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Effect of Comparability of Examinee Groups on Equating

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ABSTRACT

Multiple forms of large scale assessment and certification tests are often equated using an internal anchor. This study examines the effects of using comparable equating samples on the new and link tests as opposed to using a larger, but less comparable, link sample for the Tucker, Levine, and Braun-Holland linear methods, and the unsmoothed equipercentile method. The results from the study were mixed, tending to suggest that an equating relationship based on comparable groups may be preferable in some instances, but not in others.

EFFECT OF COMPARABILITY OF EXAMINEE GROUPS ON EQUATING

Multiple forms of large scale assessment and certification tests are constructed from the same specifications to be as similar as possible in their statistical and content characteristics. Equating is used in testing programs that require multiple forms in order to convert scores on the multiple forms of a test to a common score scale so the forms may be used interchangeably. One popular method of equating tests from different administrations uses an internal anchor.

Anchor test equating requires parameters to be estimated for both examinee populations--that taking the current form and that taking the previous (or link) form. One view of equating accuracy is that the larger the sample used to estimate these parameters, the more stable the estimates will be and, therefore, the more stable the equating relationship. Also of concern in the present situation, however, is the similarity of the two examinee groups. Although the entire group of examinees who were administered the link form is available, due to time constraints (e.g., pressure for prompt reporting of test results to examinees), it is often impractical to wait until all current examinees are available (e.g., until all answer sheets are returned from test centers, scanned, edited, etc.) to conduct equating. Therefore, equating is often conducted using either all examinees available at the time it is decided to conduct equating, or using a prespecified sample of examinees, such as the examinees tested in 6 or 7 test centers that are known to be prompt in returning test answer sheets. The practical equating question is what group or subgroup of past examinees should be used to equate the present test form to the previous test form--the larger (more stable) group or the smaller, more comparable subgroup. This study examined this issue using a

large scale certification test and the Tucker, Levine, and Braun-Holland linear equating methods, and the unsmoothed equipercentile method.

Background

Although related studies do exist in the literature, for the most part their focus has been on comparing the results of different equating methods over various equating subgroups. Marco, Petersen, and Stewart (1983a; 1983b) and Petersen, Marcc, and Stewart (1982), for example, compared several equating methods over numerous equating conditions, such as the use of an internal or external anchor, the difference in difficulty between the two test forms, and the similarity or dissimilarity of the equating subgroups. Marco, Petersen, and Stewart found (1983a, p. 175): "The kinds of samples have a relatively small and unsystematic effect on the quality of the equating results if the anchor test is similar in content and in difficulty to the total tests."

Angoff and Cowell (1985), using a random groups design, investigated the assumption of population independence, that is, whether the characteristics of the populations used for establishing the equating relationship have an effect on the equating outcome. They concluded (p. ii) "The assumption of population independence for equating is supportable for homogenous tests." Harris and Kolen (1986) found the effect of using extreme ability groups to establish an equating relationship to have minimal effect in a random groups design.

These studies taken together suggest that the particular subpopulation used to establish an equating relationship may not have a large effect on that relationship, especially if the tests to be equated are very similar, and a representative internal anchor is used. This premise will be examined in the present study.

Equating Methods

Four methods of equating are considered here: Three linear methods and the unsmoothed equipercentile method. The common item equating design with nonequivalent populations requires one sample of examinees to take test form X and test form V, and a second sample to take test form Y and test form V.

Tucker Method

The Tucker method is based on the following assumptions (Levine, 1955; Kolen, 1985a):

i) The linear regression equation of X on V is the same for both populations of examinees; the linear regression equation of Y on V is the same for both populations of examinees.

ii) The variance of errors of estimating X from V is the same in both populations of examinees. The variance of errors of estimating Y from V are the same in both populations of examinees.

Levine Method

The Levine method is based on the following assumptions (Levine, 1955; Kolen, 1985a):

i) The correlations between the true scores on X and the true scores on V are equal to one in both populations. The correlations between the true scores on Y and the true scores on V are equal to 1 in both populations.

ii) The linear regression equation of the true scores on X and true scores on V are the same for both populations. The linear regression equation of the true scores on Y and true scores on V are the same for both populations.

iii) The standard error of measurement for X is the same for both populations. The standard error of measurement for Y is the same for both populations.

iv) The standard error of measurement for V is the same for both populations.

v) The error variances as defined by Angoff (1953) hold.

Braun-Holland Method

The Braun-Holland method is based on the following assumptions (Braun and Holland, 1982; Kolen, 1985a):

i) The regression of X on V is the same for both populations, the regression of Y on V is the same for both populations. This regression is not, however, constrained to be linear.

ii) The variance of errors of estimating X from V are the same in both populations; the variance of errors of estimating Y from V are the same in both populations.

Equipercentile Method

The equipercentile method is a nonlinear equating method, and assumes that the conditional cumulative distribution of X given V is the same for both populations as is Y given V (Braun and Holland, 1982; Jarjoura and Kolen, 1984; Angoff, 1971).

