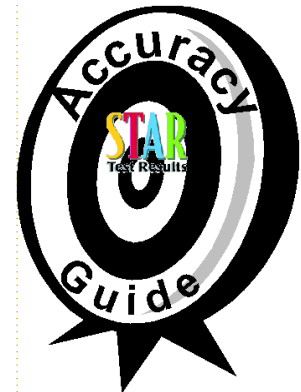


How Accurate Are the STAR National Percentile Rank Scores for Individual Students?—An Interpretive Guide

Version 2.0, CAT/6 Survey

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Summary

The 2003 STAR Program is the first use of the CAT/6 Survey battery. Parents and schools receive National Percentile Rank scores for individual students on the subject tests (Math, Reading, Language) from the CAT/6 Survey tests. How seriously should those individual scores be regarded? Accuracy calculations for the individual scores, repeating those done for the Stanford 9 battery in 1999, can provide some guidance. A quick summary of some results is presented here in the hopes of drawing the reader in for the full presentation. The specific accuracy quantities shown below are computed for an "average" student, a student who under perfect measurement would score at the national 50th percentile:

Hit-rate Accuracy(10) . Probability that the student score is within 10 points of the true value (here, 50th percentile).

Retest Accuracy(20). Probability that two scores (retest, or scores from identical students) are within 20 points of each other.

	Hit-rate Accuracy(10)	Retest Accuracy(20)
Math		
grade 2	.43	.60
grade 4	.57	.74
grade 8	.59	.76
Language		
grade 2	.42	.60
grade 4	.53	.72
grade 8	.60	.77
Reading		
grade 2	.53	.71
grade 4	.61	.79
grade 8	.68	.84

Putting the numbers above in slightly more common language:

- What are the chances that a student who “really belongs” at the 50th percentile in the national norms obtains a score more than 10 percentile points away from the 50th percentile?

For Math grade 2 it's 57%, for Reading grade 2 it's 47%.

- What are the chances that two students with “identical real achievement” (at the 50th percentile in the national norms) obtain scores more than 20 percentile points apart?

For Math grade 2 and Language grade 2 it's 40%, for Reading grade 2 it's 29%.

The tests in the higher grades, which have slightly more items, exhibit somewhat better accuracy. The body of this document (coupled with the 1999 Accuracy Guide for Stanford 9) expands and explains these accuracy results.

Introduction

Background. This report provides an update for the 1999 Accuracy Guide (Rogosa, 1999a, version 1.0), made necessary by the change in STAR 2003 from the Harcourt Stanford 9 standardized tests to the CTB/McGraw-Hill CAT/6 Survey. The purpose here is the same as in the original Accuracy Guide: to apply some common-sense descriptions of accuracy to the National Percentile Rank Scores that are transmitted to parents and schools. The main question to be addressed is, How solid are these numbers? Section 2 of the 1999 Accuracy Guide, *Accuracy in Real-life*, provides explanation of common-sense accuracy in terms of the Pentagon's *circular error probable* for the accuracy of Tomahawk cruise missiles and *Good Housekeeping's* evaluation of Home Body-Fat Testers. Another attempt at explanation (especially in contrast to the psychometric reliability coefficient) is the shoe-shopping example (Rogosa 2002). Press summaries of the prior reports provide even better non-technical explanations: in particular, *New York Times* (September 2000) and *Education Week* (October 1999). Technical academic treatments of these topics are found in Rogosa, (1999b, 1999c). The *References* section provides URL's for all these reports.

Sources. CTB/McGraw-Hill provides superb technical reports for the entire *TerraNova* assessment system. The calculations presented in this report use the information from the CAT/6 *Spring Norms Book* and CAT/6 *Technical Bulletin*. In particular, the Raw Score to Scale Score Tables for Survey Form C and the Scale Score to National Percentile Rank Tables from the *Spring Norms Book* provide the core information.

The main section on Accuracy Results describes the accuracy quantities, provides summary tables (Tables 1-4) , and, following those, presents a set of detailed test-by-test accuracy displays for the Mathematics, Reading, and Language CAT/6 Survey tests in grades 2, 4, 6, 8, 10.

Accuracy Results for CAT/6 Survey

Four kinds of calculations are presented for the accuracy of CAT/6 Survey percentile rank scores: hit-rate, test-retest, comparing two different students, and comparison to a standard (e.g., "proficient" cut-score approximation). First, each of these terms is described, and then the resulting calculations are illustrated with some summary tables in this section. Detailed displays for Mathematics, Reading, and Language CAT/6 Survey tests in grades 2, 4, 6, 8, 10 follow the exposition.

Accuracy Scenarios

hit-rate

Hit-rate is the probability that the discrepancy between the observed-score percentile rank and the percentile the student really belongs at is less than or equal to a specified tolerance. In the language of measurement texts the percentile the student really belongs at is the percentile (obtained from the test's norming distribution) corresponding to the student's true-score. Hit-rate accuracy follows the common-sense interpretation of how close you come to the target; that is, the hit-rate accuracy of the individual percentile rank score is defined in terms of how close the score is to some (idealized) gold-standard measurement. For example, hit-rate with tolerance 5 is the probability that a student who under perfect measurement would score at the 50th percentile obtains a score within 5 points of the 50th percentile (i.e., percentiles between 45 and 55).

test-retest

Following the amateur handyman dictum: "*measure twice, cut once*", one version of retest accuracy is how close together (or far apart) two measurements on the same student would be. If you measured a board twice and the two measurements were not close, you may not be satisfied with the quality of your measurement. The retest probability in the tables gives the probability that the size of the discrepancy between two (hypothetical contemporaneous) scores from a single student is less than or equal to a specified tolerance. Another story for this same calculation is "identical twins separated at test-time". For example, consider two students (e.g., next-door-neighbors) with identical "true" achievement (both really belong at the same percentile). What are the chances of their percentile rank scores being within 10 percentile points of each other?

comparing two different students

An elaboration of the test-retest story is two students with somewhat different true achievement levels. Three examples for student1, student2 pairings of true percentiles are shown in Table 4 and in the individual test displays: (50, 75), (25, 75), (50, 90). The accuracy calculation is the

probability of reversal in the observed percentile rank scores: What's the chance that the (truly) lower achieving student receives the higher score?

comparison to a standard

The fourth accuracy calculation defines, for convenience, a "proficient" level at the national 60th percentile (as many testing programs have found about 40% of students proficient). The accuracy calculation is the probability that a student with a specified true percentile rank would fail to reach the proficient level. For example, what's the probability that a student who under perfect measurement would score at the national 70th percentile obtains a score less than the 60th percentile? Results for this comparison to a standard accuracy calculation are shown in the individual test displays.

Summary Tables

Tables 1-4 provide a view of some of the accuracy calculations across tests. Tables 1-3 show hit-rate and retest values at the tolerance values 5, 10, 15 percentile points for exemplar students who under perfect measurement would score at the 50th (Table 1), 25th (Table 2) and 75th (Table 3) percentiles. To illustrate these entries, focus on the Table 2 setting of a (lower-scoring) student who under perfect measurement would score at the 25th percentile. For the Math grade 8 test, the hit-rate accuracy section indicates that the probability is about two-thirds (i.e., $1 - .34$) that the obtained percentile rank is more than 5 percentile points from the value under perfect measurement. And the probability is about one-sixth (i.e., $1 - .83$) that the obtained percentile rank is more than 15 percentile points from the value under perfect measurement. The retest accuracy section indicates the probability that two students, who under perfect measurement would both score at the 25th percentile, obtain scores more than 10 percentile points apart is a little more than one-half (i.e., $1 - .48$). The probability that these two obtained scores are more than 15 percentile points apart is about one-third (i.e., $1 - .66$).

Obvious features in Tables 1-3 are differences in accuracy over grade levels (in large part due to different number of items) and also some differences between the three subjects. Reading appears to have somewhat higher accuracy values for the exemplar students with true percentile 50 or 25; for the exemplar student who under perfect measurement would score at the 75th percentile, the three tests have rather similar accuracy values. Grade 2 tests, which tend to be the shortest, have the lowest accuracy values shown.

Table 4 shows the probability of reversal for the "compare two students" scenario; therefore, lower values in Table 4 correspond to greater accuracy. The three subjects appear to show similar properties, with grade 2 values again indicating less accuracy.

Table 1.
Hit-rate and Retest Accuracy: 50th Percentile Student

	Hit-rate Accuracy tolerance			Retest Accuracy tolerance		
	5	10	15	5	10	15
Math						
grade 2	0.21	0.43	0.6	0.16	0.32	0.47
grade 4	0.29	0.57	0.76	0.22	0.42	0.6
grade 6	0.29	0.57	0.79	0.23	0.44	0.61
grade 8	0.32	0.59	0.79	0.23	0.44	0.62
grade 10	0.28	0.52	0.71	0.2	0.39	0.56
Language						
grade 2	0.21	0.42	0.6	0.17	0.32	0.47
grade 4	0.29	0.53	0.74	0.21	0.41	0.58
grade 6	0.3	0.59	0.8	0.23	0.44	0.63
grade 8	0.32	0.6	0.79	0.23	0.45	0.63
grade 10	0.31	0.58	0.77	0.23	0.44	0.61
Reading						
grade 2	0.27	0.53	0.74	0.21	0.4	0.57
grade 4	0.32	0.61	0.83	0.24	0.47	0.65
grade 6	0.38	0.68	0.87	0.28	0.52	0.71
grade 8	0.35	0.68	0.87	0.27	0.52	0.71
grade 10	0.38	0.68	0.89	0.28	0.53	0.73

Table 2.
Hit-rate and Retest Accuracy: 25th Percentile Student

	Hit-rate Accuracy tolerance			Retest Accuracy tolerance		
	5	10	15	5	10	15
Math						
grade 2	0.3	0.57	0.77	0.23	0.43	0.6
grade 4	0.43	0.74	0.91	0.32	0.58	0.77
grade 6	0.4	0.71	0.89	0.29	0.54	0.73
grade 8	0.34	0.62	0.83	0.25	0.48	0.66
grade 10	0.25	0.51	0.72	0.2	0.39	0.54
Language						
grade 2	0.31	0.58	0.79	0.23	0.44	0.62
grade 4	0.37	0.69	0.87	0.28	0.52	0.71
grade 6	0.43	0.75	0.91	0.32	0.58	0.77
grade 8	0.38	0.68	0.87	0.28	0.52	0.71
grade 10	0.31	0.58	0.79	0.23	0.44	0.61
Reading						
grade 2	0.41	0.73	0.91	0.31	0.57	0.76
grade 4	0.5	0.83	0.96	0.38	0.67	0.85
grade 6	0.47	0.81	0.95	0.36	0.64	0.83
grade 8	0.49	0.81	0.95	0.36	0.65	0.84
grade 10	0.42	0.74	0.92	0.31	0.58	0.77

Table 3.
Hit-rate and Retest Accuracy: 75th Percentile Student

	Hit-rate Accuracy tolerance			Retest Accuracy tolerance		
	5	10	15	5	10	15
Math						
grade 2	0.25	0.48	0.69	0.19	0.37	0.52
grade 4	0.32	0.62	0.81	0.24	0.46	0.64
grade 6	0.38	0.68	0.88	0.28	0.52	0.71
grade 8	0.36	0.66	0.87	0.27	0.51	0.7
grade 10	0.36	0.66	0.86	0.27	0.51	0.69
Language						
grade 2	0.23	0.46	0.67	0.19	0.35	0.5
grade 4	0.32	0.62	0.83	0.25	0.47	0.65
grade 6	0.37	0.66	0.86	0.27	0.51	0.7
grade 8	0.38	0.69	0.88	0.29	0.53	0.72
grade 10	0.38	0.71	0.89	0.29	0.55	0.74
Reading						
grade 2	0.27	0.52	0.73	0.21	0.4	0.56
grade 4	0.31	0.59	0.8	0.24	0.45	0.63
grade 6	0.36	0.66	0.85	0.27	0.5	0.69
grade 8	0.4	0.7	0.88	0.29	0.54	0.73
grade 10	0.39	0.7	0.89	0.29	0.54	0.74

Table 4. Compare Two Students Accuracy

	Probability of reversal for (student1, student2) true percentiles		
	(50, 75)	(25, 75)	(50, 90)
Math			
grade 2	.165	.023	.046
grade 4	.097	.002	.018
grade 6	.067	.002	.007
grade 8	.071	.003	.005
grade 10	.085	.012	.008
Language			
grade 2	.181	.032	.064
grade 4	.094	.004	.013
grade 6	.070	.001	.010
grade 8	.062	.001	.006
grade 10	.062	.004	.005
Reading			
grade 2	.130	.008	.039
grade 4	.086	.001	.012
grade 6	.055	.001	.013
grade 8	.046	.0003	.005
grade 10	.041	.0006	.003

Individual Test Displays

The individual test displays for the Mathematics, Reading, and Language CAT/6 Survey tests in grades 2, 4, 6, 8, 10 that follow provide more in depth technical examination of the accuracy properties of each test. The set of displays for each test spans two pages. The top of the first page gives basic description of the percentile rank score (PR or p) in relation to the standard error of measurement (s.e.m.) at each level of the scale score. Below that are the hit-rate accuracy results in tabular and graphical form. At the bottom of the first page is the "comparison to a standard" calculation using the 60th percentile as a proxy for "proficient". Probability not proficient is shown for a student with specified percentile under perfect measurement ranging from 30 to 90. For true percentile less than 60, higher accuracy is associated with larger values of this probability and so forth. The second page displays the retest accuracy results in tabular and graphical form. Below that are the "compare two students" results which are also assembled in Table 4.

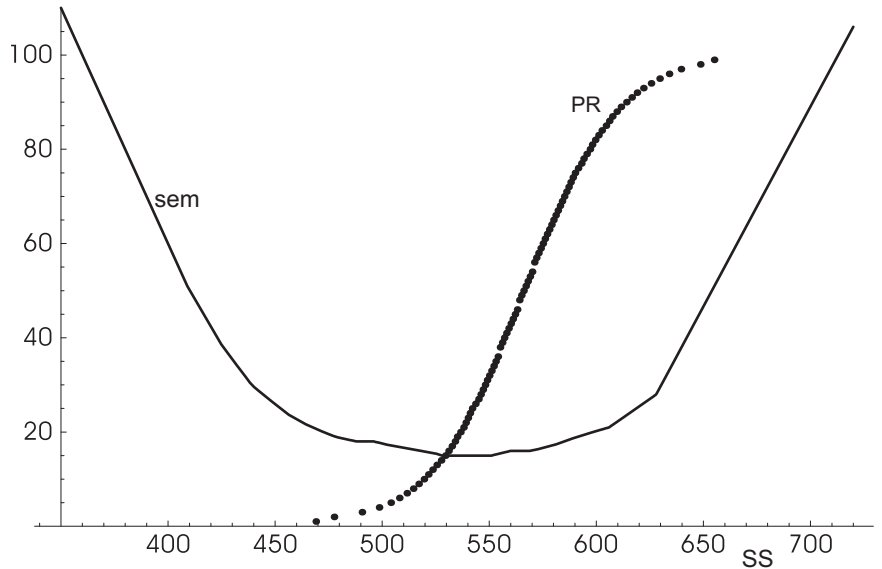
Many detailed features of these displays could be discussed at length. One feature to note is that different tests have their greatest accuracy in different ranges of the achievement distribution. For example, Reading grade 2 is more accurate for lower-performing students than higher performing, whereas Math grade 10 is more accurate at the higher-scoring levels. Another set of interesting comparisons is between the hit-rate and retest accuracy displays here for the CAT/6 survey and similar displays for Math and Reading at each grade level for the Stanford 9 from the 1999 Accuracy Guide. Of course, the accuracy properties of the Stanford 9 are higher because the Stanford 9 is a battery of longer tests. For example, CDE charts indicate that in grade 4 the Stanford 9 battery had testing time 220 minutes, whereas the CAT/6 survey is listed at 165 minutes of testing time.

