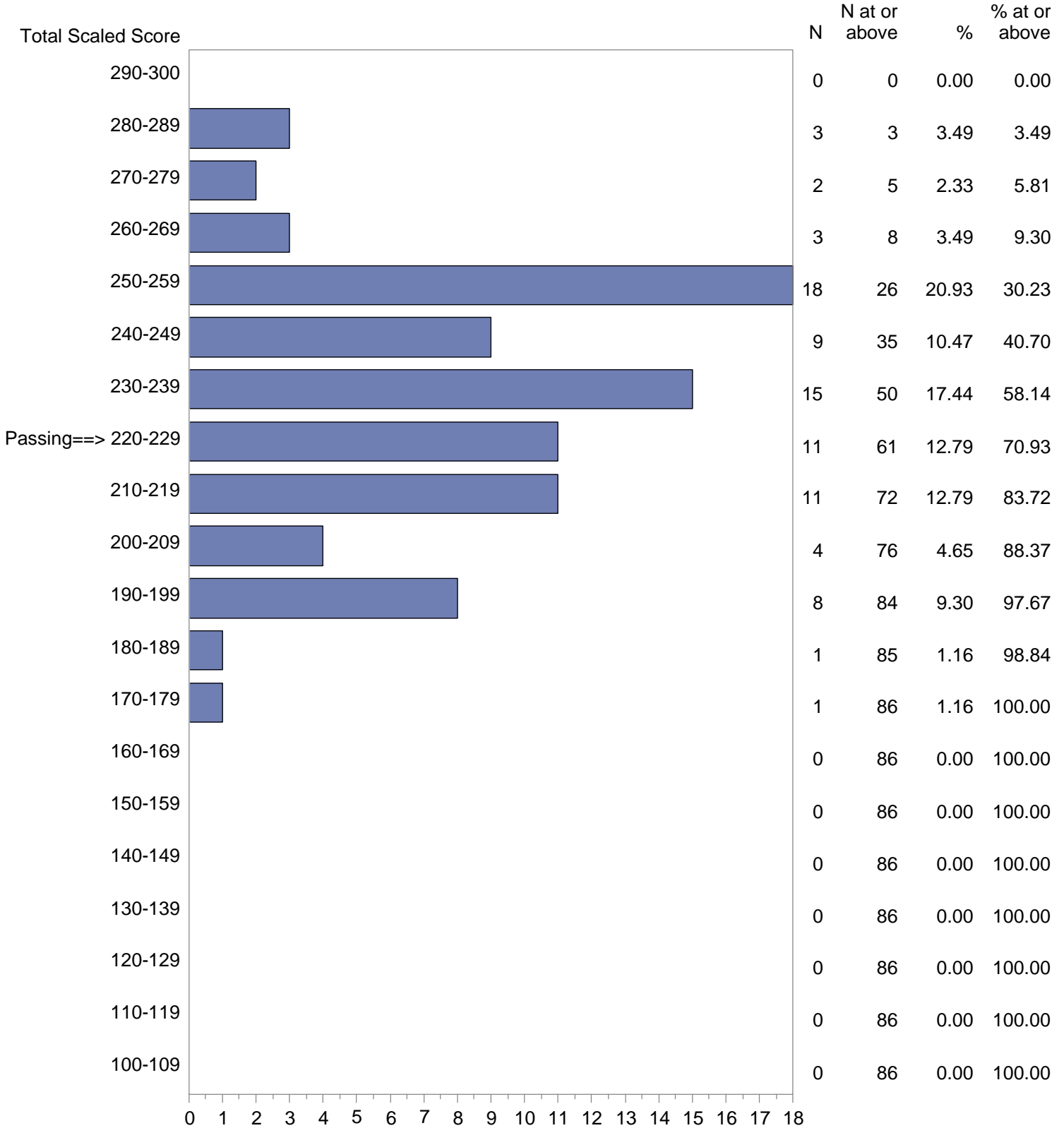
Test Field=Political Science (010)



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 October 1, 2017 - September 30, 2018
 Total Scaled Score Distribution by Test Field (All Forms)