Method

Item data from three forms of a 200-item multiple choice certification test were used. Items were dichotomously scored, and number right scoring was employed. The test forms were designed to meet the same content and statistical specifications. A 29-item internal anchor was used to equate the new form to the link 1 form; a 30-item internal anchor was used to equate the

new form to the link 2 form. The anchors were designed to be representative, both in content and statistically, of the entire test forms. The new test and link 1 were administered two years apart; the new test and link 2 were administered three-and-one-half years apart. Usable test data were available on 39,149 examinees taking the new form, 37,990 examinees taking link form 1 and 18,077 examinees taking link form 2. Test administration is done through testing centers, which coordinate the testing in their geographic regions.

To establish a criterion against which to evaluate the results of the various equatings, the total samples of new and link examinees were used for each link form, with an equating relationship being established using each of the four equating methods, hereafter to be referred to as TT. Because of the desirability of reporting scores as quickly as possible, which requires the equating function to be established as soon after test administration as possible, three equating subgroups were formed on the basis of when the answer sheets were returned after test administration to be scanned. The first subgroup consists of all examinees from test centers returning answers on or before the fifth day after the test date. The second subgroup consists of all answer sheets received on or before day six, and the third subgroup, those answer sheets received on or before day nine. Equating relationships were established using comparable subgroups (i.e., the same test centers) from both examinee populations as well as the subgroup on the new test and the total group on the link test. For example, the equating relationships using the answer sheets received through the fifth day after the test date on the new form to the comparable group on the link form will be subsequently designated 55. The use of the fifth-day subgroup on the new form and the total group on the link form will be designated 5T. Similarly, 66, 6T, 99, and 9T are the equatings involving the other two subgroups mentioned above.

Four additional subgroups were examined. The first is based on including only large test centers, with large being those overseeing 1000 or more examinees (LL and LT). The second consists of a subset of seven test centers that had, in the past, been targeted as equating test centers (77 and 7T). The third consists of southern test centers (SS and ST). The last subgroup consists of test centers in the east coast region (CC and CT).

Several indices were used to examine the relationships between the equatings. The first index is the root mean square, defined as:

$$RMS = \left[\frac{\Sigma_i f_i (A_i - B_i)^2}{\Sigma_i f_i} \right]^{\frac{1}{2}}$$

where A_i and B_i are the link test equivalents of a raw score of i on the new test established using two different equating relationships (for example, A_i is from 55 and B_i is from TT),

f_i is the frequency of a raw score of i on the new test, and

i runs from 0 to 200.

The second index is the mean absolute difference, and is defined as:

$$MA = \frac{\Sigma_i f_i \left| A_i - B_i \right|}{\Sigma_i f_i} \quad .$$

The third index is the mean signed difference, and is defined as:

$$MS = \frac{\Sigma_i f_i (A_i - B_i)}{\Sigma_i f_i} \quad .$$

Weighting the differences in the above indices allows relatively more weight to be given to score point differences that occur frequently, and no weight to differences in the extremes of the score range where no examinees

scored. However, it was also thought desirable to examine differences that occurred throughout the score scale, so the indices were also computed without weighting, namely:

$$RMS_u = \left[\frac{\Sigma_i (A_i - B_i)^2}{K} \right] 1/2$$

$$MA_u = \frac{\Sigma_i \left| A_i - B_i \right|}{K}$$

$$MS_u = \frac{\Sigma_i (A_i - B_i)}{K}$$

where K is the number of score points, 201 in the present study, and the other terms are as defined above.

Results

Table 1 displays the number of examinees and the test score moments for each of the subgroups examined here on the new and both link forms.

Table 2 lists selected raw score equivalents for each of the four equating methods based on the criterion equations of total new group to total link group. Also given are the standard errors associated with the estimates for the Tucker, Levine, and unsmoothed equipercentile methods (see Jarjoura and Kolen, 1985, and Kolen 1985a, 1985b for derivations of the standard errors; expressions for the standard errors of the Braun-Holland method have not been derived.)

Table 3 gives the means and standard deviations for the new and link groups under each of the equating methods.

Tables 4 through 17 provide conversion tables for the various subgroup-to-subgroup and subgroup-to-total equatings. An examination of these tables shows that differences, sometimes on the magnitude of over two raw score points, exist between the equating relationship established using a subgroup on the new test to the comparable subgroup on the link test and using the subgroup on the new test and the total available group on the link test. Differences in the middle of the score range, where most of the examinees actually score are, as expected, less than the differences at the ends. Table 18 gives the slopes and intercepts of the conversion equating used to obtain the data for the linear equating methods in Tables 4 through 17.

To summarize these differences, the root mean square, mean absolute difference, and mean signed difference for the unweighted comparisons appear in Tables 19 through 22 for the Tucker, Levine, Braun-Holland and unsmoothed equipercentile methods, respectively. The weighted comparisons appear in Tables 23 through 26.