Technical notes: The discrete aspects of these accuracy calculations are handled in a somewhat careless but reasonable manner. The error distribution at each level of scale score is treated as continuous (Gaussian with variance, square of s.e.m) and the scale score to percentile rank function is also treated as continuous. This marked interpolation and smoothing does not alter the main indications of these accuracy results; a fully discrete calculation just using the PR values obtained by the test would produce similar accuracy indications but with some irregularities for tests with few items and therefore few achievable values. For the reported hit-rate probabilities the mass that lies exactly at the boundary (range $-.5$ to $.5$ reported as the identical integer percentile rank) is split into halves—half to be outside the boundary and half within. Expressed another way, for tolerance set to 5, the reported hit-rate or retest probability can be thought of as the average of that probability using tolerance 4.9 and that same probability using tolerance 5.1. Moreover, in the comparison to a standard with standard set at 60th percentile the calculations properly evaluate the probability strictly below 59.5.

CAT/6 Survey Math Grade 2

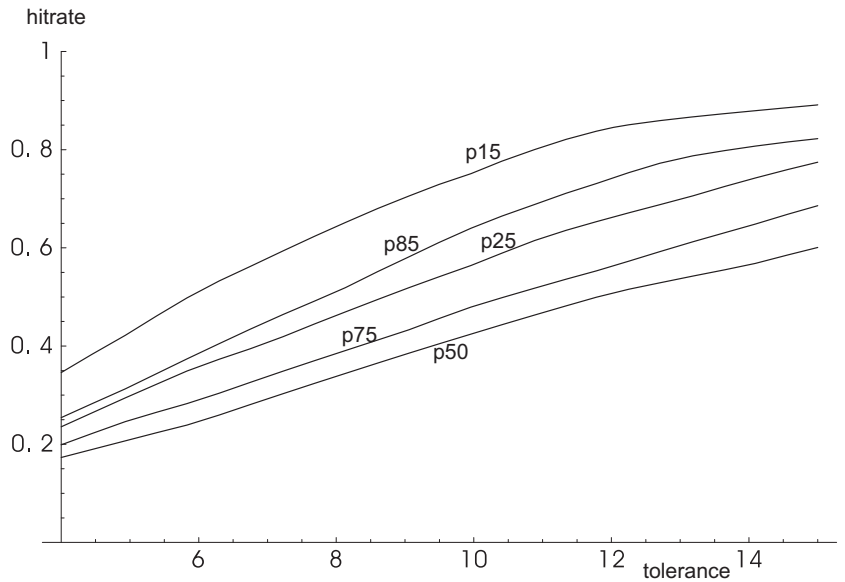
Describing percentile rank (p) and standard error of measurement (sem)
KR20 test reliability .81 for 26 items

p	SS	sem
5	504.	17.11
10	519.5	16.
15	529.5	15.
20	536.5	15.
25	542.	15.
30	548.	15.
35	553.	15.22
40	557.	15.67
45	562.	16.
50	566.	16.
55	570.5	16.15
60	575.	16.6
65	580.	17.17
70	585.	18.
75	590.	18.83
80	597.	19.8
85	604.5	20.8
90	614.	23.55
95	629.5	29.27



HITRATE Accuracy Math Grade 2

p	tolerance			
	5	7.5	10	15
10	0.57	0.79		
15	0.43	0.61		
20	0.32	0.51	0.65	0.85
25	0.3	0.43	0.57	0.77
30	0.29	0.39	0.5	0.72
35	0.23	0.35	0.49	0.66
40	0.23	0.33	0.43	0.64
45	0.22	0.33	0.42	0.6
50	0.21	0.32	0.43	0.6
55	0.22	0.33	0.42	0.61
60	0.23	0.33	0.43	0.6
65	0.23	0.34	0.43	0.63
70	0.22	0.34	0.46	0.65
75	0.25	0.36	0.48	0.69
80	0.29	0.4	0.53	0.75
85	0.32	0.48		
90	0.4	0.62		

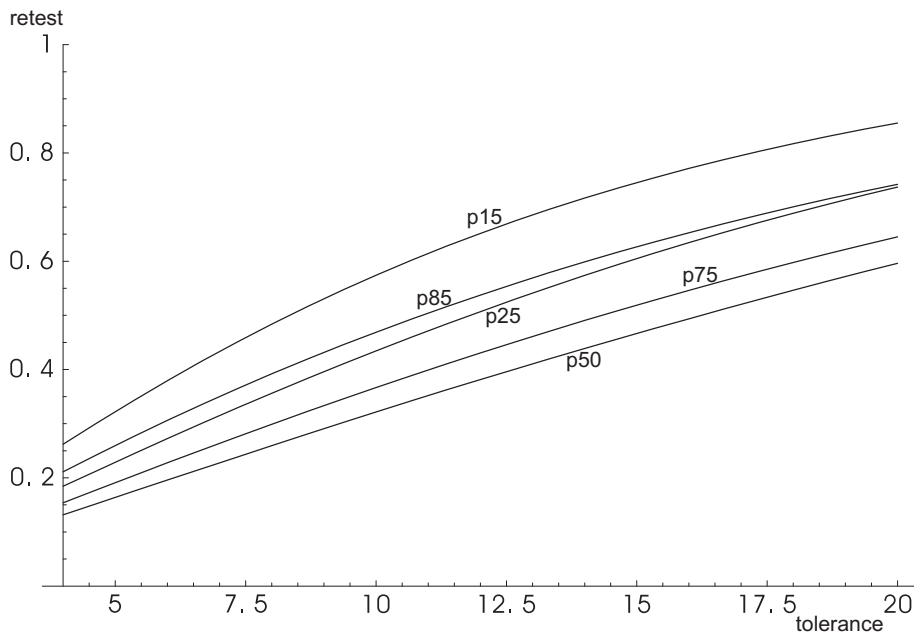


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.961	65	0.374
40	0.868	70	0.28
50	0.702	80	0.128
55	0.598	90	0.047

Test-Retest Accuracy Math Grade 2

p	tolerance			
	5	10	15	20
10	0.42	0.69		
15	0.32	0.57	0.75	
20	0.26	0.49	0.66	
25	0.23	0.43	0.6	0.74
30	0.2	0.39	0.55	0.69
35	0.18	0.36	0.52	0.65
40	0.17	0.34	0.49	0.62
45	0.16	0.32	0.47	0.6
50	0.16	0.32	0.47	0.6
55	0.16	0.32	0.47	0.6
60	0.17	0.33	0.47	0.6
65	0.17	0.34	0.48	0.61
70	0.18	0.35	0.5	0.62
75	0.19	0.37	0.52	0.64
80	0.22	0.41	0.57	
85	0.26	0.47	0.63	
90	0.31	0.53		



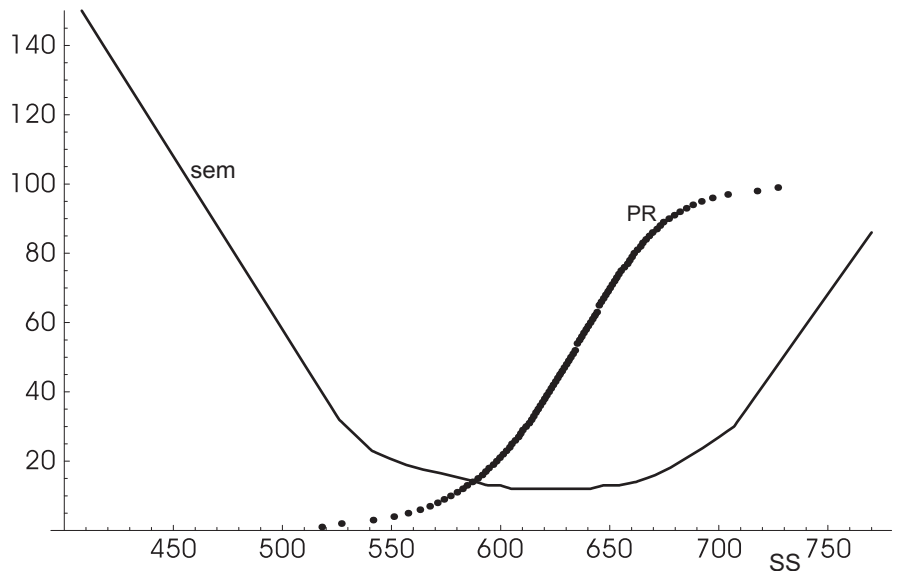
Compare Two Students

Probability of reversal	true percentiles (student1, student2)		
	(50, 75)	(25, 75)	(50, 90)
	.165	.023	.046

CAT/6 Survey Math Grade 4

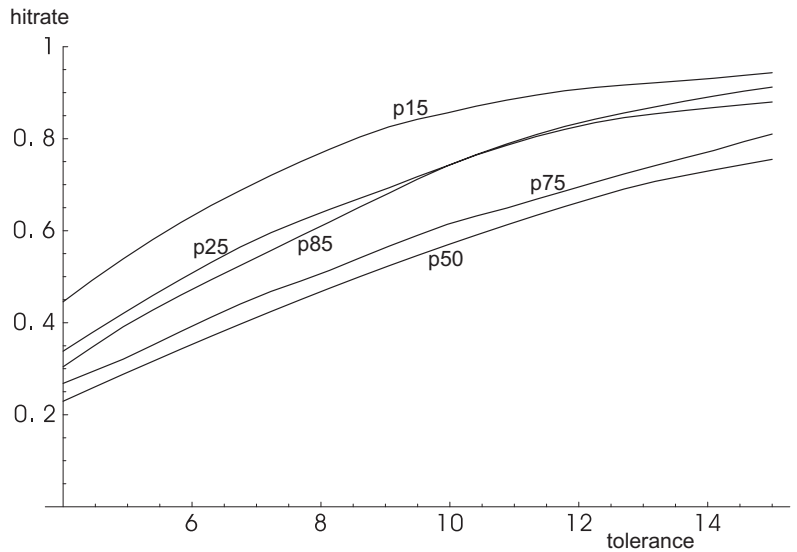
Describing percentile rank (p) and standard error of measurement (sem)
 KR20 test reliability .88 for 32 items

p	SS	sem
5	557.5	18.78
10	577.	15.86
15	589.5	13.9
20	598.	13.
25	605.	12.
30	611.5	12.
35	617.	12.
40	622.	12.
45	627.	12.
50	632.	12.
55	636.	12.
60	641.	12.
65	645.	12.67
70	650.	13.
75	655.	13.12
80	661.	13.88
85	668.	15.33
90	677.	17.85
95	692.	23.48



HITRATE Accuracy Math Grade 4

p	tolerance			
	5	7.5	10	15
10	0.68	0.85		
15	0.55	0.74		
20	0.45	0.66	0.8	0.93
25	0.43	0.61	0.74	0.91
30	0.38	0.54	0.68	0.87
35	0.34	0.49	0.64	0.84
40	0.32	0.47	0.61	0.8
45	0.32	0.46	0.57	0.78
50	0.29	0.44	0.57	0.76
55	0.29	0.44	0.55	0.76
60	0.29	0.42	0.55	0.76
65	0.28	0.42	0.55	0.74
70	0.3	0.43	0.56	0.78
75	0.32	0.48	0.62	0.81
80	0.36	0.52	0.66	0.86
85	0.4	0.58		
90	0.49	0.73		

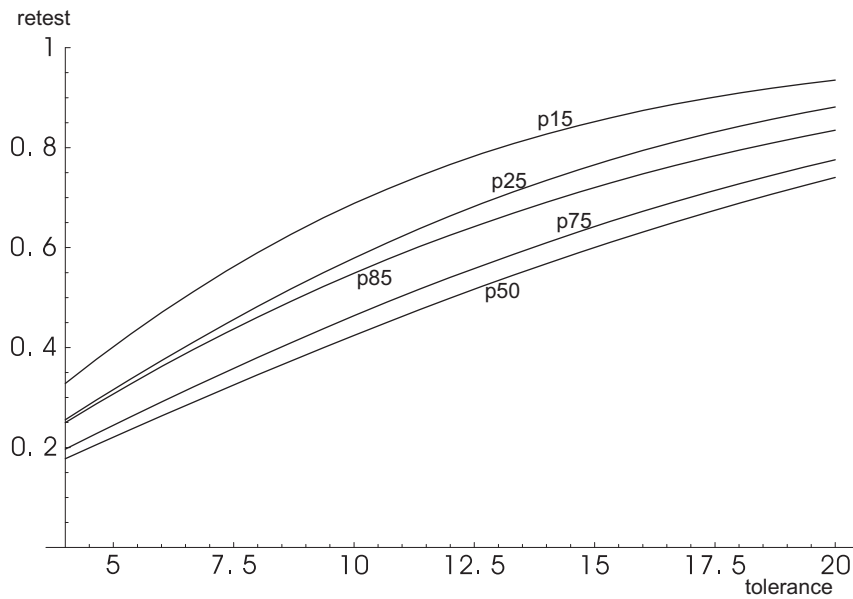


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.992	65	0.361
40	0.938	70	0.232
50	0.761	80	0.07
55	0.646	90	0.02

Test-Retest Accuracy Math Grade 4

p	tolerance			
	5	10	15	20
10	0.5	0.78		
15	0.4	0.69	0.85	
20	0.34	0.62	0.8	
25	0.32	0.58	0.77	0.88
30	0.28	0.52	0.71	0.84
35	0.25	0.48	0.67	0.8
40	0.24	0.46	0.64	0.78
45	0.23	0.44	0.62	0.75
50	0.22	0.42	0.6	0.74
55	0.22	0.42	0.59	0.74
60	0.22	0.42	0.6	0.74
65	0.22	0.41	0.59	0.73
70	0.22	0.43	0.61	0.74
75	0.24	0.46	0.64	0.78
80	0.27	0.5	0.68	
85	0.31	0.55	0.72	
90	0.37	0.62		



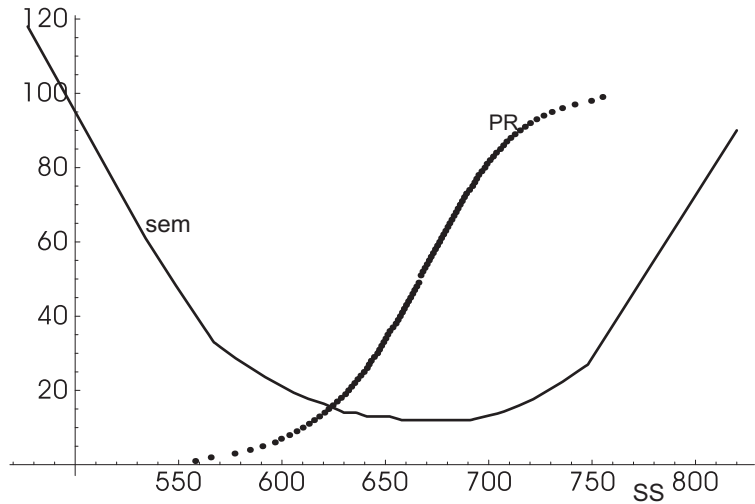
Compare Two Students

Probability of reversal	true percentiles (student1, student2)		
	(50, 75)	(25, 75)	(50, 90)
	.097	.002	.018