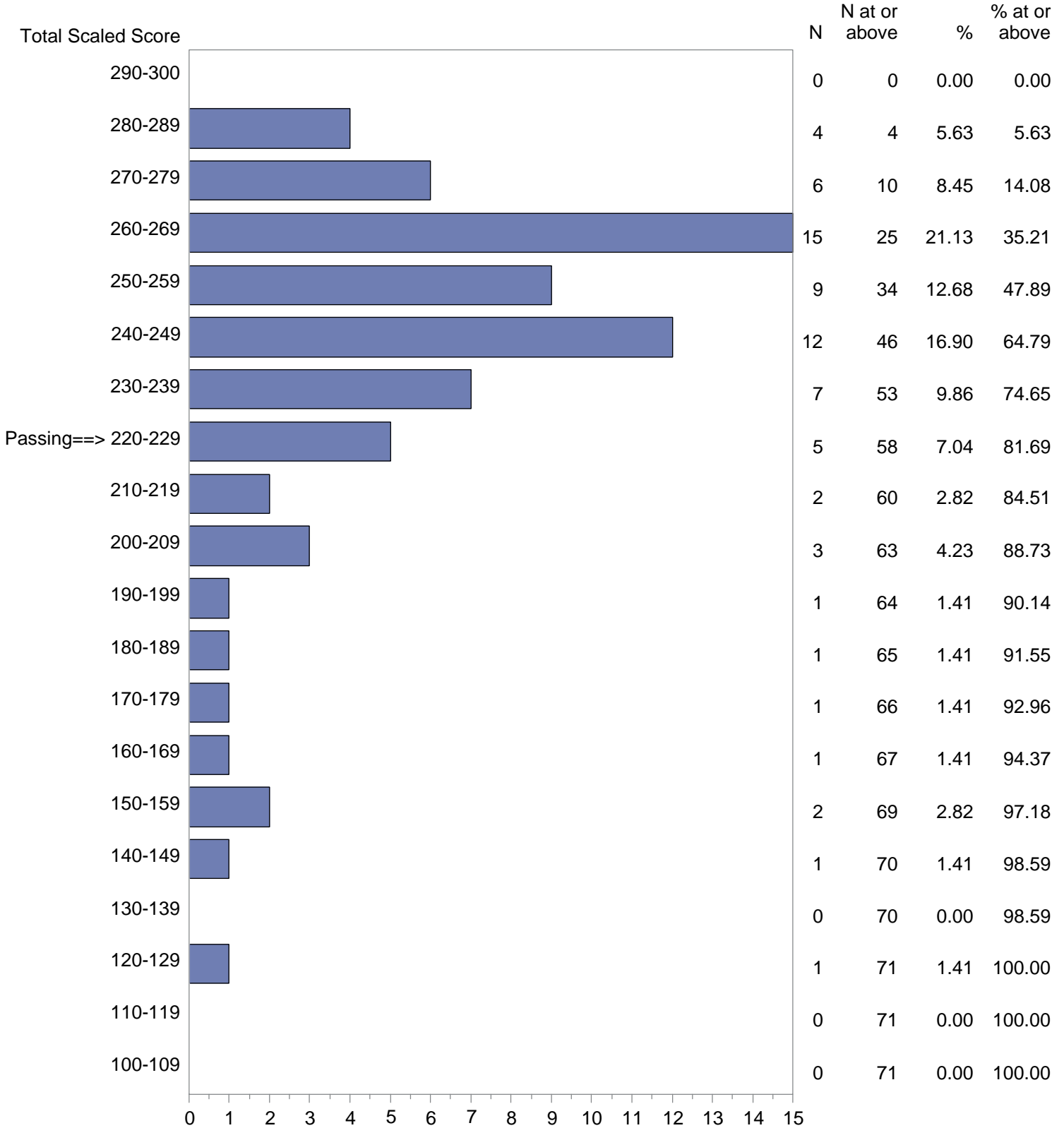
Test Field=Psychology (011)



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 Total Scaled Score Distribution by Test Field (All Forms)