Table 27 summarizes the above data by listing the "best" linking group for both link forms and all four equating methods, based on the lowest root mean squared error. The equating comparison of, for example, 55 to 5T is given for completeness, and provides an indication of how different the equating relationships are when the comparable subgroup on the link form is used as opposed to the total available group on the link form. Of primary interest in this study are the two criterion comparisons, namely, for example, 55-TT and 5T-TT. The results are mixed. For the subgroup based on large test centers (L), the equatings are "better," in terms of a smaller root mean square difference from the criterion, when the total link population is used,

as opposed to using the comparable subgroup of large test centers. This finding holds across all four equating methods and across both link forms. For the subgroup based on seven test centers (7) used for equating in the past the opposite result is found for link 1: smaller root mean square differences from the criterion result from using the comparable subgroup on the link rather than from using the group of total available examinees on the link. This also holds for two link 2 methods.

The subgroup formed by including test centers whose answer sheets had been returned for scanning by day five (5) tends to support the use of the total available group on the link; the subgroup based on test centers returning answer sheets by day nine (9) tends to support the use of the comparable link sample for link 1 and the total available group for link 2, as does the southern subgroup (S). Data for the subgroup based on test centers returning answer sheets by day six (6) are mixed. The coastal subgroup (C) tends to support the use of the total available group. In general, the four equating methods provide similar recommendations as to which subgroups are better paired with comparable link subgroups, and which are better paired with the total available link group. The differences can be quite large, with the difference for the Levine method between the root mean square for 55 using link form 1 and that of the criterion being 2.37 and the root mean square for 5T and the criterion being .76, though most of the differences are less extreme.

Table 27 summarizes the above data by listing the "best" linking group for both link forms and all four equating methods, based on the lowest root mean squared error.

Summary

This study investigated the effect of the comparability of the examinee groups on the new and link tests used to establish a horizontal equating relationship based on the Tucker, Levine, and Braun-Holland linear methods and the unsmoothed equipercentile method. The results indicate that, using the criterion of total available group to total available group equating, it is at times preferable to use a smaller comparable link sample and at times it is preferable to use the larger, less comparable group of all available link examinees. On link 1, no clearly discernible pattern was observed for the conditions under which equating the subgroup on the link would be preferable; for the majority of cases on link 2, the total available group was preferred, which might be due to the smaller number of examinees administered this form, or the fact that the link-2 examinees are less similar to the new-form examinees than are the link 1 examinees.

It should be recalled that this study dealt with only three 200 item test forms, and these three forms were constructed to be as similar as possible in statistical and content characteristics; the tests were equated using a representative internal anchor, and only select subgroups were examined. More research obviously needs to be conducted over a wider range of conditions to attempt some generalizations as to when it is, and when it is not, advisable to use a comparable link sample.

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TABLE 1

Test Score Moments for Equating Groups

	N	Mean	Standard Deviation	Skewness	Kurtosis
New Form					
Total	39,149	127.88	16.74	-.32	3.10
5	3,361	128.11	16.28	-.30	3.09
6	21,040	128.25	16.60	-.33	3.13
9	27,485	128.07	16.56	-.30	3.10
L	28,207	127.69	16.73	-.32	3.10
7	6,475	126.38	16.98	-.31	3.11
S	4,781	124.94	16.56	-.25	3.03
C	13,673	127.97	17.32	-.34	3.02
Link Form 1					
Total	37,990	128.72	18.07	-.28	3.05
5	3,250	129.19	17.14	-.13	2.81
6	19,812	129.08	18.24	-.27	3.09
9	25,988	128.75	18.02	-.25	3.06
L	26,632	128.80	17.89	-.25	3.04
7	7,183	127.36	18.36	-.29	2.95
S	4,478	123.89	18.92	-.24	3.10
C	13,811	129.49	17.99	-.34	3.07
Link Form 2					
Total	18,077	123.44	17.68	-.21	3.14
5	960	124.53	17.69	-.20	3.06
6	10,912	124.93	17.39	-.26	3.17
9	13,309	124.61	17.40	-.23	3.11
L	12,635	123.19	17.06	-.22	3.24
7	3,504	122.97	18.15	-.11	2.99
S	3,006	121.03	19.08	-.18	2.90
C	5,066	120.42	18.17	-.12	3.22