CAT/6 Survey Math Grade 6

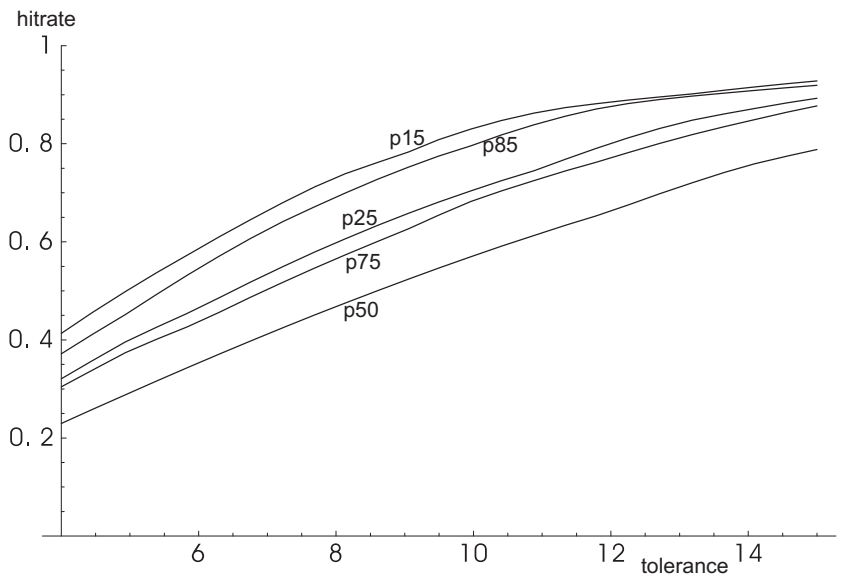
Describing percentile rank (p) and standard error of measurement (sem)
 KR20 test reliability .87 for 31 items

p	SS	sem
5	590.5	24.
10	610.	18.33
15	622.5	16.07
20	632.	14.
25	639.5	13.3
30	646.	13.
35	651.	13.
40	657.	12.17
45	662.	12.
50	666.5	12.
55	671.	12.
60	676.	12.
65	681.	12.
70	686.	12.
75	692.	12.14
80	698.	13.
85	705.5	13.94
90	715.	16.
95	730.5	20.33



HITRATE Accuracy Math Grade 6

p	tolerance			
	5	7.5	10	15
10	0.61	0.81		
15	0.5	0.7		
20	0.46	0.64	0.78	0.91
25	0.4	0.57	0.71	0.89
30	0.34	0.52	0.66	0.86
35	0.33	0.49	0.61	0.81
40	0.35	0.49	0.6	0.8
45	0.31	0.45	0.59	0.79
50	0.29	0.44	0.57	0.79
55	0.31	0.44	0.57	0.77
60	0.32	0.47	0.58	0.79
65	0.32	0.47	0.62	0.81
70	0.35	0.49	0.64	0.84
75	0.38	0.53	0.68	0.88
80	0.4	0.58	0.73	0.9
85	0.46	0.66		
90	0.56	0.78		

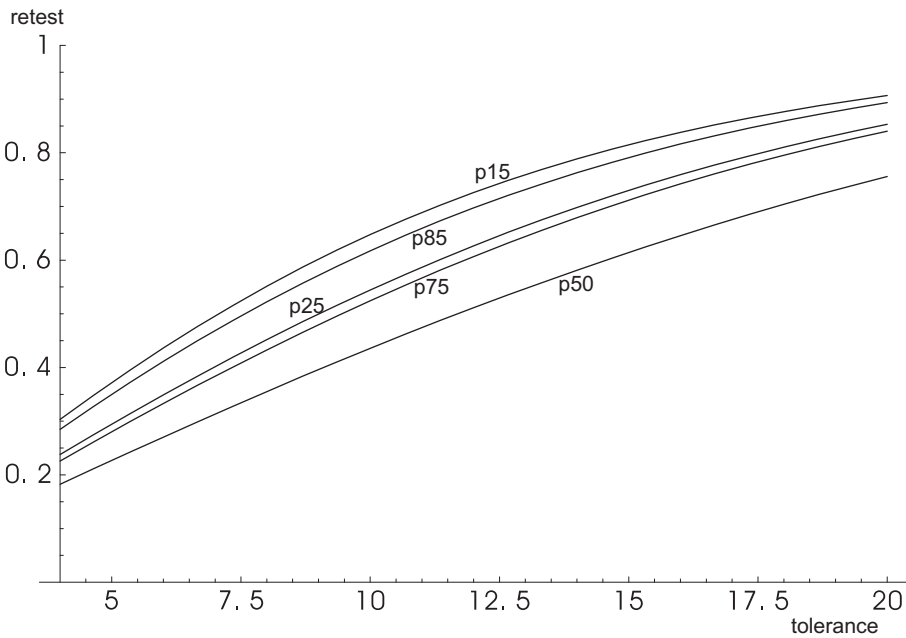


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.988	65	0.323
40	0.936	70	0.191
50	0.773	80	0.042
55	0.646	90	0.007

Test-Retest Accuracy Math Grade 6

p	tolerance			
	5	10	15	20
10	0.45	0.73		
15	0.37	0.65	0.81	
20	0.33	0.6	0.78	
25	0.29	0.54	0.73	0.85
30	0.26	0.5	0.68	0.82
35	0.25	0.47	0.65	0.78
40	0.24	0.46	0.64	0.78
45	0.23	0.45	0.63	0.77
50	0.23	0.44	0.61	0.76
55	0.23	0.43	0.61	0.75
60	0.23	0.44	0.62	0.76
65	0.24	0.46	0.64	0.78
70	0.26	0.49	0.67	0.81
75	0.28	0.52	0.71	0.84
80	0.3	0.56	0.74	
85	0.35	0.62	0.79	
90	0.42	0.69		



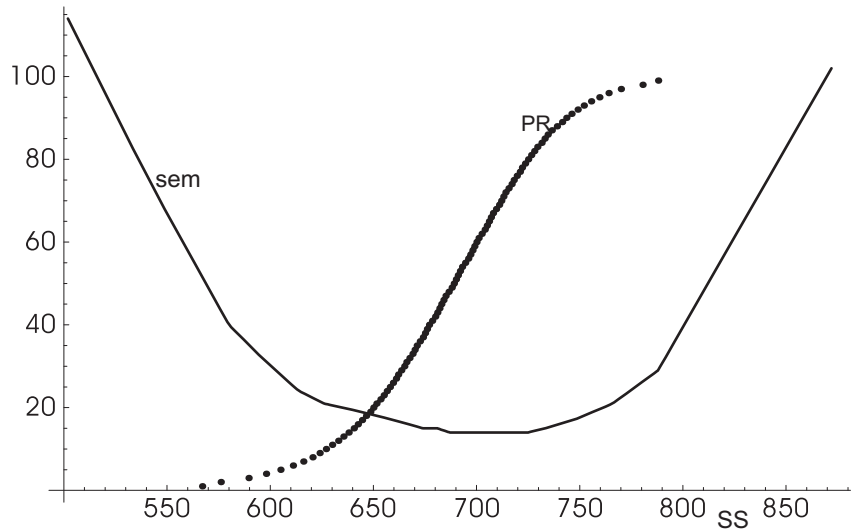
Compare Two Students

Probability of reversal	true percentiles (student1, student2)		
	(50, 75)	(25, 75)	(50, 90)
	.067	.002	.007

CAT/6 Survey Math Grade 8

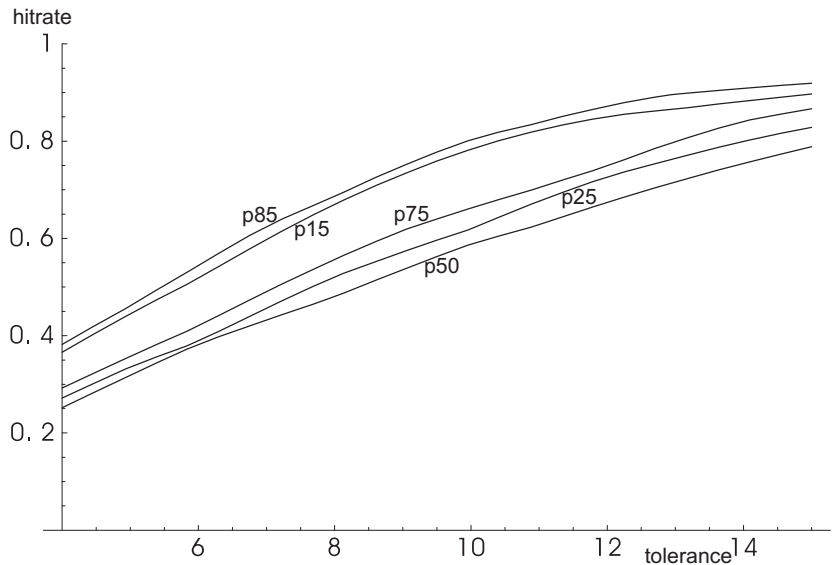
Describing percentile rank (p) and standard error of measurement (sem)
 KR20 test reliability .86 for 31 items

p	SS	sem
5	605.	27.86
10	627.	20.89
15	640.5	19.39
20	650.	18.25
25	658.	17.25
30	665.	16.29
35	671.	15.43
40	677.	15.
45	683.	14.67
50	689.	14.
55	694.5	14.
60	700.	14.
65	706.	14.
70	712.	14.
75	718.	14.
80	725.	14.
85	733.	15.
90	743.5	16.3
95	759.5	19.61



HITRATE Accuracy Math Grade 8

p	tolerance			
	5	7.5	10	15
10	0.59	0.8		
15	0.44	0.64		
20	0.37	0.54	0.69	0.87
25	0.34	0.49	0.62	0.83
30	0.31	0.47	0.59	0.8
35	0.3	0.46	0.58	0.79
40	0.31	0.44	0.58	0.78
45	0.32	0.44	0.58	0.77
50	0.32	0.46	0.59	0.79
55	0.31	0.47	0.59	0.79
60	0.32	0.46	0.59	0.79
65	0.33	0.46	0.6	0.8
70	0.33	0.49	0.63	0.83
75	0.36	0.52	0.66	0.87
80	0.41	0.59	0.73	0.91
85	0.46	0.66		
90	0.58	0.79		

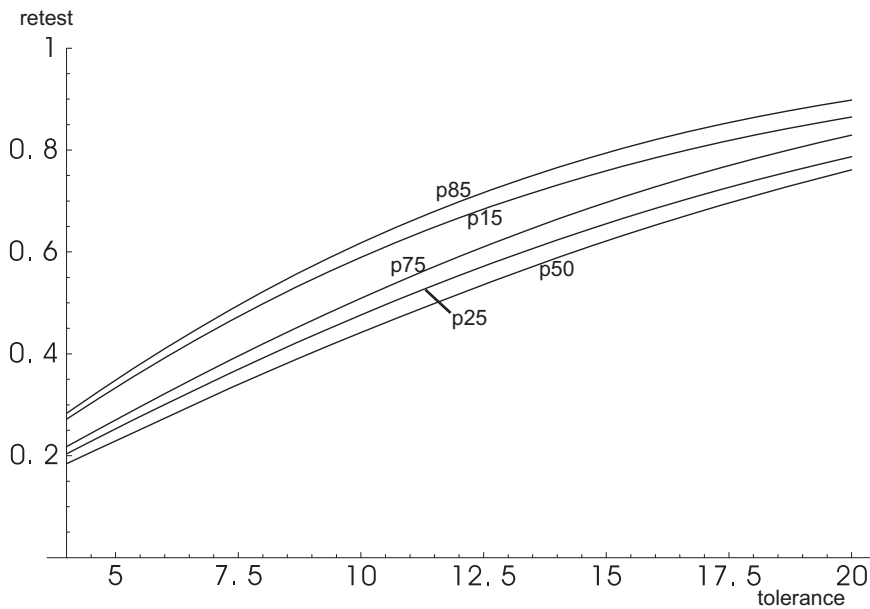


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.983	65	0.321
40	0.933	70	0.186
50	0.773	80	0.034
55	0.64	90	0.003

Test-Retest Accuracy Math Grade 8

p	tolerance			
	5	10	15	20
10	0.43	0.7		
15	0.33	0.59	0.76	
20	0.28	0.52	0.7	
25	0.25	0.48	0.66	0.79
30	0.24	0.45	0.63	0.77
35	0.23	0.44	0.62	0.76
40	0.23	0.43	0.61	0.75
45	0.22	0.43	0.61	0.75
50	0.23	0.44	0.62	0.76
55	0.23	0.44	0.62	0.76
60	0.23	0.45	0.63	0.77
65	0.24	0.46	0.64	0.78
70	0.25	0.48	0.66	0.8
75	0.27	0.51	0.7	0.83
80	0.31	0.56	0.75	
85	0.35	0.62	0.79	
90	0.43	0.71		



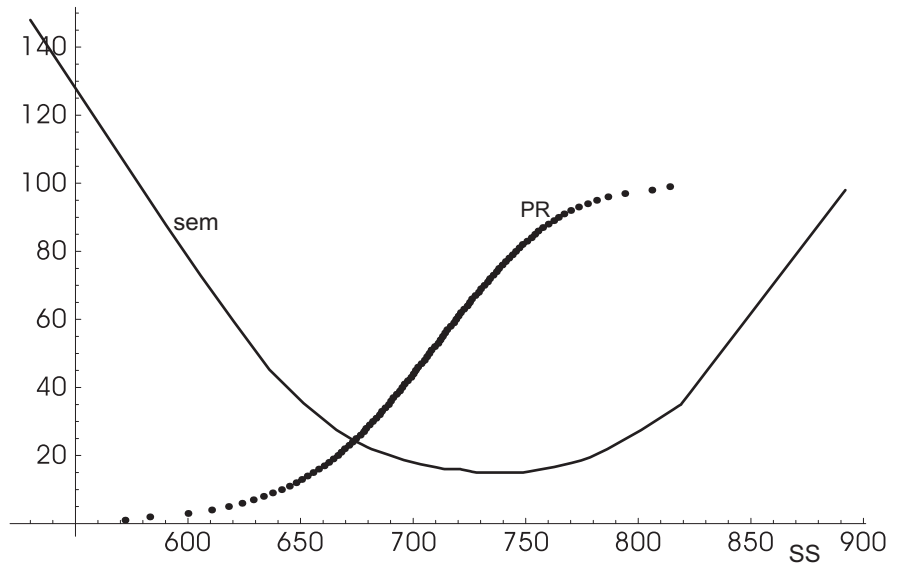
Compare Two Students

	true percentiles (student1, student2)
Probability of reversal	(50, 75) (25, 75) (50, 90)
	.071 .003 .005