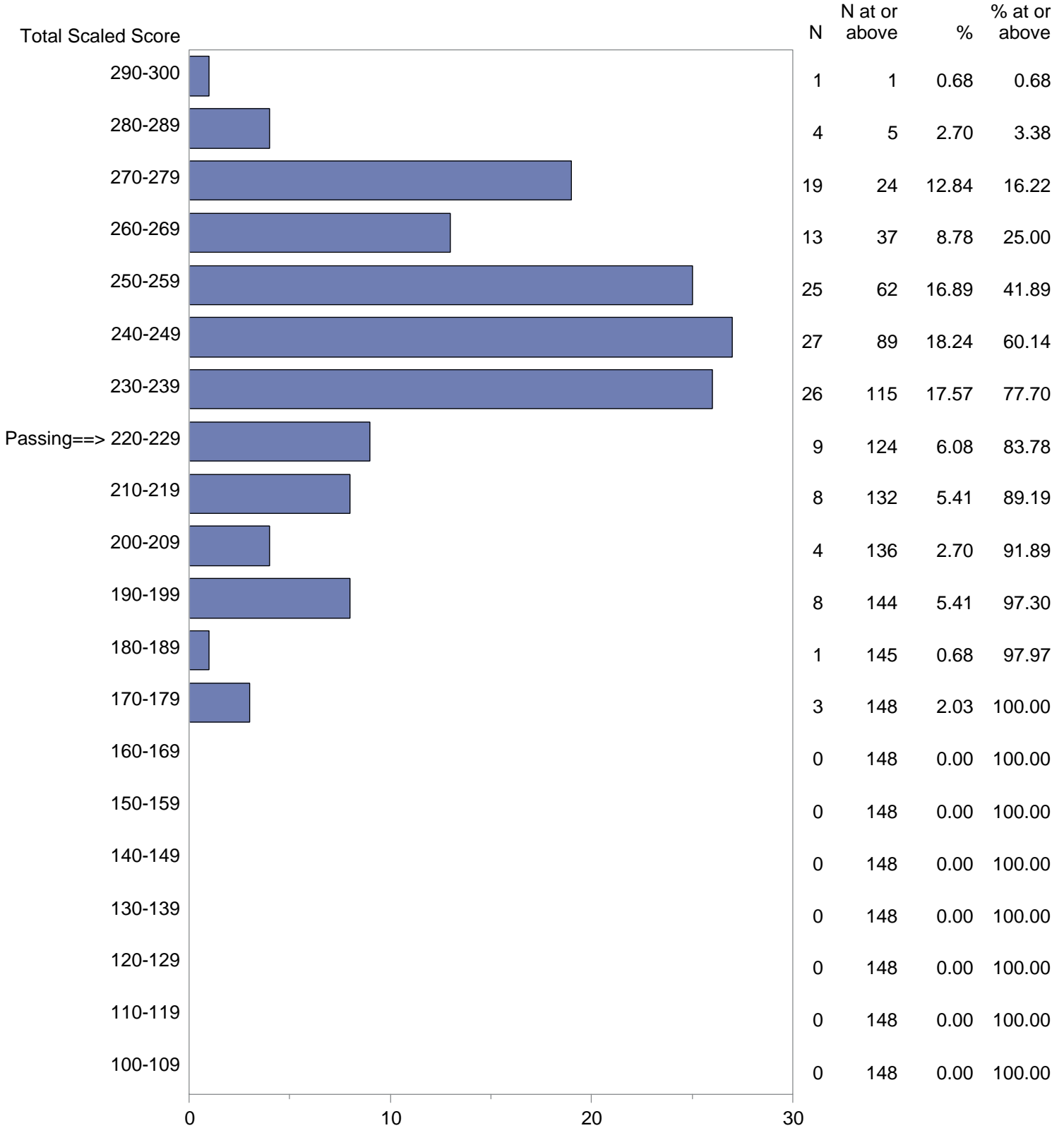
Test Field=Reading (005)



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 Total Scaled Score Distribution by Test Field (All Forms)