TABLE 2

Selected Raw Score Equivalents and Standard Errors for T-T

New Form Score	N	Link Form 1 Scores				Link Form 2 Scores			
		Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
0		-6.90 (.56)	-4.06 (.88)	-6.39	-0.01 (***)	-4.11 (.68)	3.96 (1.04)	-3.21	-0.01 (***)
5		-1.55 (.53)	1.20 (.84)	-1.06	4.94 (***)	1.05 (.65)	8.92 (1.00)	1.92	4.94 (***)
10		3.80 (.51)	6.47 (.81)	4.26	9.89 (***)	6.22 (.62)	13.88 (.96)	7.04	9.88 (***)
15		9.15 (.49)	11.74 (.78)	9.59	14.84 (***)	11.38 (.60)	18.84 (.92)	12.17	14.83 (***)
20		14.50 (.47)	17.00 (.74)	14.92	19.79 (***)	16.54 (.57)	23.81 (.87)	17.30	19.77 (***)
25		19.85 (.45)	22.27 (.71)	20.25	24.74 (***)	21.71 (.55)	28.77 (.83)	22.43	24.72 (***)
30		25.20 (.43)	27.54 (.67)	25.58	29.68 (***)	26.87 (.52)	33.73 (.79)	27.56	29.66 (***)
35		30.54 (.41)	32.80 (.64)	30.91	34.63 (***)	32.04 (.49)	38.70 (.75)	32.68	34.61 (***)
40		35.89 (.39)	38.07 (.61)	36.24	39.58 (***)	37.20 (.47)	43.66 (.71)	37.81	39.55 (***)
45		41.24 (.37)	43.34 (.57)	41.57	44.53 (***)	42.36 (.44)	48.62 (.67)	42.94	44.50 (***)
50		46.59 (.35)	48.60 (.54)	46.90	49.48 (***)	47.53 (.42)	53.58 (.63)	48.07	49.44 (***)
55	2	51.94 (.33)	53.87 (.51)	52.23	54.42 (***)	52.69 (.39)	58.55 (.59)	53.20	54.39 (***)
60	3	57.29 (.31)	59.14 (.48)	57.56	59.37 (***)	57.86 (.37)	63.51 (.55)	58.33	59.33 (***)
65	1	62.64 (.29)	64.40 (.44)	62.89	64.32 (***)	63.02 (.34)	68.47 (.51)	63.45	64.28 (***)
70	7	67.99 (.27)	69.67 (.41)	68.21	69.27 (***)	68.19 (.32)	73.43 (.47)	68.58	69.22 (***)
75	11	73.33 (.24)	74.94 (.38)	73.54	74.22 (***)	73.35 (.29)	78.40 (.43)	73.71	74.17 (***)
80	18	78.68 (.23)	80.20 (.34)	78.87	79.17 (.69)	78.51 (.27)	83.36 (.39)	78.84	79.11 (.64)
85	49	84.03 (.21)	85.47 (.31)	84.20	84.45 (.50)	83.68 (.24)	88.32 (.36)	83.97	83.33 (.55)
90	101	89.38 (.19)	90.73 (.28)	89.53	90.59 (.39)	88.84 (.22)	93.28 (.32)	89.09	89.63 (.49)
95	132	94.73 (.17)	96.00 (.25)	94.86	95.43 (.28)	94.01 (.19)	98.25 (.28)	94.22	94.90 (.34)
100	240	100.08 (.15)	101.27 (.22)	100.19	100.53 (.23)	99.17 (.17)	103.21 (.24)	99.35	99.95 (.26)
105	384	105.43 (.13)	106.53 (.19)	105.52	105.93 (.20)	104.33 (.15)	108.17 (.21)	104.48	104.89 (.22)
110	487	110.78 (.12)	111.80 (.16)	110.85	110.86 (.16)	109.50 (.13)	113.14 (.18)	109.61	109.84 (.20)
115	693	116.13 (.10)	117.07 (.14)	116.18	116.05 (.15)	114.66 (.12)	118.10 (.15)	114.74	114.81 (.16)
120	781	121.47 (.09)	122.33 (.12)	121.51	121.06 (.13)	119.83 (.11)	123.06 (.14)	119.86	119.63 (.16)
125	841	126.82 (.08)	127.60 (.10)	126.83	126.33 (.13)	124.99 (.10)	128.02 (.13)	124.99	124.58 (.15)

(continued)

Table 2 (cont.)

New Form Score		Link Form 1 Scores				Link Form 2 Scores			
		Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
130	883	132.17 (.08)	132.87 (.10)	132.16	132.05 (.13)	130.15 (.10)	132.99 (.14)	130.12	129.81 (.15)
135	873	137.52 (.08)	138.13 (.11)	137.49	137.38 (.13)	135.32 (.11)	137.95 (.15)	135.25	134.85 (.16)
140	791	142.87 (.09)	143.40 (.13)	142.82	142.82 (.13)	140.48 (.12)	142.91 (.18)	140.38	140.05 (.18)
145	594	148.22 (.10)	148.67 (.15)	148.15	148.49 (.14)	145.65 (.14)	147.87 (.21)	145.50	145.56 (.20)
150	438	153.57 (.12)	153.93 (.18)	153.48	153.82 (.17)	150.81 (.16)	152.84 (.24)	150.63	151.28 (.27)
155	246	158.92 (.13)	159.20 (.21)	158.81	159.12 (.21)	155.97 (.18)	157.80 (.28)	155.76	156.43 (.26)
160	132	164.26 (.15)	164.47 (.24)	164.14	164.40 (.26)	161.14 (.20)	162.76 (.31)	160.89	161.46 (.38)
165	56	169.61 (.17)	169.73 (.27)	169.47	169.55 (.36)	166.30 (.23)	167.72 (.35)	166.02	168.56 (.60)
170	17	174.96 (.19)	175.00 (.30)	174.80	173.91 (***)	171.47 (.25)	172.69 (.39)	171.15	173.06 (***)
175	1	180.31 (.21)	180.27 (.33)	180.13	178.27 (***)	176.63 (.28)	177.65 (.43)	176.27	177.55 (***)
180		185.66 (.23)	185.53 (.36)	185.45	182.63 (***)	181.80 (.30)	182.61 (.47)	181.40	182.05 (***)
185		191.01 (.25)	190.80 (.39)	190.78	186.99 (***)	186.96 (.33)	187.58 (.51)	186.53	186.55 (***)
190		196.36 (.27)	196.07 (.43)	196.11	191.35 (***)	192.12 (.35)	192.54 (.55)	191.66	191.05 (***)
195		201.71 (.29)	201.33 (.46)	201.44	195.70 (***)	197.29 (.38)	197.50 (.59)	196.79	195.55 (***)
200		207.05 (.31)	206.60 (.49)	206.77	200.06 (***)	202.45 (.40)	202.46 (.63)	291.92	200.05 (***)