CAT/6 Survey Math Grade 10

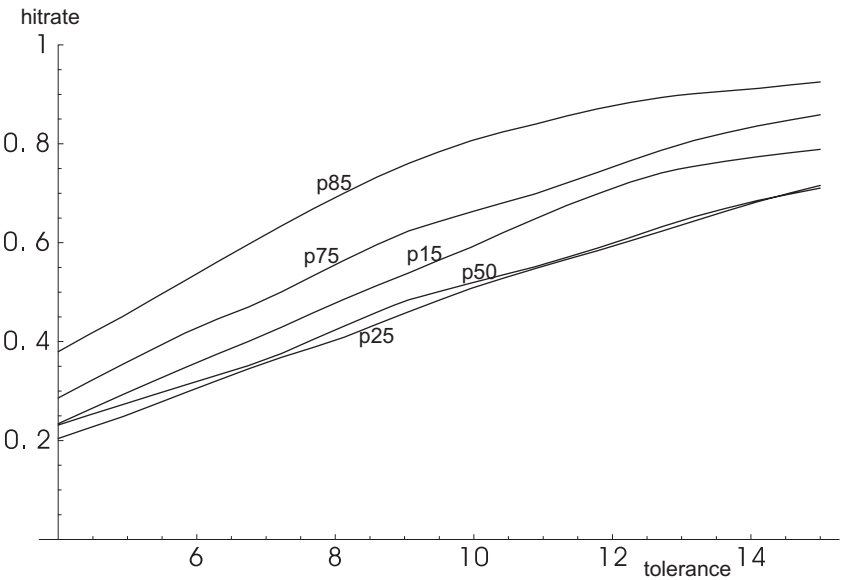
Describing percentile rank (p) and standard error of measurement (sem)
 KR20 test reliability .83 for 25 items

p	SS	sem
5	618.	61.54
10	641.5	41.78
15	655.5	32.75
20	666.5	27.25
25	674.5	24.17
30	682.	21.78
35	689.	20.22
40	695.	18.89
45	701.	17.75
50	707.	17.
55	713.	16.14
60	719.	16.
65	725.	15.43
70	731.5	15.
75	738.	15.
80	745.5	15.
85	754.	15.62
90	764.5	16.83
95	781.5	20.41



HITRATE Accuracy Math Grade 10

p	tolerance			
	5	7.5	10	15
10	0.34	0.57		
15	0.3	0.45		
20	0.27	0.41	0.54	0.76
25	0.25	0.38	0.51	0.72
30	0.26	0.37	0.49	0.7
35	0.25	0.37	0.49	0.68
40	0.25	0.38	0.49	0.69
45	0.26	0.4	0.5	0.7
50	0.28	0.39	0.52	0.71
55	0.29	0.41	0.54	0.74
60	0.29	0.43	0.56	0.75
65	0.31	0.46	0.58	0.79
70	0.34	0.49	0.62	0.82
75	0.36	0.52	0.66	0.86
80	0.41	0.57	0.72	0.91
85	0.46	0.66		
90	0.58	0.8		

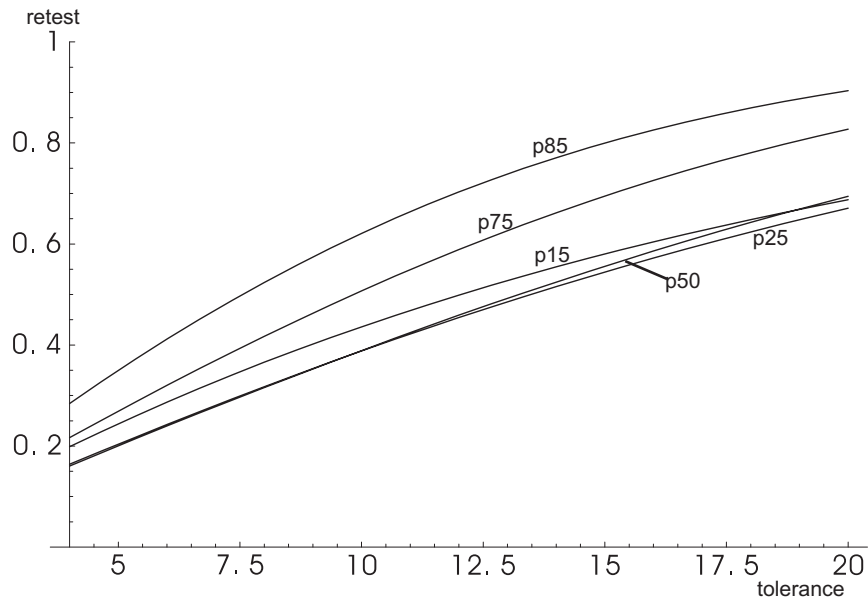


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.953	65	0.337
40	0.893	70	0.193
50	0.751	80	0.036
55	0.633	90	0.003

Test-Retest Accuracy Math Grade 10

p	tolerance			
	5	10	15	20
10	0.28	0.47		
15	0.24	0.44	0.58	
20	0.22	0.41	0.56	
25	0.2	0.39	0.54	0.67
30	0.2	0.38	0.54	0.67
35	0.19	0.37	0.53	0.66
40	0.19	0.37	0.53	0.67
45	0.2	0.38	0.54	0.68
50	0.2	0.39	0.56	0.69
55	0.21	0.41	0.58	0.72
60	0.22	0.42	0.59	0.73
65	0.23	0.44	0.62	0.76
70	0.25	0.48	0.66	0.8
75	0.27	0.51	0.69	0.83
80	0.3	0.56	0.75	
85	0.35	0.62	0.8	
90	0.43	0.71		



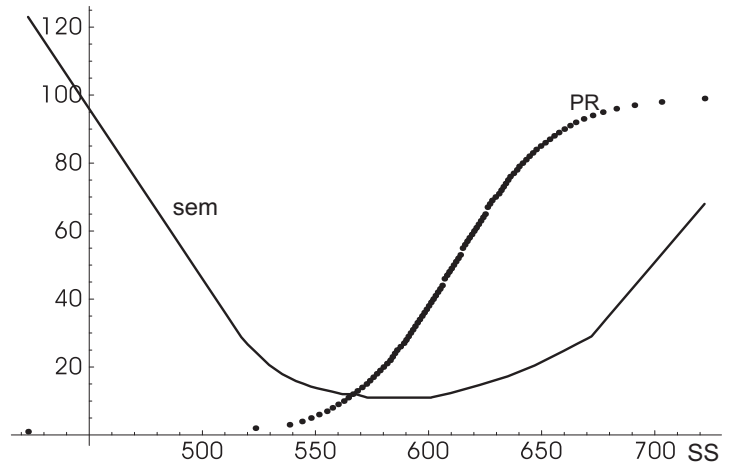
Compare Two Students

	true percentiles (student1, student2)
Probability of reversal	(50, 75) (25, 75) (50, 90)
	.085 .012 .008

CAT/6 Survey Reading Grade 2

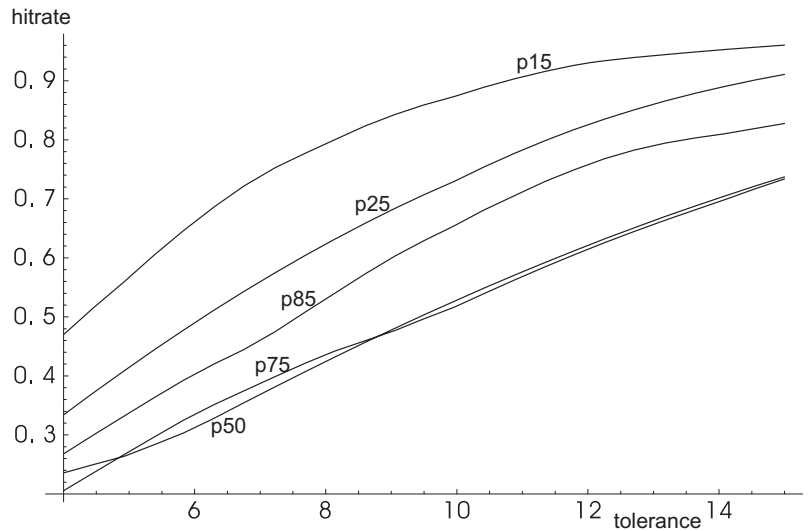
Describing percentile rank (p) and standard error of measurement (sem)
KR20 test reliability .87 for 25 items

p	SS	sem
5	548.	14.25
10	562.5	12.
15	572.5	11.1
20	580.	11.
25	586.	11.
30	592.	11.
35	597.	11.
40	602.	11.17
45	606.5	11.92
50	611.	12.5
55	615.	13.
60	620.	14.11
65	625.	15.2
70	629.5	16.1
75	635.	17.27
80	641.5	19.
85	649.5	21.17
90	660.	24.83
95	677.	32.9



HITRATE Accuracy Reading Grade 2

p	tolerance			
	5	7.5	10	15
10	0.68	0.87		
15	0.57	0.77		
20	0.46	0.68	0.81	0.94
25	0.41	0.59	0.73	0.91
30	0.38	0.53	0.68	0.87
35	0.35	0.5	0.65	0.84
40	0.33	0.47	0.6	0.8
45	0.29	0.44	0.55	0.76
50	0.27	0.4	0.53	0.74
55	0.27	0.41	0.52	0.71
60	0.28	0.35	0.49	0.69
65	0.25	0.38	0.49	0.68
70	0.24	0.37	0.49	0.71
75	0.27	0.41	0.52	0.73
80	0.3	0.44	0.57	0.78
85	0.34	0.49		
90	0.42	0.66		

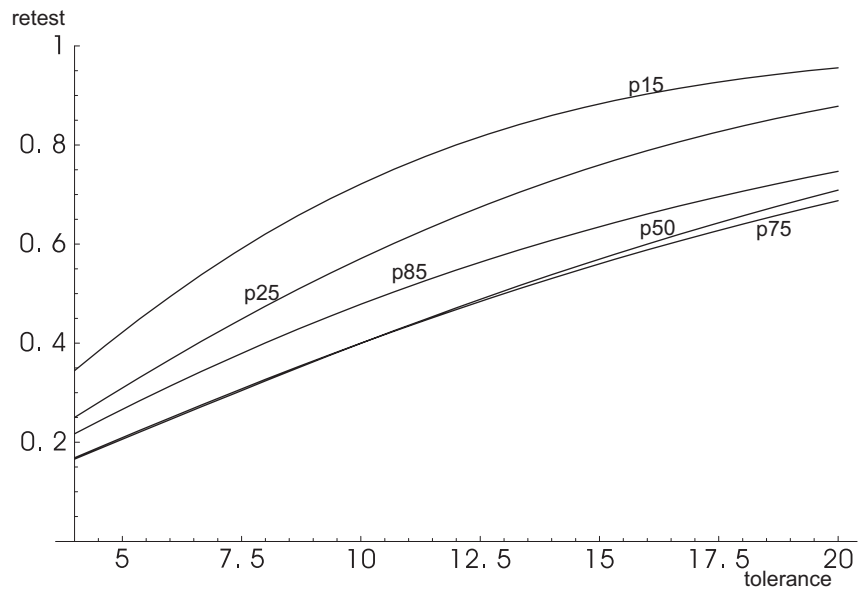


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.994	65	0.359
40	0.941	70	0.267
50	0.752	80	0.123
55	0.635	90	0.051

Test-Retest Accuracy Reading Grade 2

p	tolerance			
	5	10	15	20
10	0.51	0.81		
15	0.42	0.72	0.88	
20	0.35	0.64	0.82	
25	0.31	0.57	0.76	0.88
30	0.28	0.52	0.71	0.84
35	0.26	0.49	0.67	0.81
40	0.24	0.46	0.64	0.78
45	0.22	0.42	0.6	0.74
50	0.21	0.4	0.57	0.71
55	0.2	0.39	0.56	0.69
60	0.19	0.37	0.54	0.67
65	0.19	0.37	0.53	0.66
70	0.2	0.38	0.54	0.67
75	0.21	0.4	0.56	0.69
80	0.23	0.43	0.59	
85	0.27	0.48	0.64	
90	0.33	0.55		



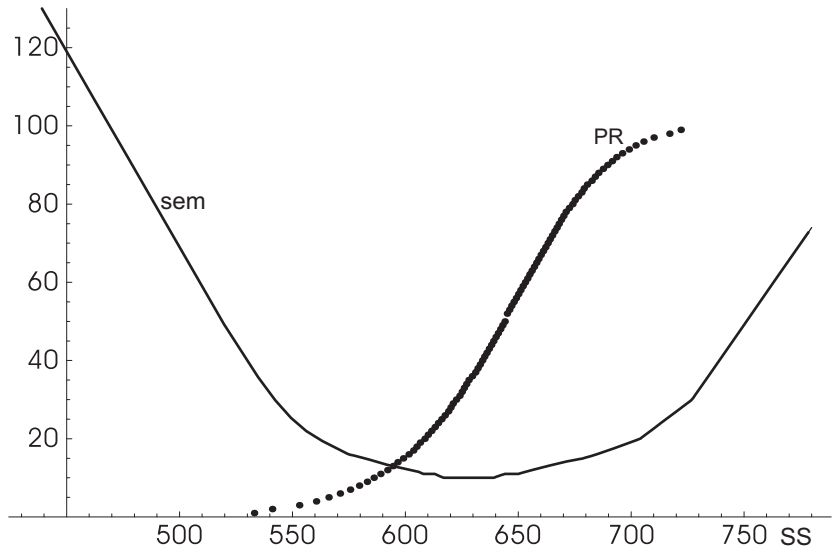
Compare Two Students

Probability of reversal	true percentiles (student1, student2)		
	(50, 75)	(25, 75)	(50, 90)
	.130	.008	.039

CAT/6 Survey Reading Grade 4

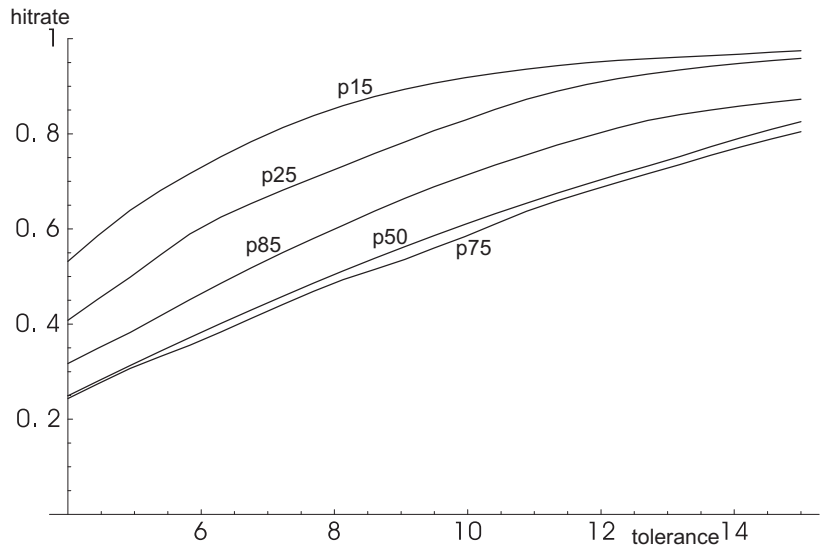
Describing percentile rank (p) and standard error of measurement (sem)
 KR20 test reliability .90 for 35 items

p	SS	sem
5	566.	18.6
10	586.	14.33
15	599.	12.
20	608.5	11.
25	616.	10.25
30	622.5	10.
35	628.	10.
40	634.	10.
45	639.	10.
50	644.	11.
55	648.	11.
60	653.	11.5
65	658.	12.29
70	663.	13.
75	668.	13.71
80	674.	14.44
85	680.5	15.27
90	689.5	16.91
95	702.	19.57



HITRATE Accuracy Reading Grade 4

p	tolerance			
	5	7.5	10	15
10	0.74	0.9		
15	0.65	0.83		
20	0.56	0.76	0.88	0.96
25	0.5	0.7	0.83	0.96
30	0.45	0.66	0.79	0.94
35	0.43	0.6	0.75	0.92
40	0.42	0.58	0.72	0.88
45	0.38	0.52	0.68	0.87
50	0.32	0.48	0.61	0.83
55	0.32	0.48	0.61	0.81
60	0.34	0.49	0.59	0.79
65	0.32	0.46	0.58	0.78
70	0.3	0.44	0.58	0.79
75	0.31	0.46	0.59	0.8
80	0.33	0.49	0.64	0.84
85	0.39	0.57		
90	0.47	0.69		