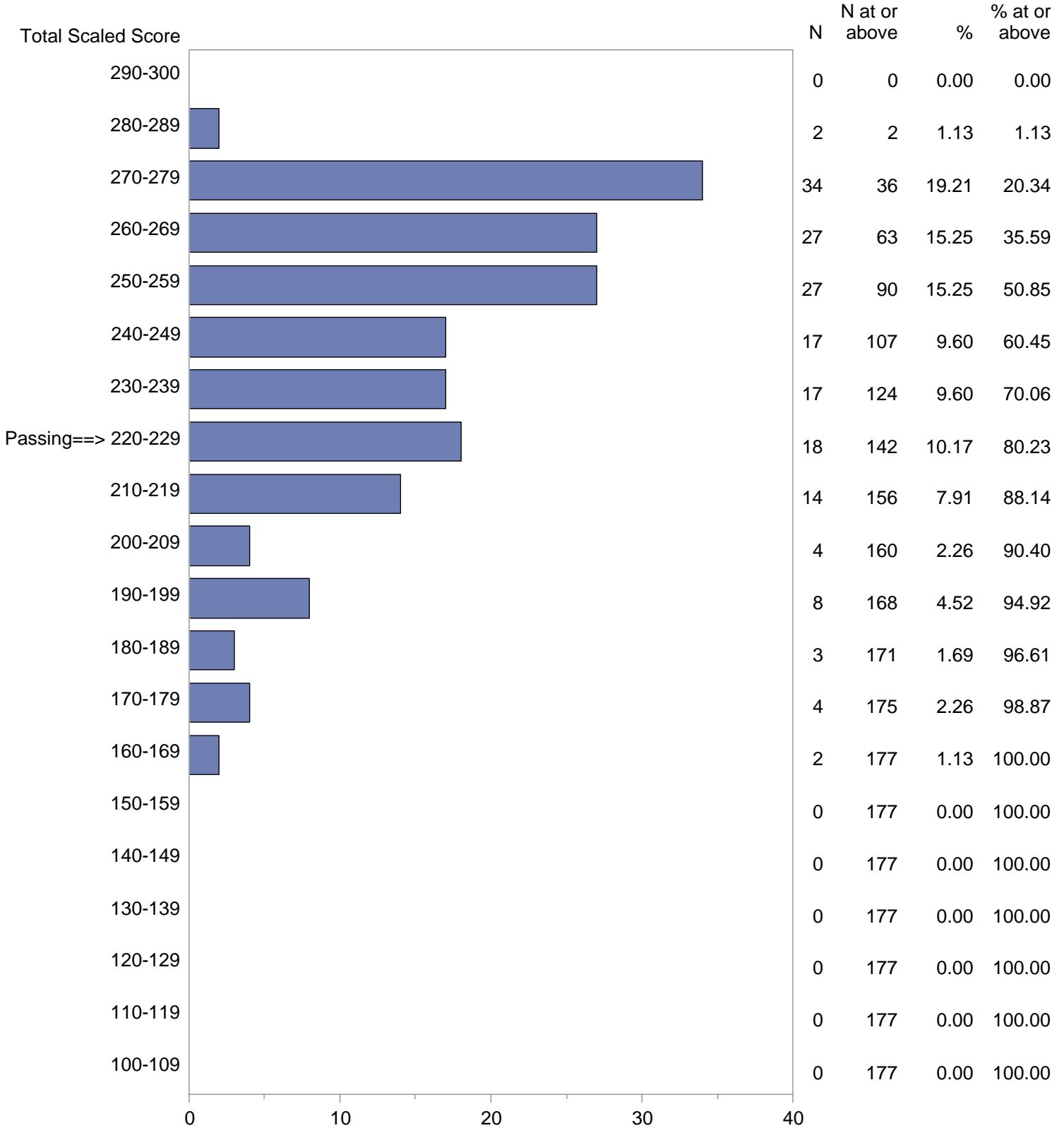
Test Field=Reading Specialist (092)



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 Total Scaled Score Distribution by Test Field (All Forms)

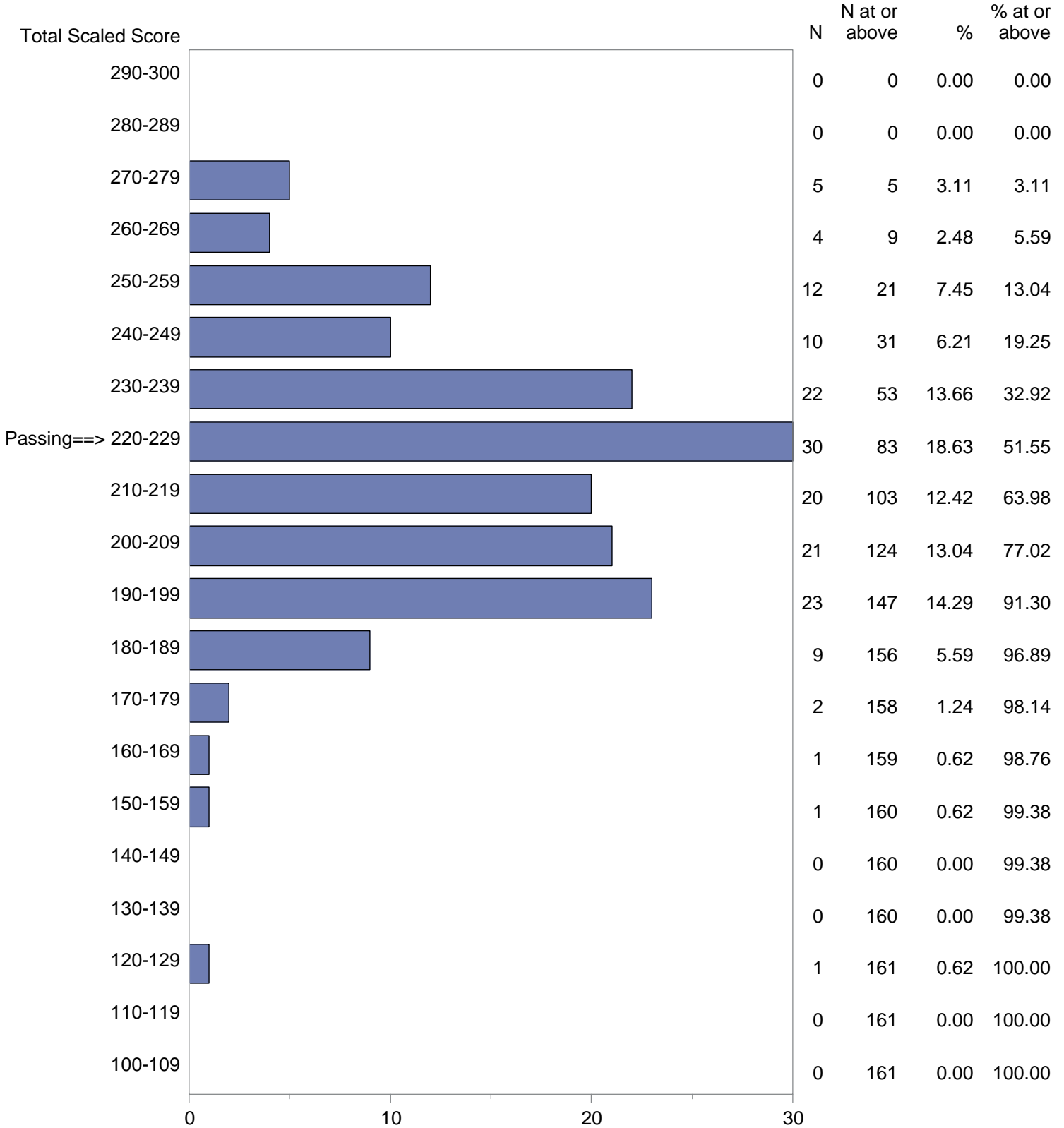
Test Field=School Counselor (051)