***Standard error not available

TABLE 3

Means and Standard Deviations for Equating Groups Based on Total-Total Equating

	Equating Method			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
New Form	129.32(18.00)	129.69(17.87)	129.32(17.97)	129.32(17.97)
Link 1	127.34(16.82)	126.98(16.97)	127.34(16.86)	127.34(16.86)
New Form	126.53(17.54)	128.55(17.29)	127.52(17.48)	126.52(17.48)
Link 2	126.49(16.98)	125.53(17.42)	126.49(17.04)	126.49(17.04)

TABLE 4

Selected Raw Score Equivalents and Standard Errors on Link Form 1 for 5-5 and 5-T Equatings

New Form Score	5-5 Tucker	5-5 Levine	5-5 Braun-Holland	5-5 Unsmoothed Equipercentile	5-T Tucker	5-T Levine	5-T Braun-Holland	5-T Unsmoothed Equipercentile
0	-6.41 (1.89)	-7.75 (3.18)	-6.85	0.00 (***)	-9.68 (1.47)	-4.02 (2.25)	-9.35	-0.01 (***)
5	-1.12 (1.82)	-2.41 (3.05)	-1.54	5.01 (***)	-4.24 (1.42)	1.21 (2.17)	-3.93	4.88 (***)
10	4.17 (1.74)	2.93 (2.93)	3.76	10.01 (***)	1.19 (1.36)	6.44 (2.08)	1.49	9.76 (***)
15	9.46 (1.67)	8.27 (2.81)	9.07	15.02 (***)	6.62 (1.31)	11.67 (2.00)	6.91	14.65 (***)
20	14.75 (1.60)	13.61 (2.69)	14.38	20.02 (***)	12.06 (1.25)	16.91 (1.91)	12.33	19.54 (***)
25	20.04 (1.53)	18.95 (2.57)	19.68	25.03 (***)	17.49 (1.19)	22.14 (1.82)	17.75	24.43 (***)
30	25.33 (1.46)	24.29 (2.45)	24.99	30.03 (***)	22.92 (1.14)	27.37 (1.74)	23.17	29.32 (***)
35	30.62 (1.39)	29.63 (2.33)	30.30	35.04 (***)	28.35 (1.08)	32.60 (1.65)	28.60	34.20 (***)
40	35.91 (1.32)	34.97 (2.21)	35.60	40.04 (***)	33.79 (1.03)	37.83 (1.57)	34.02	39.09 (***)
45	41.20 (1.25)	40.31 (2.09)	40.91	45.05 (***)	39.22 (.98)	43.07 (1.48)	39.44	43.98 (***)
50	46.49 (1.18)	45.65 (1.97)	46.22	50.06 (***)	44.65 (.92)	48.30 (1.40)	44.86	48.87 (***)
55	51.78 (1.11)	50.99 (1.85)	51.52	55.06 (***)	50.09 (.87)	53.53 (1.31)	50.28	53.76 (***)
60	57.07 (1.04)	56.33 (1.73)	56.83	60.07 (***)	55.52 (.81)	58.76 (1.23)	55.70	58.64 (***)
65	62.36 (.97)	61.67 (1.61)	62.14	65.07 (***)	60.95 (.76)	64.00 (1.14)	61.12	63.53 (***)
70	67.65 (.90)	67.01 (1.49)	67.44	70.08 (***)	66.38 (.70)	69.23 (1.06)	66.54	68.42 (***)
75	72.94 (.83)	72.35 (1.38)	72.75	75.08 (***)	71.82 (.65)	74.46 (.97)	71.97	73.31 (***)
80	78.23 (.77)	77.69 (1.26)	78.06	80.09 (***)	77.25 (.60)	79.69 (.89)	77.39	78.20 (***)
85	83.52 (.70)	83.03 (1.14)	83.36	86.52 (1.79)	82.68 (.55)	84.92 (.81)	82.81	84.10 (1.39)
90	88.81 (.63)	88.37 (1.03)	88.67	89.98 (1.21)	88.12 (.49)	90.16 (.73)	88.23	89.04 (1.17)
95	94.10 (.57)	93.71 (.91)	93.98	94.26 (1.09)	93.55 (.44)	95.39 (.65)	93.65	94.19 (.73)
100	99.39 (.51)	99.05 (.80)	99.28	99.75 (.88)	98.98 (.40)	100.62 (.57)	99.07	98.98 (.61)
105	104.68 (.45)	104.40 (.70)	104.59	105.47 (.62)	104.41 (.35)	105.85 (.49)	104.49	104.90 (.52)
110	109.97 (.39)	109.74 (.59)	109.90	110.22 (.59)	109.85 (.31)	111.08 (.42)	109.92	110.12 (.40)
115	115.26 (.35)	115.08 (.50)	115.20	115.24 (.44)	115.28 (.27)	116.32 (.36)	115.34	115.25 (.37)
120	120.55 (.31)	120.42 (.42)	120.51	120.04 (.45)	120.71 (.23)	121.55 (.30)	120.76	120.47 (.33)
125	125.84 (.28)	125.76 (.37)	125.82	124.96 (.39)	126.15 (.21)	126.78 (.27)	126.18	125.81 (.32)