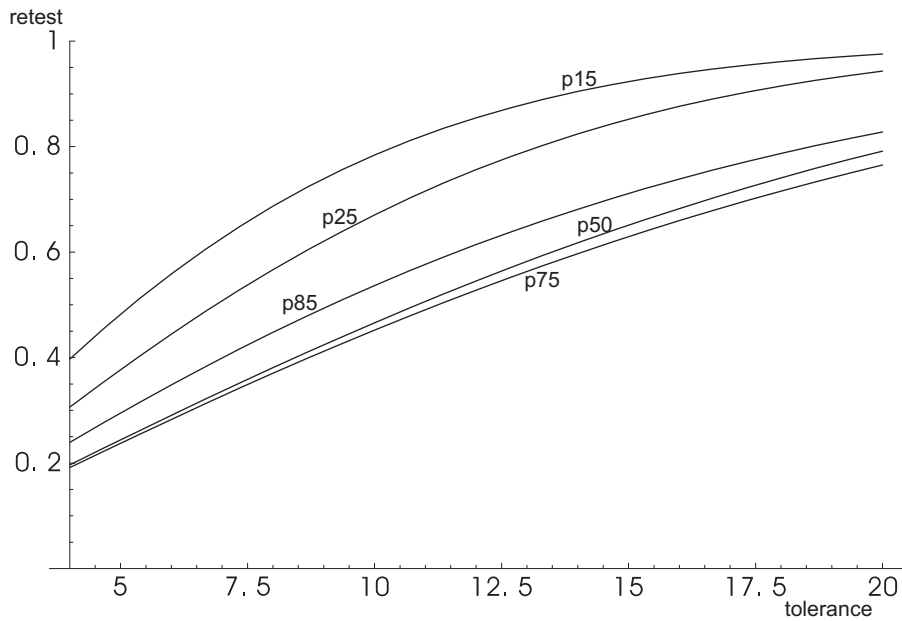


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.999	65	0.327
40	0.968	70	0.21
50	0.78	80	0.068
55	0.659	90	0.014

Test-Retest Accuracy Reading Grade 4

p	tolerance			
	5	10	15	20
10	0.56	0.85		
15	0.48	0.78	0.92	
20	0.41	0.72	0.88	
25	0.38	0.67	0.85	0.94
30	0.34	0.63	0.81	0.92
35	0.32	0.58	0.78	0.89
40	0.29	0.55	0.74	0.86
45	0.27	0.52	0.71	0.84
50	0.24	0.47	0.65	0.79
55	0.24	0.46	0.65	0.79
60	0.24	0.45	0.63	0.77
65	0.23	0.44	0.62	0.76
70	0.23	0.44	0.62	0.76
75	0.24	0.45	0.63	0.76
80	0.26	0.49	0.66	
85	0.29	0.54	0.71	
90	0.36	0.61		



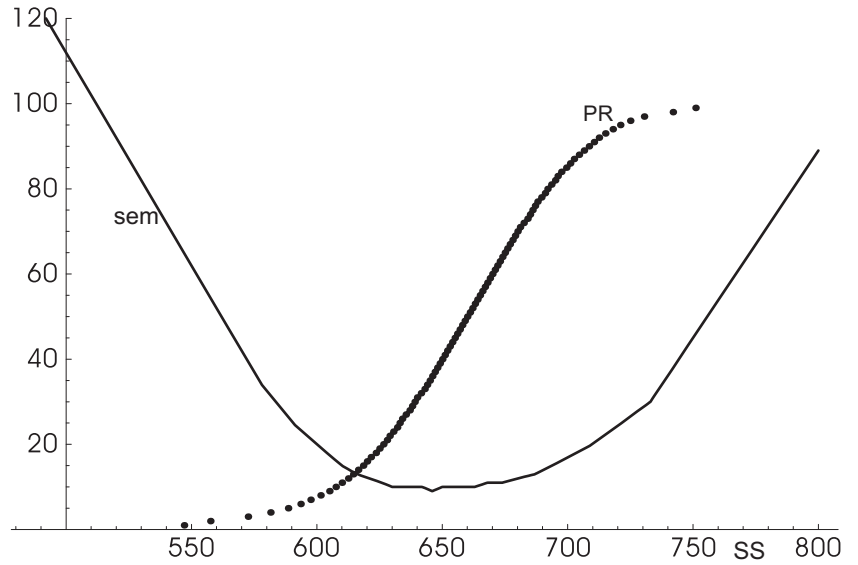
Compare Two Students

Probability of reversal	true percentiles (student1, student2)		
	(50, 75)	(25, 75)	(50, 90)
	.086	.001	.012

CAT/6 Survey Reading Grade 6

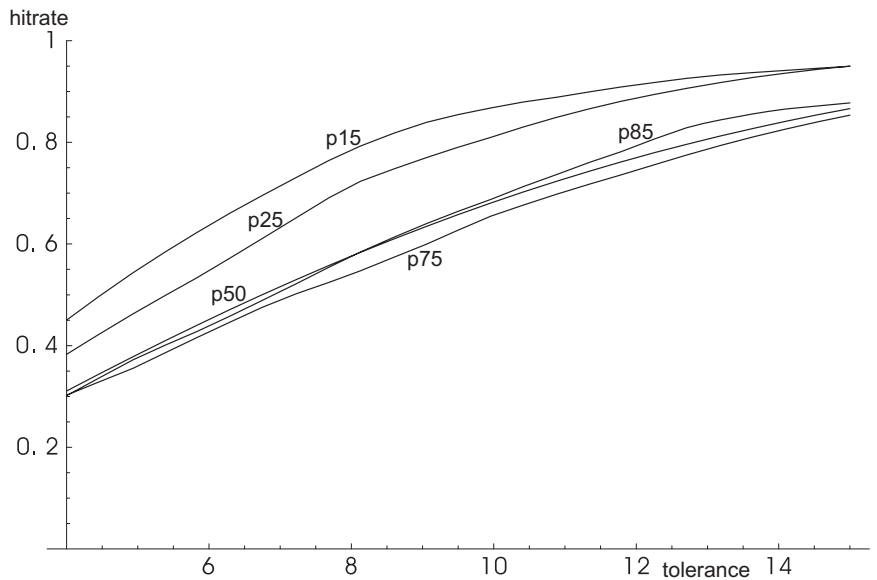
Describing percentile rank (p) and standard error of measurement (sem)
KR20 test reliability .90 for 31 items

p	SS	sem
5	588.5	26.5
10	607.5	16.25
15	618.5	12.5
20	626.5	10.88
25	633.	10.
30	639.	10.
35	645.	9.25
40	650.	10.
45	655.	10.
50	660.	10.
55	665.	10.4
60	670.	11.
65	675.	11.17
70	680.	12.
75	686.	12.86
80	692.	14.5
85	699.5	16.77
90	708.5	19.54
95	721.	24.78



HITRATE Accuracy Reading Grade 6

p	tolerance			
	5	7.5	10	15
10	0.63	0.82		
15	0.55	0.75		
20	0.49	0.7	0.83	0.96
25	0.47	0.68	0.81	0.95
30	0.45	0.62	0.76	0.93
35	0.45	0.62	0.76	0.92
40	0.38	0.55	0.71	0.89
45	0.38	0.55	0.68	0.88
50	0.38	0.55	0.68	0.87
55	0.37	0.53	0.66	0.85
60	0.35	0.5	0.64	0.84
65	0.35	0.52	0.65	0.85
70	0.35	0.5	0.64	0.84
75	0.36	0.52	0.66	0.85
80	0.36	0.51	0.67	0.86
85	0.38	0.54		
90	0.42	0.67		

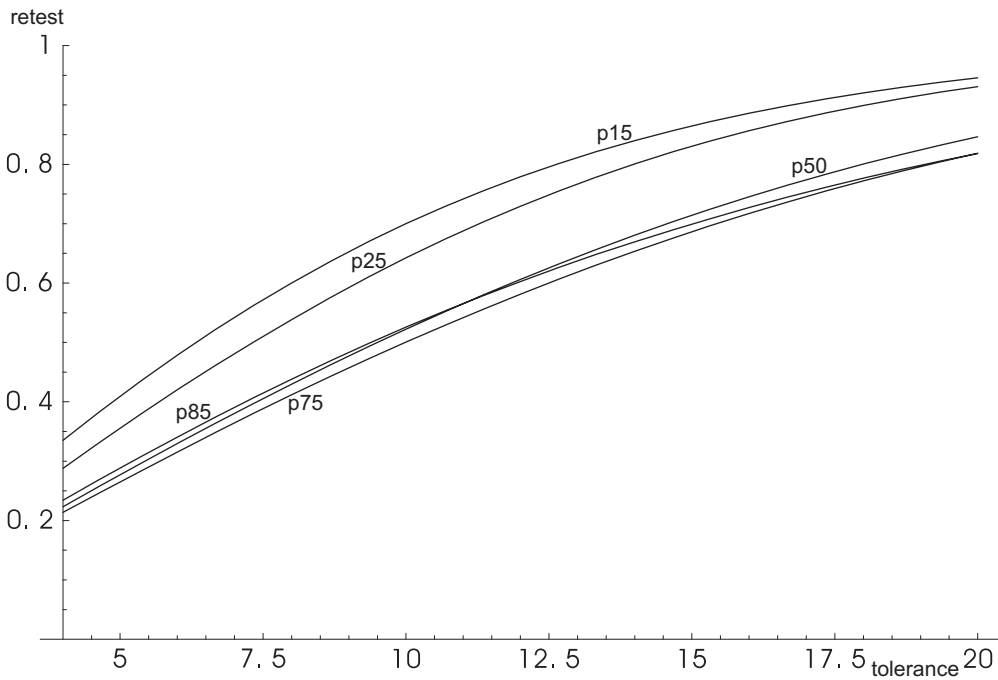


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.999	65	0.311
40	0.974	70	0.191
50	0.829	80	0.06
55	0.667	90	0.023

Test-Retest Accuracy Reading Grade 6

p	tolerance			
	5	10	15	20
10	0.46	0.73		
15	0.41	0.7	0.86	
20	0.38	0.67	0.85	
25	0.36	0.64	0.83	0.93
30	0.33	0.6	0.79	0.9
35	0.32	0.6	0.79	0.91
40	0.29	0.54	0.73	0.86
45	0.28	0.53	0.72	0.85
50	0.28	0.52	0.71	0.85
55	0.27	0.51	0.7	0.83
60	0.26	0.49	0.68	0.81
65	0.26	0.5	0.69	0.82
70	0.26	0.49	0.68	0.81
75	0.27	0.5	0.69	0.82
80	0.27	0.5	0.68	
85	0.29	0.53	0.7	
90	0.34	0.58		



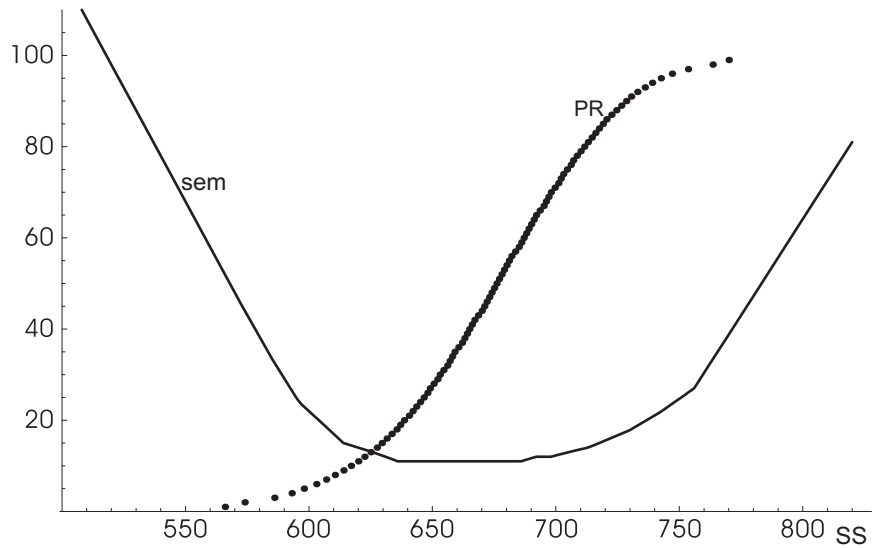
Compare Two Students

Probability of reversal	true percentiles (student1, student2)		
	(50, 75)	(25, 75)	(50, 90)
	.055	.001	.013

CAT/6 Survey Reading Grade 8

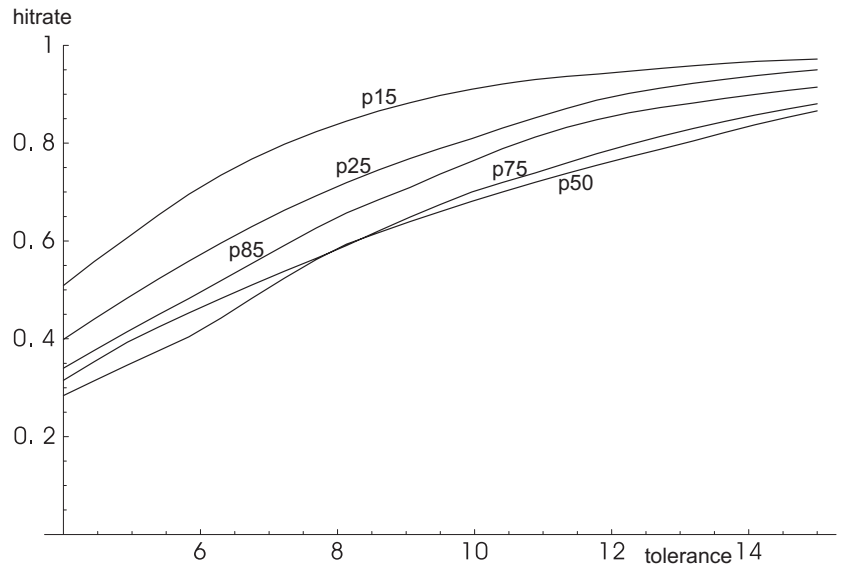
Describing percentile rank (p) and standard error of measurement (sem)
 KR20 test reliability .91 for 34 items

p	SS	sem
5	598.	23.
10	617.	14.5
15	629.5	12.3
20	638.5	11.
25	646.5	11.
30	653.	11.
35	659.	11.
40	665.	11.
45	671.	11.
50	676.	11.
55	681.	11.
60	687.	11.17
65	692.	12.
70	698.	12.
75	704.5	12.93
80	711.5	13.81
85	719.	15.33
90	728.5	17.5
95	742.5	21.86



HITRATE Accuracy Reading Grade 8

p	tolerance			
	5	7.5	10	15
10	0.71	0.88		
15	0.61	0.81		
20	0.56	0.76	0.88	0.97
25	0.49	0.68	0.81	0.95
30	0.43	0.63	0.77	0.93
35	0.41	0.59	0.73	0.91
40	0.41	0.56	0.7	0.88
45	0.38	0.53	0.68	0.88
50	0.35	0.55	0.68	0.87
55	0.38	0.53	0.66	0.87
60	0.38	0.55	0.68	0.87
65	0.35	0.53	0.67	0.86
70	0.4	0.55	0.69	0.88
75	0.4	0.55	0.7	0.88
80	0.4	0.57	0.73	0.91
85	0.42	0.61		
90	0.49	0.73		