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 Total Scaled Score Distribution by Test Field (All Forms)

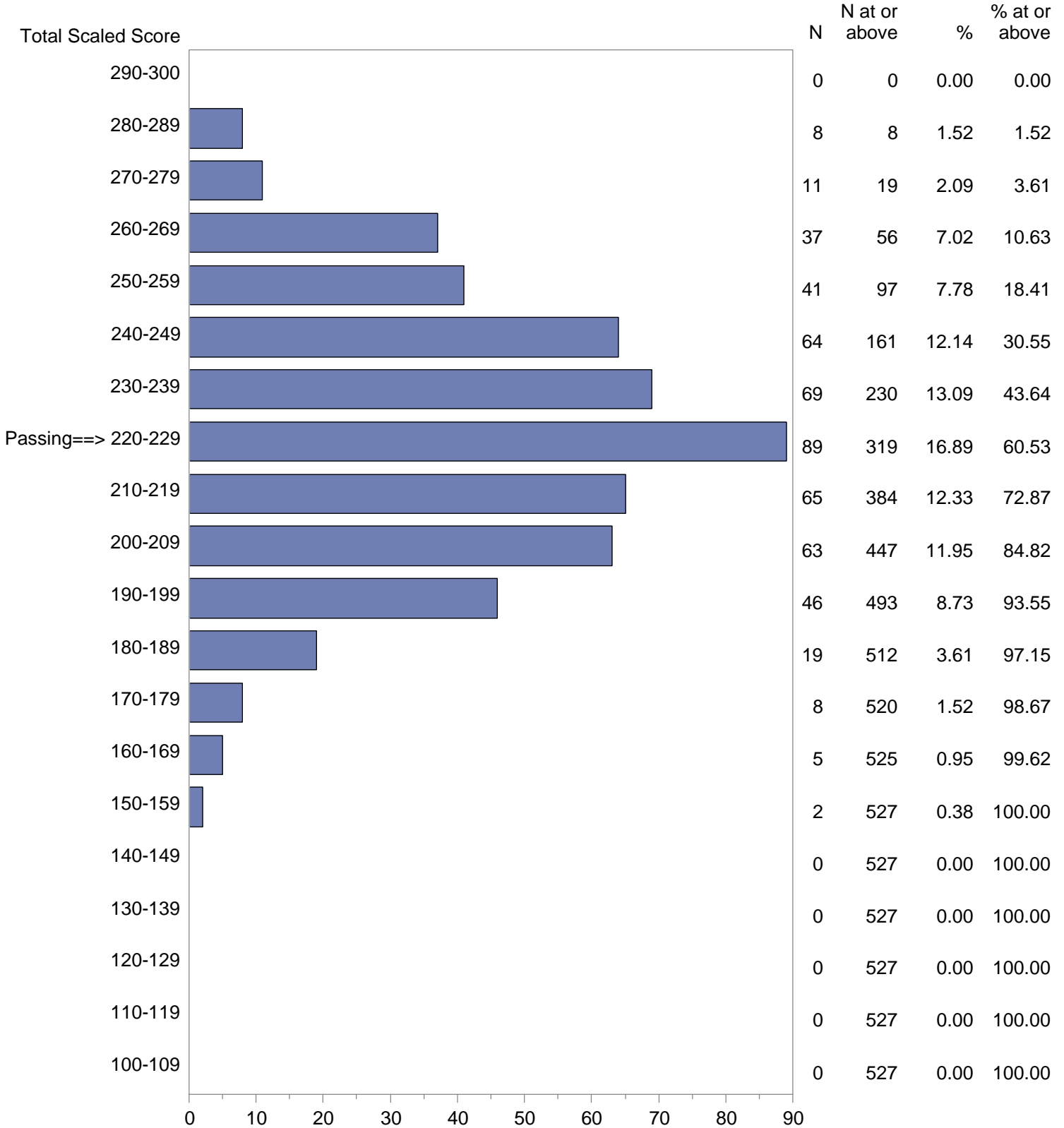
Test Field=Social Studies (Elementary) (105)