(continued)

Table 4 (cont.)

New Form Score	5-5 Tucker	5-5 Levine	5-5 Braun-Holland	5-5 Unsmoothed Equipercentile	5-T Tucker	5-T Levine	5-T Braun-Holland	5-T Unsmoothed Equipercentile
130	131.13 (.27)	131.10 (.35)	131.13	130.85 (.46)	131.58 (.20)	132.01 (.26)	131.60	131.56 (.32)
135	136.42 (.28)	136.44 (.38)	136.43	135.96 (.43)	137.01 (.21)	137.25 (.28)	137.02	136.90 (.31)
140	141.71 (.31)	141.78 (.44)	141.74	141.83 (.46)	142.44 (.23)	142.48 (.32)	142.44	142.45 (.34)
145	147.00 (.35)	147.12 (.52)	147.05	147.47 (.56)	147.88 (.26)	147.71 (.37)	147.87	147.96 (.35)
150	152.29 (.39)	152.46 (.61)	152.35	153.35 (.52)	153.31 (.30)	152.94 (.44)	153.29	153.39 (.44)
155	157.58 (.45)	157.80 (.71)	157.66	158.43 (.62)	158.74 (.34)	158.17 (.52)	158.71	158.97 (.50)
160	162.87 (.51)	163.14 (.82)	162.97	163.72 (.92)	164.18 (.39)	163.41 (.59)	164.13	165.02 (.69)
165	168.16 (.57)	168.48 (.93)	168.27	168.36 (***)	169.61 (.44)	168.64 (.67)	169.55	169.79 (***)
170	173.45 (.64)	173.82 (1.05)	173.58	172.89 (***)	175.04 (.49)	173.87 (.75)	174.97	174.12 (***)
175	178.74 (.70)	179.16 (1.16)	178.89	177.41 (***)	180.47 (.54)	179.10 (.83)	180.39	178.44 (***)
180	184.02 (.77)	184.50 (1.28)	184.19	181.94 (***)	185.91 (.59)	184.33 (.92)	185.81	182.77 (***)
185	189.31 (.84)	189.84 (1.40)	189.50	186.47 (***)	191.34 (.64)	189.57 (1.00)	191.24	187.09 (***)
190	194.60 (.90)	195.18 (1.51)	194.81	190.99 (***)	196.77 (.70)	194.80 (1.08)	196.66	191.42 (***)
195	199.89 (.97)	200.52 (1.63)	200.11	195.52 (***)	202.21 (.75)	200.03 (1.17)	202.08	295.74 (***)
200	205.18 (1.04)	205.86 (1.75)	205.42	200.05 (***)	207.64 (.80)	205.26 (1.25)	207.50	200.07 (***)

*** Standard error not available.

TABLE 5

Selected Raw Score Equivalents and Standard Errors on Link Form 1 for 6-6 and 6-T Equatings