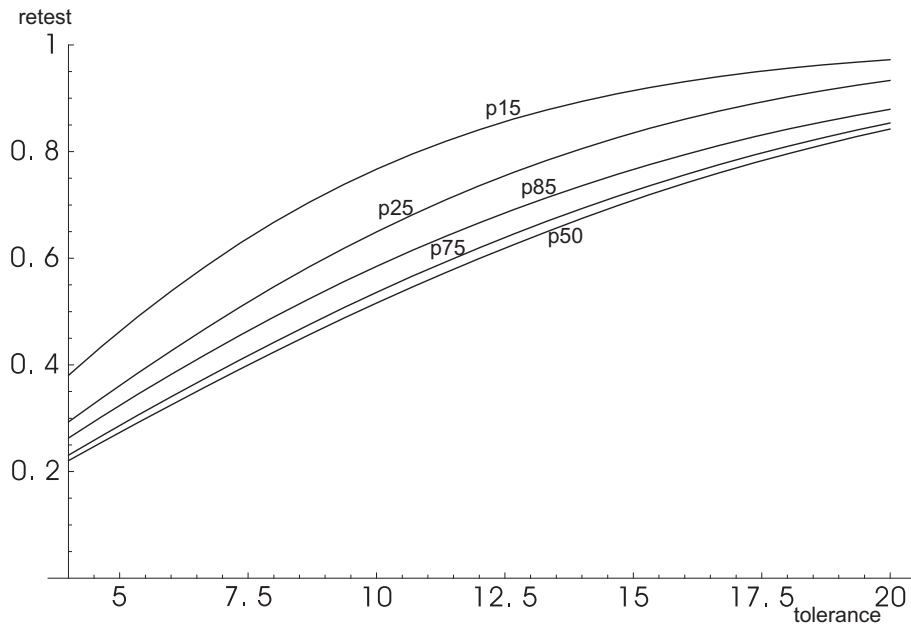


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.999	65	0.323
40	0.975	70	0.169
50	0.83	80	0.035
55	0.691	90	0.008

Test-Retest Accuracy Reading Grade 8

p	tolerance			
	5	10	15	20
10	0.54	0.83		
15	0.46	0.77	0.91	
20	0.42	0.72	0.89	
25	0.36	0.65	0.84	0.93
30	0.33	0.6	0.79	0.91
35	0.3	0.57	0.76	0.88
40	0.29	0.54	0.73	0.86
45	0.28	0.52	0.72	0.85
50	0.27	0.52	0.71	0.84
55	0.27	0.52	0.71	0.84
60	0.28	0.52	0.71	0.85
65	0.27	0.51	0.7	0.83
70	0.28	0.53	0.72	0.85
75	0.29	0.54	0.73	0.85
80	0.3	0.56	0.75	
85	0.32	0.58	0.77	
90	0.38	0.64		



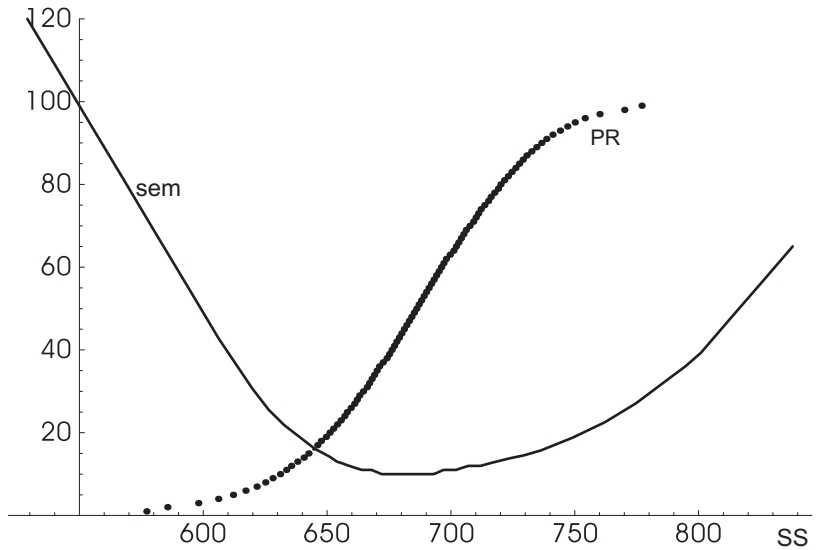
Compare Two Students

Probability of reversal	true percentiles (student1, student2)		
	(50, 75)	(25, 75)	(50, 90)
	.046	.0003	.005

CAT/6 Survey Reading Grade 10

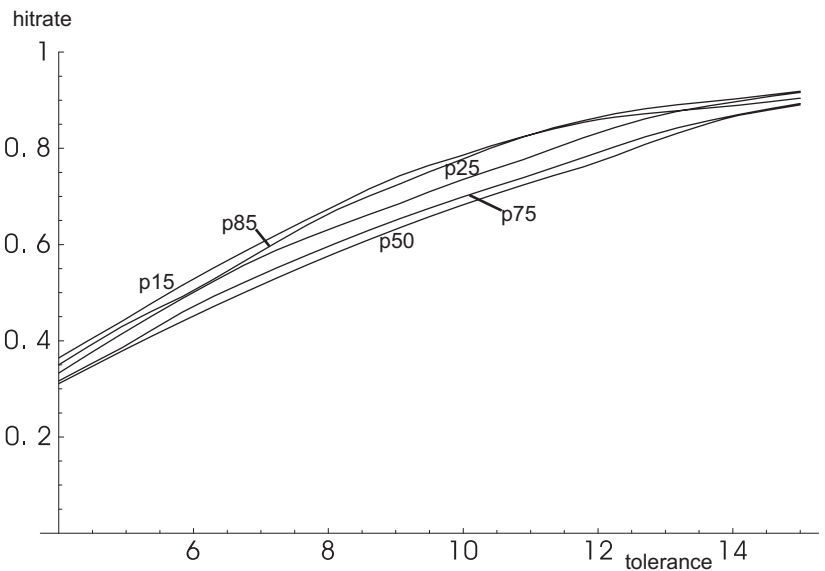
Describing percentile rank (p) and standard error of measurement (sem)
 KR20 test reliability .89 for 34 items

p	SS	sem
5	612.	37.4
10	631.	22.8
15	642.5	16.86
20	651.	14.2
25	658.	12.2
30	664.5	11.
35	670.	10.5
40	676.	10.
45	681.	10.
50	686.	10.
55	691.	10.
60	696.	10.75
65	702.	11.
70	707.5	12.
75	713.5	12.25
80	720.	13.29
85	727.5	14.31
90	736.5	15.78
95	750.	19.



HITRATE Accuracy Reading Grade 10

p	tolerance			
	5	7.5	10	15
10	0.49	0.71		
15	0.45	0.64		
20	0.41	0.61	0.75	0.91
25	0.42	0.6	0.74	0.92
30	0.41	0.6	0.74	0.91
35	0.42	0.58	0.73	0.9
40	0.42	0.58	0.72	0.9
45	0.38	0.55	0.71	0.88
50	0.38	0.55	0.68	0.89
55	0.38	0.55	0.71	0.88
60	0.39	0.54	0.68	0.87
65	0.4	0.56	0.69	0.88
70	0.37	0.55	0.68	0.87
75	0.39	0.57	0.7	0.89
80	0.4	0.57	0.72	0.9
85	0.44	0.63		
90	0.52	0.76		

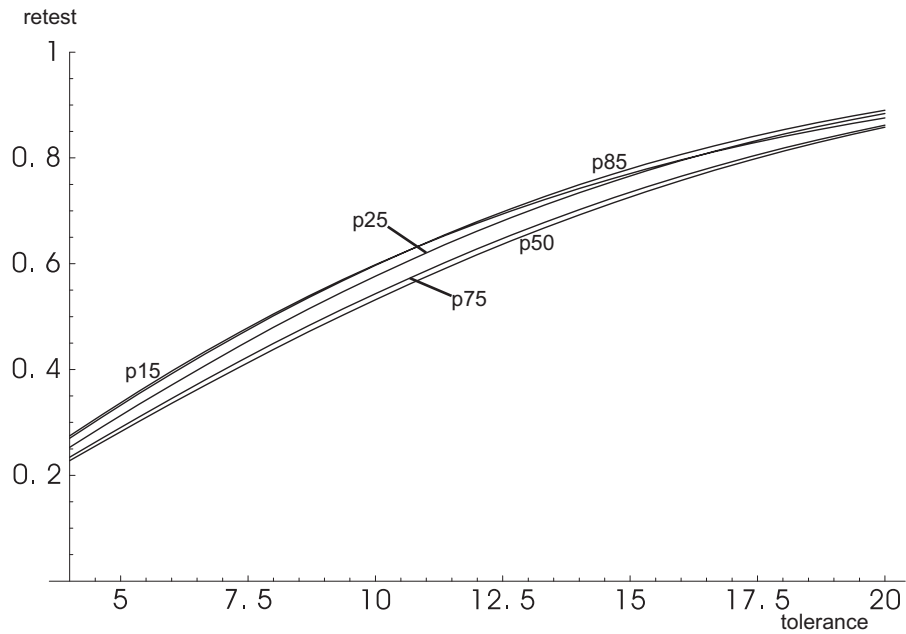


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.998	65	0.277
40	0.974	70	0.159
50	0.829	80	0.033
55	0.674	90	0.005

Test-Retest Accuracy Reading Grade 10

p	tolerance			
	5	10	15	20
10	0.37	0.61		
15	0.34	0.6	0.77	
20	0.32	0.58	0.76	
25	0.31	0.58	0.77	0.88
30	0.31	0.57	0.77	0.89
35	0.3	0.56	0.75	0.88
40	0.3	0.55	0.75	0.87
45	0.29	0.54	0.73	0.86
50	0.28	0.53	0.73	0.86
55	0.29	0.54	0.73	0.86
60	0.28	0.52	0.71	0.84
65	0.28	0.53	0.73	0.85
70	0.28	0.52	0.71	0.84
75	0.29	0.54	0.74	0.86
80	0.3	0.56	0.75	
85	0.33	0.6	0.78	
90	0.40	0.67		



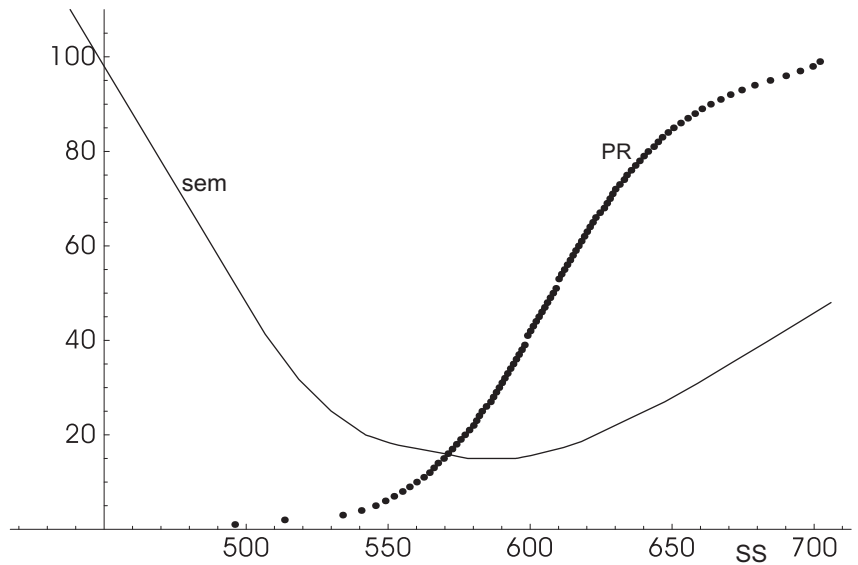
Compare Two Students

	true percentiles (student1, student2)
Probability of reversal	(50, 75) (25, 75) (50, 90)
	.041 .0006 .003

CAT/6 Survey Language Grade 2

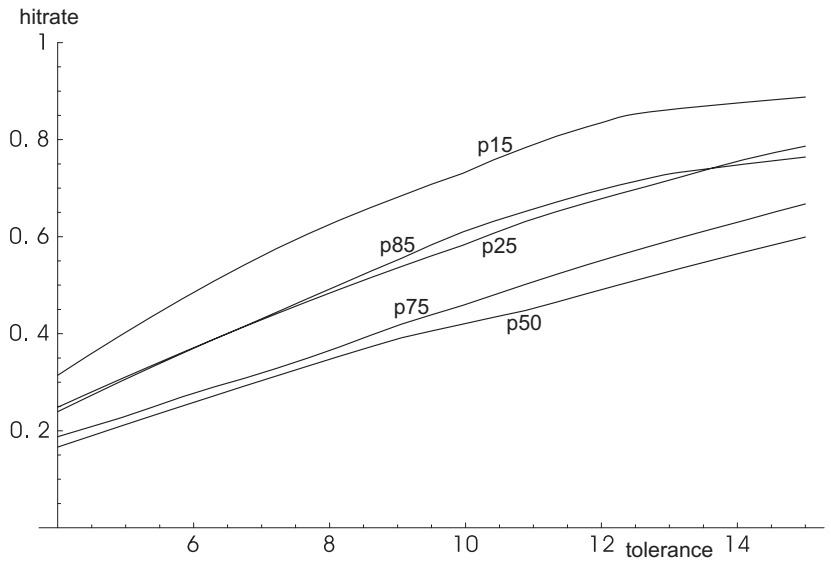
Describing percentile rank (p) and standard error of measurement (sem)
KR20 test reliability .79 for 20 items

p	SS	sem
5	545.5	19.3
10	560.	17.11
15	569.5	16.06
20	577.	15.12
25	583.	15.
30	589.	15.
35	594.	15.
40	598.5	15.39
45	603.	15.89
50	608.	16.67
55	612.	17.33
60	617.	18.29
65	622.	19.71
70	628.	21.43
75	634.	23.14
80	641.5	25.29
85	650.5	27.86
90	663.5	32.51
95	684.5	40.1



HITRATE Accuracy Language Grade 2

p	tolerance			
	5	7.5	10	15
10	0.51	0.76		
15	0.4	0.59		
20	0.34	0.52	0.66	0.85
25	0.31	0.46	0.58	0.79
30	0.29	0.41	0.52	0.73
35	0.25	0.36	0.49	0.7
40	0.23	0.35	0.46	0.65
45	0.23	0.32	0.43	0.62
50	0.21	0.33	0.42	0.6
55	0.2	0.31	0.42	0.6
60	0.22	0.33	0.41	0.6
65	0.22	0.32	0.42	0.6
70	0.22	0.33	0.43	0.63
75	0.23	0.34	0.46	0.67
80	0.26	0.39	0.51	0.74
85	0.31	0.46		
90	0.4	0.56		