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 Total Scaled Score Distribution by Test Field (All Forms)

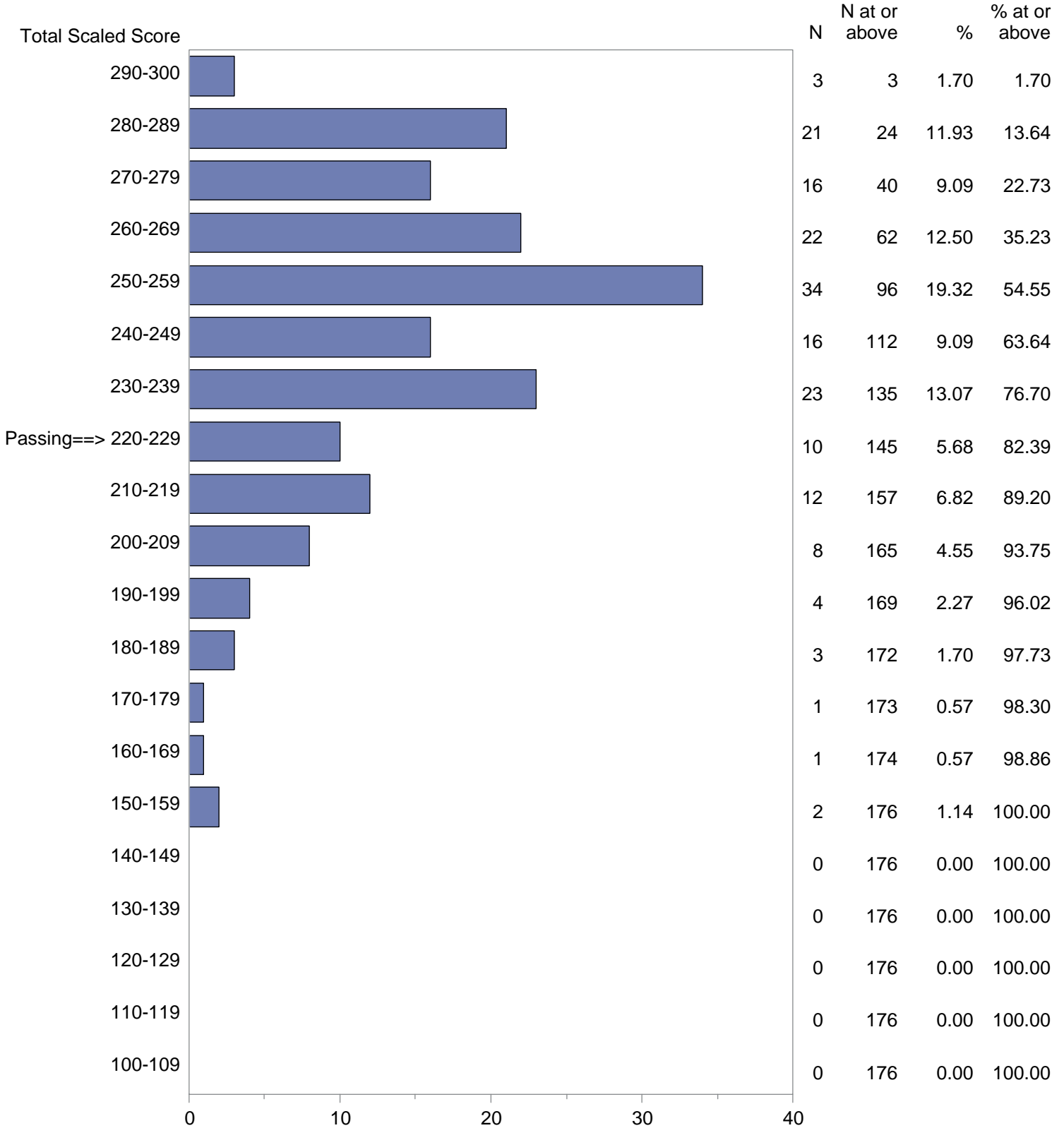
Test Field=Social Studies (Secondary) (084)