New Form Score	6-6 Tucker	6-6 Levine	6-6 Braun-Holland	6-6 Unsmoothed Equipercentile	6-T Tucker	6-T Levine	6-T Braun-Holland	6-T Unsmoothed Equipercentile
0	-7.69 (.77)	-2.63 (1.17)	-7.13	0.00 (***)	-8.04 (.68)	-5.09 (1.05)	-7.34	-0.01 (***)
5	-2.31 (.74)	2.59 (1.13)	-1.76	4.95 (***)	-2.64 (.65)	0.23 (1.01)	-1.97	4.93 (***)
10	3.08 (.71)	7.81 (1.08)	3.60	9.91 (***)	2.76 (.62)	5.55 (.97)	3.40	9.87 (***)
15	8.47 (.68)	13.03 (1.04)	8.97	14.86 (***)	8.15 (.60)	10.88 (.93)	8.77	14.81 (***)
20	13.85 (.66)	18.25 (.99)	14.33	19.82 (***)	13.55 (.57)	16.20 (.89)	14.14	19.75 (***)
25	19.24 (.63)	23.47 (.95)	19.70	24.77 (***)	18.94 (.55)	21.52 (.85)	19.51	24.69 (***)
30	24.63 (.60)	28.69 (.90)	25.06	29.73 (***)	24.34 (.52)	26.84 (.81)	24.88	29.63 (***)
35	30.01 (.57)	33.92 (.86)	30.43	34.68 (***)	29.74 (.50)	32.16 (.77)	30.25	34.57 (***)
40	35.40 (.54)	39.14 (.82)	35.79	39.64 (***)	35.13 (.47)	37.48 (.73)	35.62	39.51 (***)
45	40.79 (.51)	44.36 (.77)	41.16	44.59 (***)	40.53 (.45)	42.80 (.69)	40.98	44.45 (***)
50	46.17 (.48)	49.58 (.73)	46.52	49.55 (***)	45.93 (.42)	48.12 (.65)	46.35	49.39 (***)
55	51.56 (.45)	54.80 (.68)	51.89	54.50 (***)	51.32 (.40)	53.44 (.61)	51.72	54.33 (***)
60	56.95 (.43)	60.02 (.64)	57.25	59.46 (***)	56.72 (.37)	58.76 (.57)	57.09	59.27 (***)
65	62.33 (.40)	65.24 (.59)	62.62	64.41 (***)	62.12 (.35)	64.09 (.53)	62.46	64.21 (***)
70	67.72 (.37)	70.47 (.55)	67.98	69.37 (***)	67.51 (.32)	69.41 (.49)	67.83	69.14 (***)
75	73.11 (.34)	75.69 (.51)	73.35	74.32 (***)	72.91 (.30)	74.73 (.45)	73.20	74.08 (***)
80	78.50 (.31)	80.91 (.46)	78.71	79.28 (.87)	78.30 (.27)	80.05 (.41)	78.57	79.02 (.84)
85	83.88 (.29)	86.13 (.42)	84.08	84.77 (.72)	83.70 (.25)	85.37 (.37)	83.93	84.46 (.62)
90	89.27 (.26)	91.35 (.38)	89.44	90.77 (.61)	89.10 (.23)	90.69 (.34)	89.30	90.45 (.48)
95	94.66 (.23)	96.57 (.34)	94.81	95.82 (.40)	94.49 (.20)	96.01 (.30)	94.67	95.47 (.35)
100	100.04 (.21)	101.79 (.30)	100.17	100.77 (.33)	99.89 (.18)	101.33 (.26)	100.04	100.35 (.28)
105	105.43 (.18)	107.02 (.26)	105.54	106.03 (.26)	105.29 (.16)	106.65 (.23)	105.41	105.77 (.24)
110	110.82 (.16)	112.24 (.22)	110.90	111.03 (.22)	110.68 (.14)	111.97 (.19)	110.78	110.79 (.20)
115	116.20 (.14)	117.46 (.19)	116.27	116.22 (.20)	116.08 (.12)	117.30 (.16)	116.15	115.97 (.18)
120	121.59 (.12)	122.68 (.16)	121.63	121.09 (.17)	121.48 (.11)	122.62 (.14)	121.52	120.98 (.16)
125	126.98 (.11)	127.90 (.14)	127.00	126.30 (.18)	126.87 (.10)	127.94 (.12)	126.88	126.31 (.15)

(continued)

Table 5 (cont.)

New Form Score	6-6 Tucker	6-6 Levine	6-6 Braun-Holland	6-6 Unsmoothed Equipercentile	6-T Tucker	6-T Levine	6-T Braun-Holland	6-T Unsmoothed Equipercentile
130	132.36 (.11)	133.12 (.14)	132.36	132.14 (.17)	132.27 (.10)	133.26 (.12)	132.25	132.23 (.15)
135	137.75 (.11)	138.34 (.15)	137.73	137.52 (.18)	137.67 (.10)	138.58 (.13)	137.62	137.60 (.15)
140	143.14 (.12)	143.57 (.17)	143.09	143.15 (.20)	143.06 (.11)	143.90 (.15)	142.99	143.04 (.16)
145	148.52 (.14)	148.79 (.20)	148.46	148.89 (.19)	148.46 (.12)	149.22 (.18)	148.36	148.74 (.17)
150	153.91 (.16)	154.01 (.23)	153.82	154.33 (.24)	153.85 (.14)	154.54 (.21)	153.73	154.09 (.21)
155	159.30 (.18)	159.23 (.27)	159.19	159.87 (.25)	159.25 (.16)	159.86 (.24)	159.10	159.46 (.23)
160	164.68 (.21)	164.45 (.31)	164.55	164.79 (.34)	164.65 (.18)	165.18 (.28)	164.47	146.58 (.30)
165	170.07 (.23)	169.67 (.35)	169.92	169.65 (.39)	170.04 (.20)	170.51 (.32)	169.84	169.45 (.43)
170	175.46 (.26)	174.89 (.40)	175.28	174.00 (***)	175.44 (.23)	175.83 (.35)	175.20	173.82 (***)
175	180.84 (.29)	180.12 (.44)	180.65	178.34 (***)	180.84 (.25)	181.15 (.39)	180.57	178.19 (***)
180	186.23 (.32)	185.34 (.48)	186.01	182.69 (***)	186.23 (.27)	186.47 (.43)	185.94	182.57 (***)
185	191.62 (.34)	190.56 (.52)	191.38	187.03 (***)	191.63 (.30)	191.79 (.47)	191.31	186.94 (***)
190	197.01 (.37)	195.78 (.57)	196.74	191.38 (***)	197.03 (.32)	197.11 (.51)	196.68	191.32 (***)
195	202.39 (.40)	201.00 (.61)	202.11	195.72 (***)	202.42 (.35)	202.43 (.55)	202.05	195.69 (***)
200	207.78 (.43)	206.22 (.66)	207.47	200.07 (***)	207.82 (.37)	207.75 (.59)	207.42	200.06 (***)