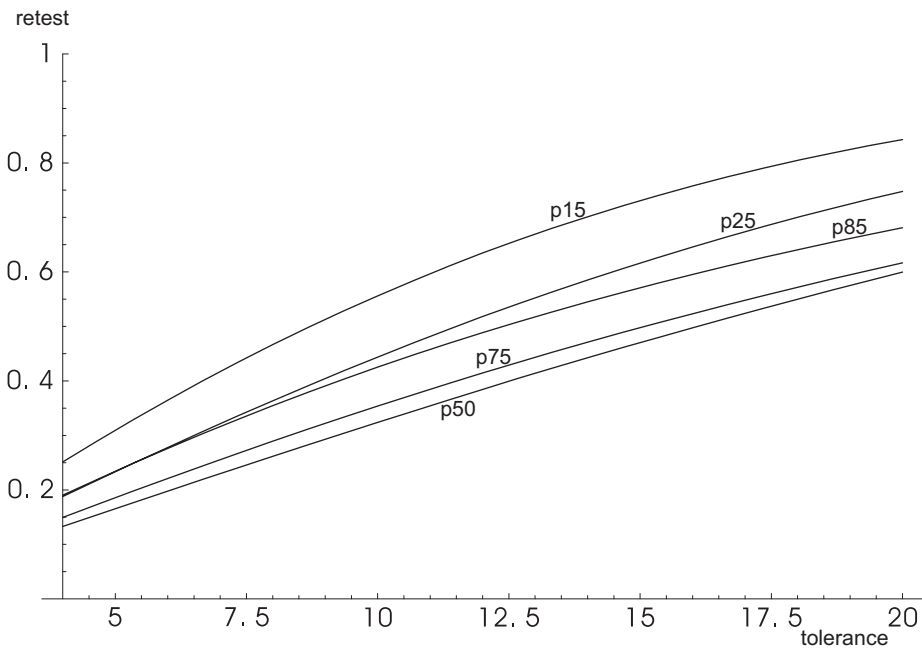


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.967	65	0.39
40	0.879	70	0.296
50	0.695	80	0.161
55	0.602	90	0.074

Test-Retest Accuracy Language Grade 2

p	tolerance			
	5	10	15	20
10	0.4	0.65		
15	0.31	0.56	0.73	
20	0.27	0.5	0.67	
25	0.23	0.44	0.62	0.75
30	0.21	0.4	0.57	0.7
35	0.19	0.37	0.53	0.67
40	0.18	0.35	0.51	0.64
45	0.17	0.34	0.49	0.62
50	0.17	0.32	0.47	0.6
55	0.16	0.32	0.47	0.59
60	0.16	0.32	0.47	0.59
65	0.17	0.32	0.47	0.59
70	0.17	0.33	0.48	0.6
75	0.19	0.35	0.5	0.62
80	0.21	0.39	0.53	
85	0.23	0.43	0.57	
90	0.25	0.45		



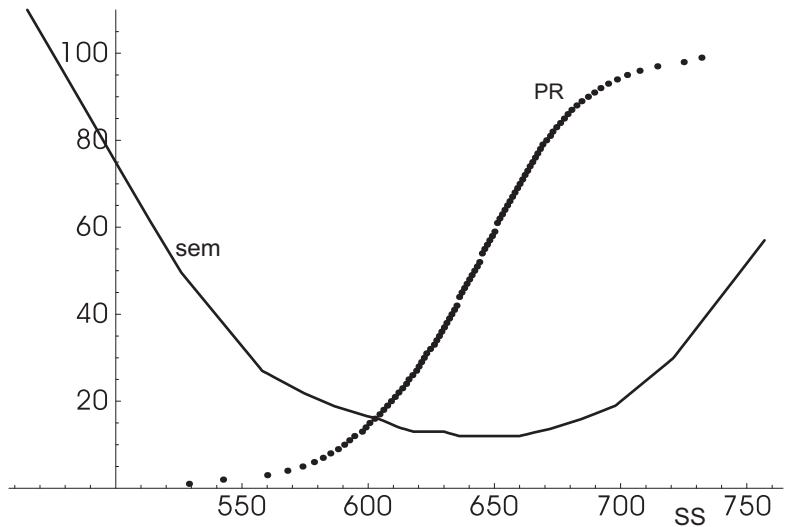
Compare Two Students

Probability of reversal	true percentiles (student1, student2)		
	(50, 75)	(25, 75)	(50, 90)
	.181	.032	.064

CAT/6 Survey Language Grade 4

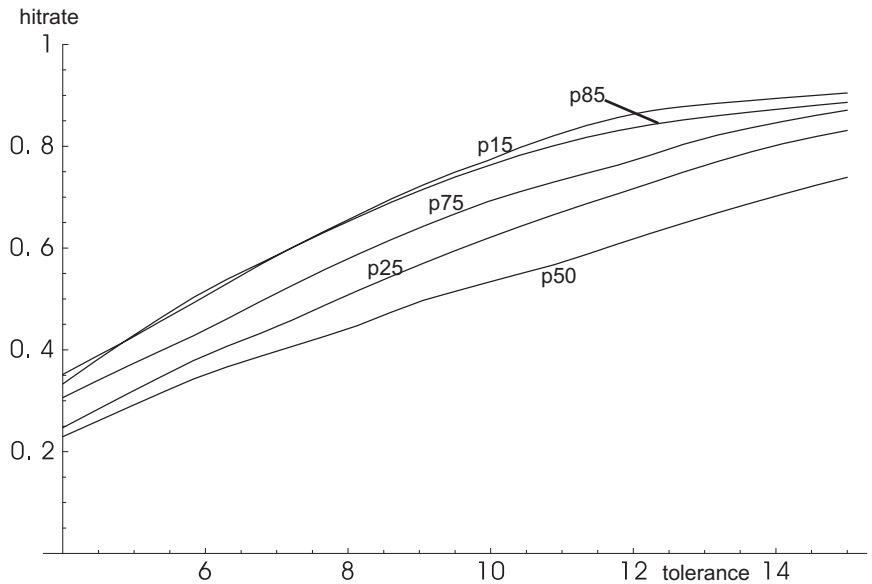
Describing percentile rank (p) and standard error of measurement (sem)
 KR20 test reliability .85 for 25 items

p	SS	sem
5	574.	22.
10	590.5	18.1
15	600.5	16.44
20	609.	14.75
25	616.	13.33
30	622.	13.
35	628.	13.
40	633.	12.5
45	637.	12.
50	642.	12.
55	646.	12.
60	650.5	12.
65	655.	12.
70	660.	12.
75	665.	12.71
80	670.5	13.44
85	677.5	14.5
90	687.	16.46
95	702.5	21.15



HITRATE Accuracy Language Grade 4

p	tolerance			
	5	7.5	10	15
10	0.53	0.78		
15	0.43	0.62		
20	0.4	0.57	0.71	0.89
25	0.37	0.55	0.69	0.87
30	0.36	0.51	0.64	0.83
35	0.33	0.45	0.58	0.79
40	0.28	0.43	0.57	0.76
45	0.29	0.43	0.55	0.76
50	0.29	0.42	0.53	0.74
55	0.28	0.41	0.55	0.74
60	0.29	0.42	0.55	0.76
65	0.31	0.44	0.57	0.76
70	0.32	0.47	0.59	0.81
75	0.32	0.48	0.62	0.83
80	0.36	0.52	0.67	0.87
85	0.43	0.62		
90	0.54	0.77		

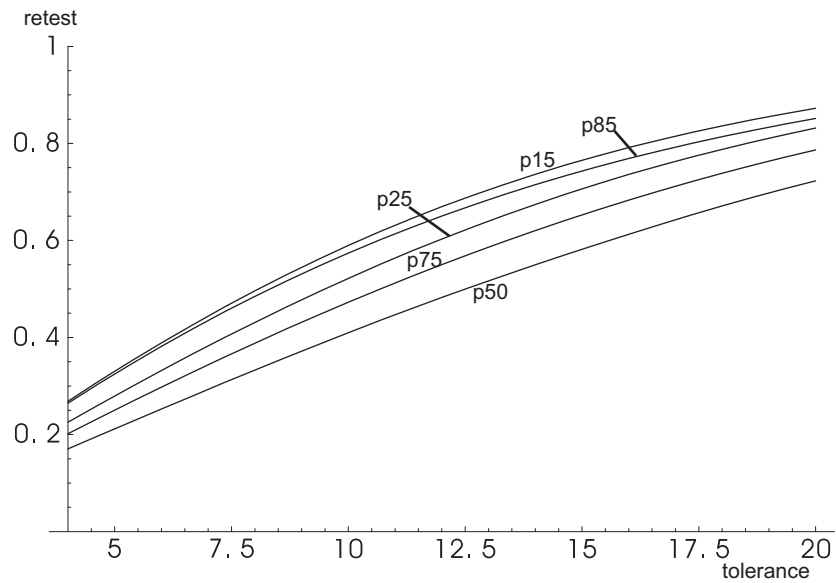


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.985	65	0.346
40	0.916	70	0.208
50	0.754	80	0.066
55	0.638	90	0.013

Test-Retest Accuracy Language Grade 4

p	tolerance			
	5	10	15	20
10	0.41	0.67		
15	0.33	0.59	0.77	
20	0.3	0.54	0.73	
25	0.28	0.52	0.71	0.83
30	0.26	0.48	0.66	0.8
35	0.23	0.44	0.62	0.75
40	0.22	0.43	0.6	0.74
45	0.22	0.42	0.6	0.74
50	0.21	0.41	0.58	0.72
55	0.21	0.41	0.58	0.72
60	0.21	0.41	0.59	0.73
65	0.22	0.43	0.6	0.74
70	0.24	0.46	0.64	0.77
75	0.25	0.47	0.65	0.79
80	0.28	0.51	0.69	
85	0.32	0.57	0.74	
90	0.41	0.66		



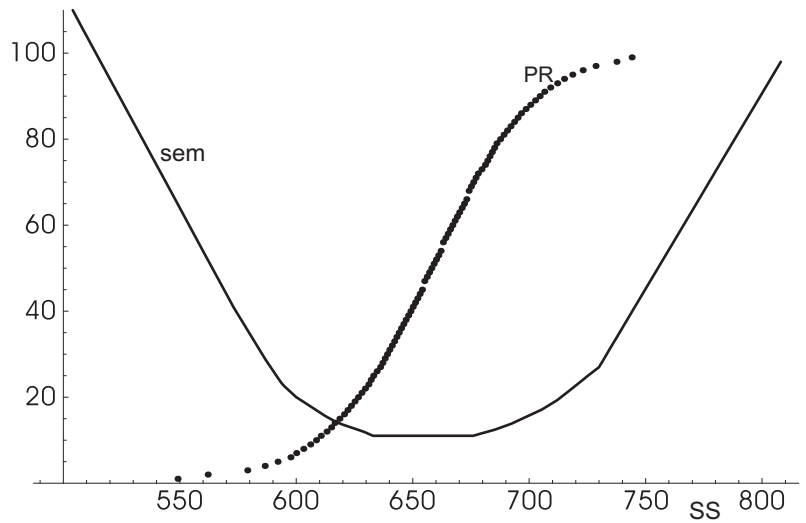
Compare Two Students

	true percentiles (student1, student2)		
Probability of reversal	(50, 75)	(25, 75)	(50, 90)
	.094	.004	.013

CAT/6 Survey Language Grade 6

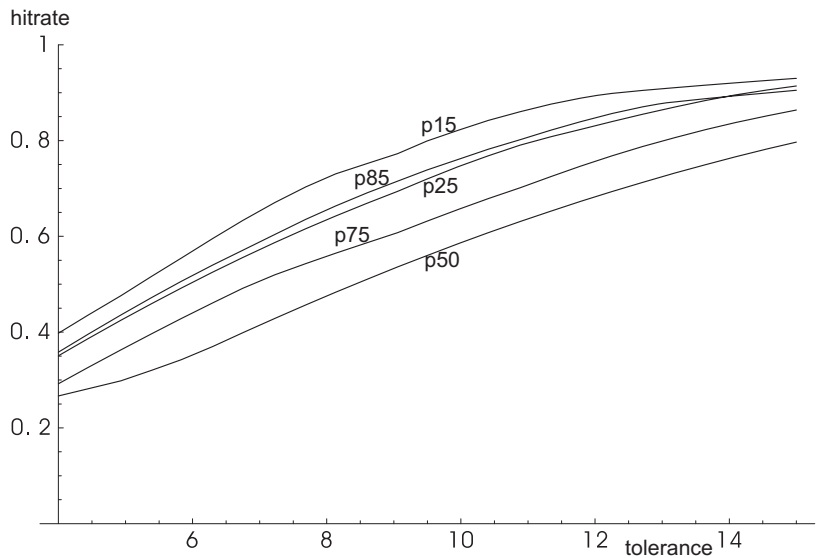
Describing percentile rank (p) and standard error of measurement (sem)
 KR20 test reliability .88 for 29 items

p	SS	sem
5	592.	24.6
10	608.5	16.71
15	618.5	13.9
20	626.5	12.42
25	633.	11.
30	639.	11.
35	644.	11.
40	649.	11.
45	654.	11.
50	658.	11.
55	662.5	11.
60	667.	11.
65	672.	11.
70	676.	11.
75	682.	12.
80	687.5	12.79
85	695.	14.5
90	704.5	16.88
95	718.5	22.07



HITRATE Accuracy Language Grade 6

p	tolerance			
	5	7.5	10	15
10	0.56	0.79		
15	0.48	0.69		
20	0.44	0.63	0.77	0.92
25	0.43	0.6	0.75	0.91
30	0.38	0.54	0.69	0.88
35	0.35	0.5	0.66	0.84
40	0.35	0.48	0.61	0.82
45	0.32	0.48	0.6	0.8
50	0.3	0.45	0.59	0.8
55	0.32	0.48	0.59	0.78
60	0.33	0.45	0.59	0.8
65	0.32	0.48	0.62	0.82
70	0.35	0.5	0.65	0.85
75	0.37	0.53	0.66	0.86
80	0.39	0.58	0.72	0.88
85	0.44	0.62		
90	0.51	0.74		

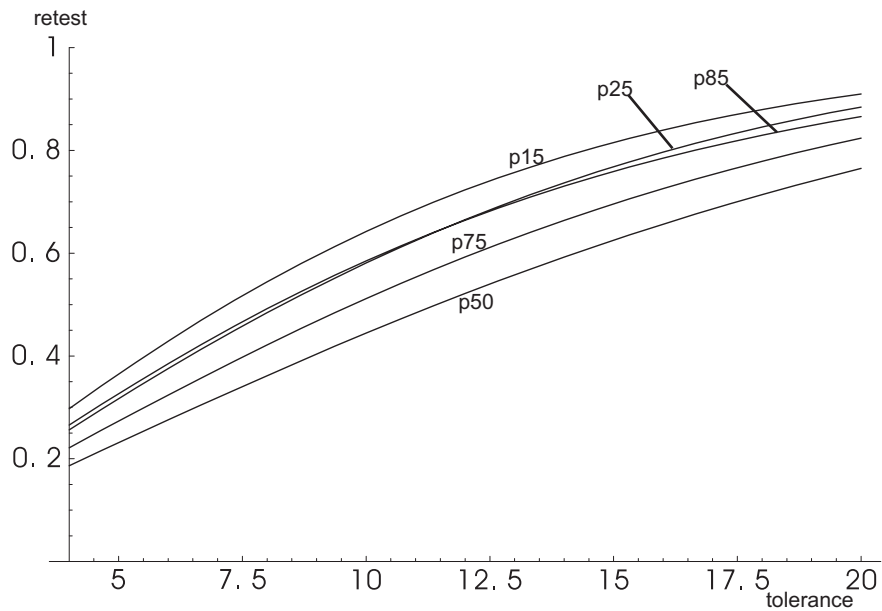


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.994	65	0.309
40	0.944	70	0.194
50	0.78	80	0.05
55	0.642	90	0.012