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 Total Scaled Score Distribution by Test Field (All Forms)

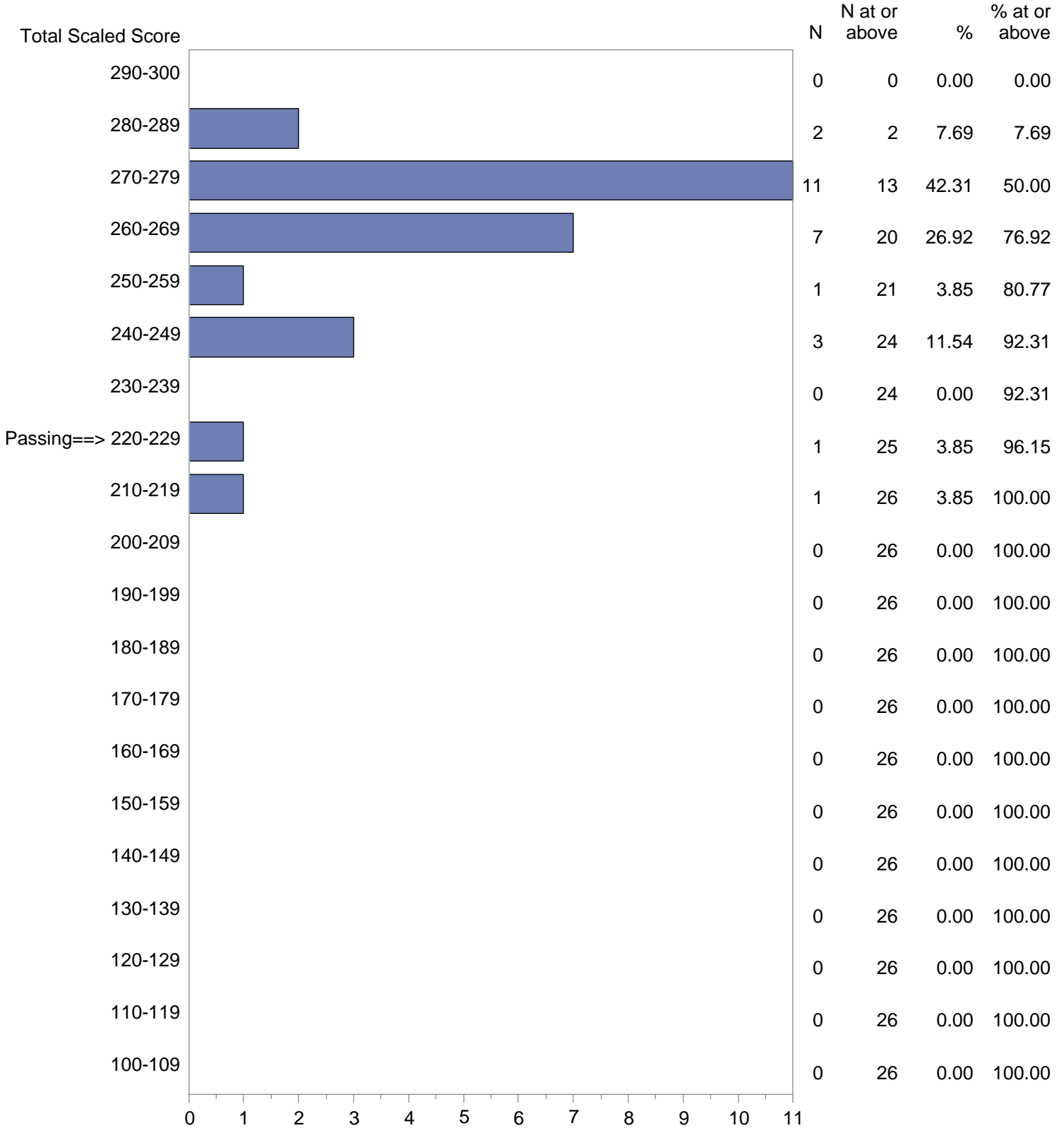
Test Field=Spanish (028)