Test-Retest Accuracy Language Grade 6

p	tolerance			
	5	10	15	20
10	0.42	0.69		
15	0.36	0.64	0.82	
20	0.33	0.6	0.78	
25	0.32	0.58	0.77	0.88
30	0.28	0.53	0.72	0.84
35	0.26	0.49	0.68	0.81
40	0.24	0.47	0.65	0.79
45	0.24	0.45	0.63	0.77
50	0.23	0.44	0.63	0.76
55	0.23	0.44	0.63	0.76
60	0.24	0.45	0.63	0.77
65	0.25	0.47	0.66	0.79
70	0.26	0.49	0.68	0.82
75	0.27	0.51	0.7	0.82
80	0.3	0.54	0.73	
85	0.33	0.59	0.76	
90	0.39	0.65		



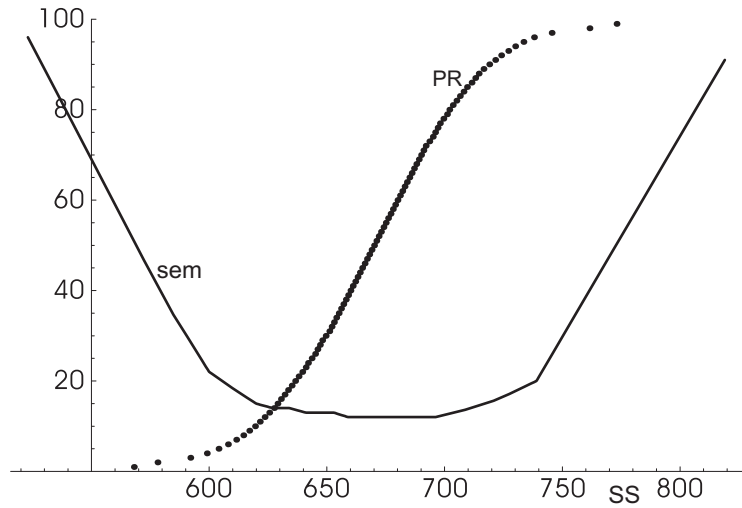
Compare Two Students

	true percentiles (student1, student2)
Probability of reversal	(50, 75) (25, 75) (50, 90)
	.070 .001 .010

CAT/6 Survey Language Grade 8

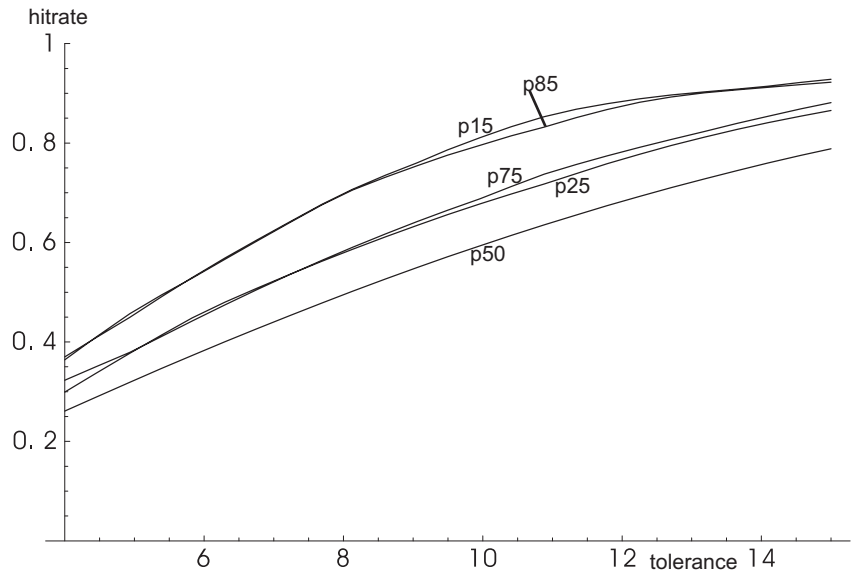
Describing percentile rank (p) and standard error of measurement (sem)
 KR20 test reliability .87 for 26 items

p	SS	sem
5	604.	20.55
10	619.5	15.17
15	629.	14.
20	636.5	13.64
25	643.5	13.
30	649.5	13.
35	655.	12.67
40	660.	12.
45	665.	12.
50	670.	12.
55	675.	12.
60	680.	12.
65	685.	12.
70	690.	12.
75	696.	12.
80	702.	12.86
85	709.5	13.72
90	719.	15.27
95	733.5	18.62



HITRATE Accuracy Language Grade 8

p	tolerance			
	5	7.5	10	15
10	0.58	0.8		
15	0.46	0.66		
20	0.4	0.58	0.72	0.9
25	0.38	0.55	0.68	0.87
30	0.34	0.49	0.63	0.83
35	0.32	0.47	0.6	0.81
40	0.32	0.47	0.61	0.81
45	0.32	0.47	0.6	0.8
50	0.32	0.47	0.6	0.79
55	0.32	0.47	0.6	0.79
60	0.32	0.47	0.6	0.8
65	0.32	0.47	0.62	0.82
70	0.35	0.5	0.64	0.84
75	0.38	0.55	0.69	0.88
80	0.4	0.58	0.73	0.9
85	0.46	0.66		
90	0.56	0.8		

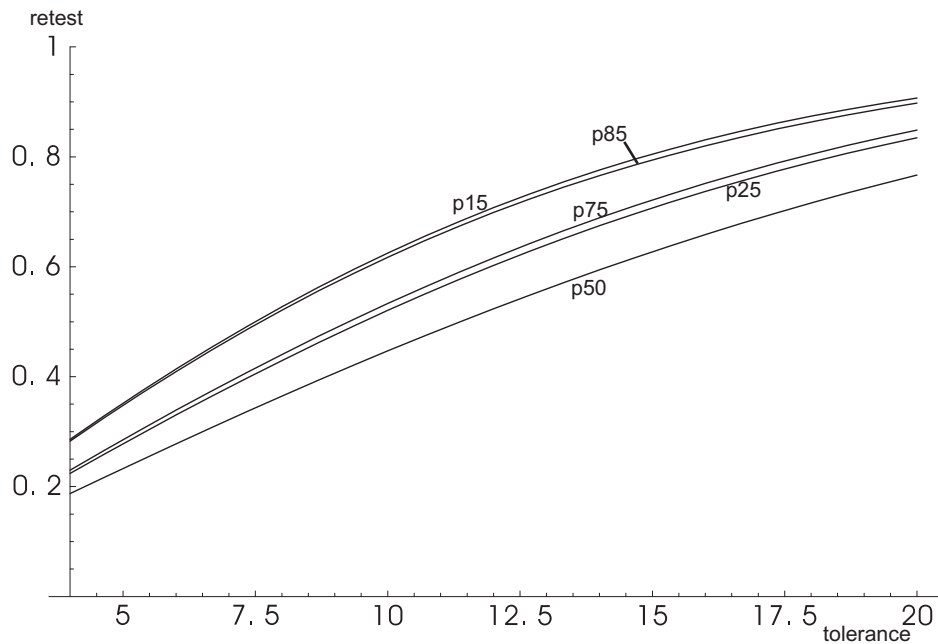


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.989	65	0.323
40	0.948	70	0.191
50	0.786	80	0.04
55	0.646	90	0.005

Test-Retest Accuracy Language Grade 8

p	tolerance			
	5	10	15	20
10	0.44	0.71		
15	0.35	0.63	0.8	
20	0.3	0.56	0.75	
25	0.28	0.52	0.71	0.83
30	0.25	0.48	0.66	0.8
35	0.24	0.46	0.64	0.78
40	0.24	0.46	0.64	0.78
45	0.23	0.45	0.63	0.77
50	0.23	0.45	0.63	0.77
55	0.23	0.45	0.63	0.77
60	0.24	0.45	0.64	0.78
65	0.24	0.47	0.65	0.79
70	0.26	0.49	0.68	0.81
75	0.29	0.53	0.72	0.85
80	0.3	0.56	0.75	
85	0.35	0.62	0.79	
90	0.43	0.7		



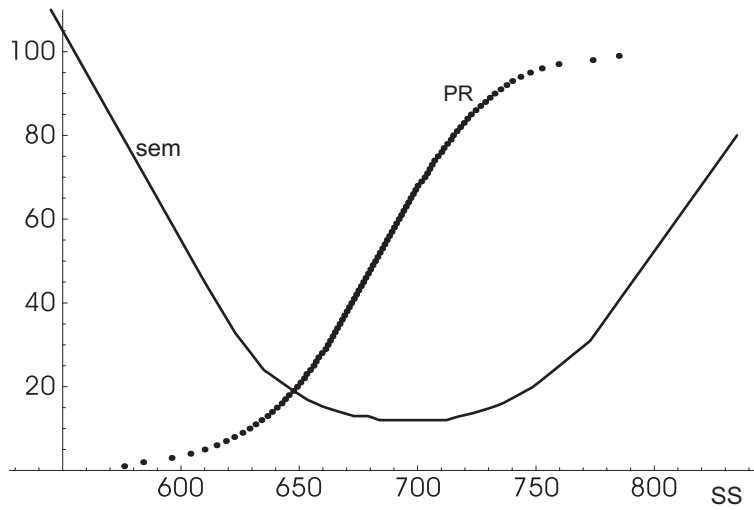
Compare Two Students

Probability of reversal	true percentiles (student1, student2)		
	(50, 75)	(25, 75)	(50, 90)
	.062	.001	.006

CAT/6 Survey Language Grade 10

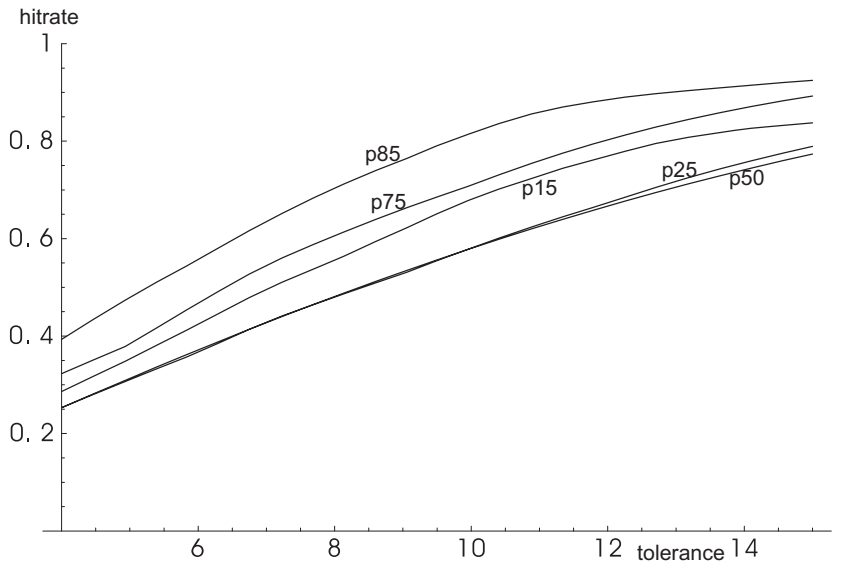
Describing percentile rank (p) and standard error of measurement (sem)
 KR20 test reliability .86 for 26 items

p	SS	sem
5	610.	45.
10	629.	28.4
15	640.5	21.8
20	649.	18.5
25	656.	16.25
30	662.	14.83
35	667.	14.
40	672.	13.17
45	677.	13.
50	682.	12.4
55	687.	12.
60	692.	12.
65	697.	12.
70	703.	12.
75	708.5	12.
80	715.	12.5
85	722.5	13.56
90	732.5	15.3
95	747.5	19.54



HITRATE Accuracy Language Grade 10

p	tolerance			
	5	7.5	10	15
10	0.41	0.63		
15	0.35	0.53		
20	0.32	0.47	0.62	0.82
25	0.31	0.46	0.58	0.79
30	0.29	0.43	0.56	0.77
35	0.28	0.43	0.55	0.76
40	0.3	0.43	0.55	0.76
45	0.3	0.44	0.56	0.75
50	0.31	0.45	0.58	0.77
55	0.32	0.47	0.6	0.8
60	0.32	0.47	0.62	0.81
65	0.35	0.49	0.63	0.83
70	0.37	0.53	0.66	0.86
75	0.38	0.58	0.71	0.89
80	0.42	0.62	0.75	0.92
85	0.48	0.67		
90	0.58	0.8		

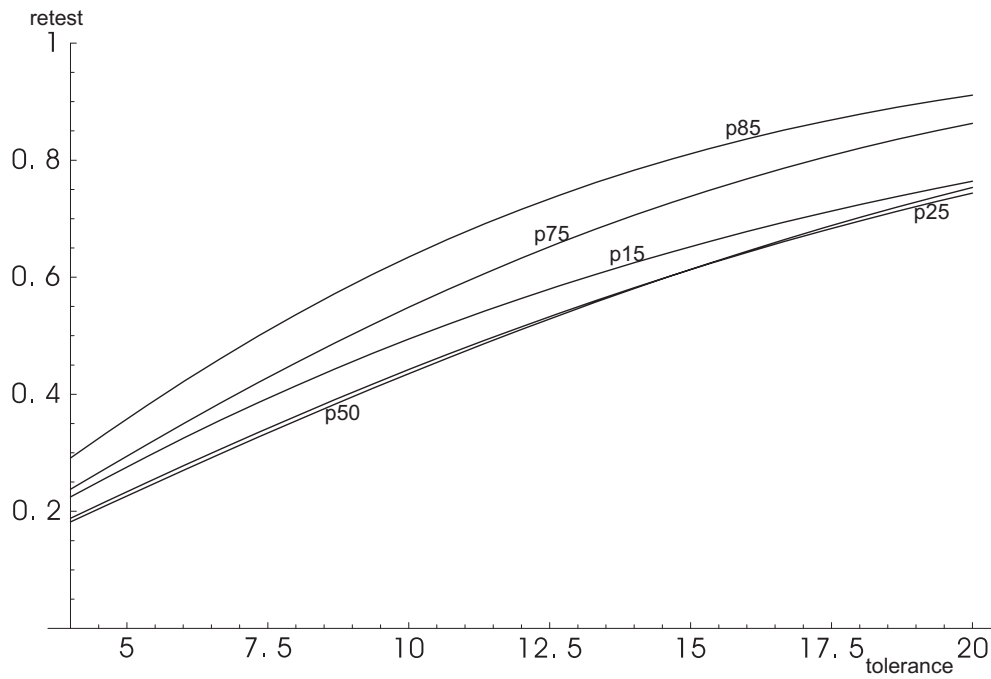


"Proficient" (at 60th percentile) approximation

percentile	Prob < 60th	percentile	Prob < 60th
30	0.977	65	0.323
40	0.931	70	0.169
50	0.778	80	0.03
55	0.646	90	0.004

Test-Retest Accuracy Language Grade 10

p	tolerance			
	5	10	15	20
10	0.31	0.53		
15	0.28	0.49	0.65	
20	0.25	0.46	0.63	
25	0.23	0.44	0.61	0.74
30	0.22	0.43	0.6	0.74
35	0.22	0.42	0.59	0.73
40	0.22	0.42	0.6	0.74
45	0.22	0.42	0.59	0.73
50	0.23	0.44	0.61	0.75
55	0.24	0.45	0.63	0.77
60	0.24	0.46	0.64	0.78
65	0.25	0.48	0.66	0.8
70	0.27	0.51	0.7	0.83
75	0.29	0.55	0.74	0.86
80	0.32	0.59	0.77	
85	0.36	0.63	0.81	
90	0.43	0.71		



Compare Two Students

Probability of reversal	true percentiles (student1, student2)		
	(50, 75)	(25, 75)	(50, 90)
	.062	.004	.005

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<http://www.stanford.edu/~rag/cse/shoeshop.html>