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 October 1, 2017 - September 30, 2018
 Total Scaled Score Distribution by Test Field (All Forms)

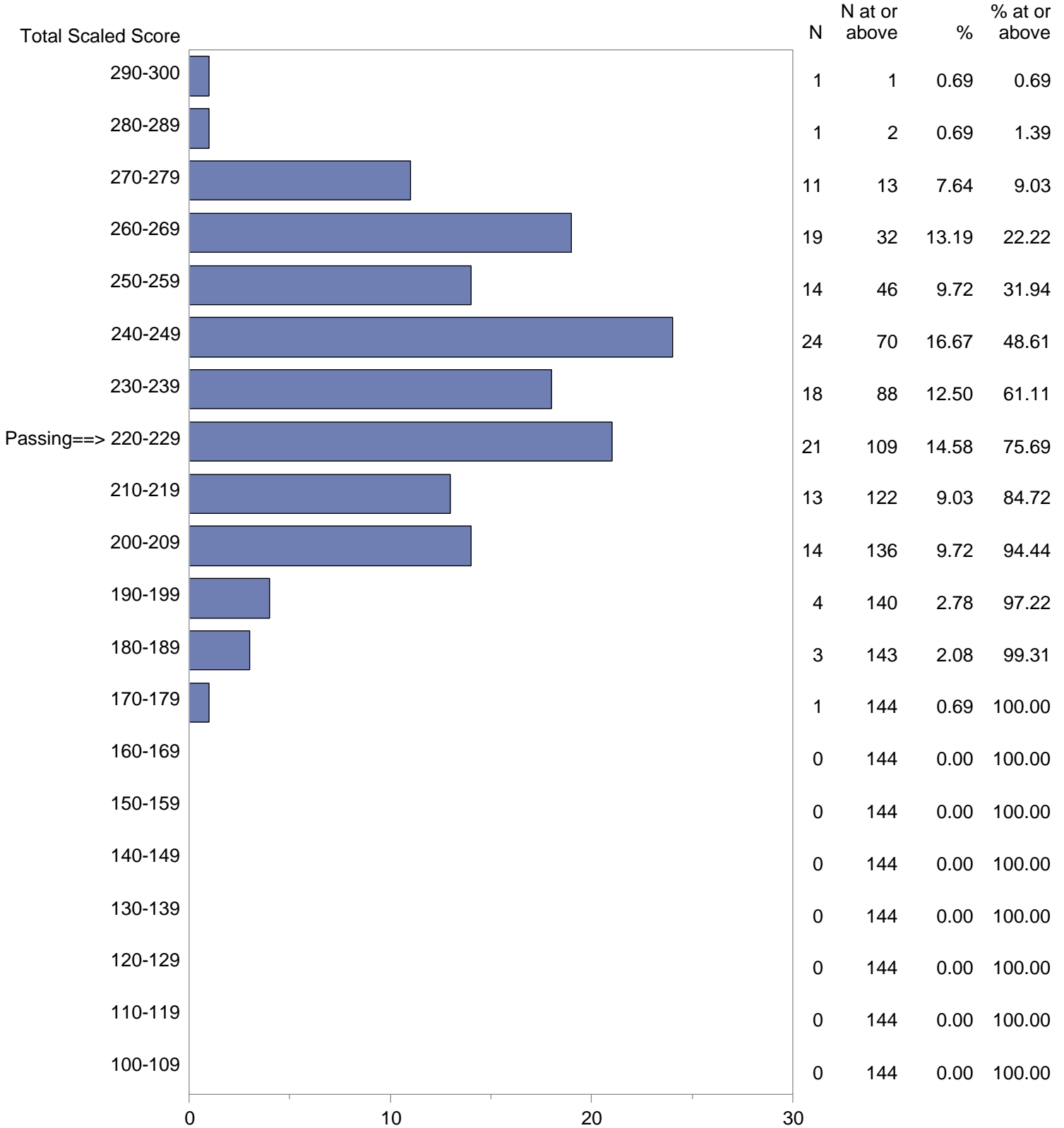
Test Field=Speech (004)



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 October 1, 2017 - September 30, 2018
 Total Scaled Score Distribution by Test Field (All Forms)

Test Field=Visual Arts Education (095)



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Section IV: References

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