*** Standard error not available

TABLE 6

Selected Raw Score Equivalents and Standard Errors on Link Form 1 for 9-9 and 9-T Equatings

New Form Score	9-9				9-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
0	-7.15 (.67)	-2.78 (1.04)	-6.65	-0.01 (***)	-7.88 (.62)	-4.25 (.97)	-7.16	-0.01 (***)
5	-1.80 (.65)	2.43 (1.00)	-1.32	4.94 (***)	-2.48 (.60)	1.04 (.93)	-1.80	4.93 (***)
10	3.56 (.62)	7.65 (.96)	4.02	9.89 (***)	2.91 (.57)	6.33 (.89)	3.57	9.86 (***)
15	8.91 (.60)	12.86 (.92)	9.36	14.84 (***)	8.30 (.55)	11.62 (.85)	8.93	14.79 (***)
20	14.27 (.57)	18.07 (.88)	14.69	19.79 (***)	13.70 (.53)	16.91 (.82)	14.30	19.72 (***)
25	19.62 (.54)	23.29 (.84)	20.03	24.73 (***)	19.09 (.50)	22.20 (.78)	19.67	24.66 (***)
30	24.97 (.52)	28.50 (.80)	25.36	29.68 (***)	24.49 (.48)	27.49 (.74)	25.03	29.59 (***)
35	30.33 (.49)	33.72 (.76)	30.70	34.63 (***)	29.88 (.46)	32.78 (.71)	30.40	34.52 (***)
40	35.68 (.40)	38.93 (.72)	36.03	39.58 (***)	35.28 (.43)	38.07 (.67)	35.77	39.46 (***)
45	41.04 (.44)	44.14 (.68)	41.37	44.53 (***)	40.67 (.41)	43.36 (.63)	41.13	44.39 (***)
50	46.39 (.42)	49.36 (.64)	46.70	49.47 (***)	46.06 (.39)	48.65 (.60)	46.50	49.32 (***)
55	51.75 (.39)	54.57 (.60)	52.04	54.42 (***)	51.46 (.36)	53.94 (.56)	51.87	54.26 (***)
60	57.10 (.37)	59.79 (.57)	57.37	59.37 (***)	56.85 (.34)	59.23 (.52)	57.23	59.19 (***)
65	62.46 (.34)	65.00 (.53)	62.71	64.32 (***)	62.25 (.32)	64.53 (.49)	62.60	64.12 (***)
70	67.81 (.32)	70.21 (.49)	68.05	69.27 (***)	67.64 (.30)	69.82 (.45)	67.97	69.05 (***)
75	73.17 (.30)	75.43 (.45)	73.38	74.21 (***)	73.04 (.27)	75.11 (.42)	73.33	73.99 (***)
80	78.52 (.27)	80.64 (.41)	78.72	79.16 (***)	78.43 (.25)	80.40 (.38)	78.70	78.92 (***)
85	83.88 (.25)	85.86 (.37)	84.05	84.56 (.64)	83.82 (.23)	85.69 (.34)	84.06	84.24 (.56)
90	89.23 (.22)	91.07 (.33)	89.39	90.72 (.51)	89.22 (.21)	90.98 (.31)	89.43	90.41 (.44)
95	94.59 (.20)	96.28 (.30)	94.72	95.75 (.35)	94.61 (.19)	96.27 (.27)	94.80	95.43 (.32)
100	99.94 (.18)	101.50 (.26)	100.06	100.67 (.28)	100.01 (.17)	101.56 (.24)	100.16	100.40 (.26)
105	105.30 (.16)	106.71 (.23)	105.39	105.92 (.23)	105.40 (.15)	106.85 (.21)	105.53	105.83 (.22)
110	110.65 (.14)	111.93 (.19)	110.73	110.83 (.20)	110.79 (.13)	112.14 (.18)	110.90	110.88 (.18)
115	116.01 (.12)	117.14 (.16)	116.06	115.95 (.18)	116.19 (.11)	117.43 (.15)	116.26	116.07 (.16)
120	121.36 (.11)	122.36 (.14)	121.40	120.82 (.15)	121.58 (.10)	122.72 (.13)	121.63	121.13 (.14)
125	126.72 (.10)	127.57 (.12)	126.74	126.06 (.16)	126.98 (.09)	128.01 (.12)	127.00	126.52 (.14)

(continued)

Table 6 (cont.)

New Form Score	9-9 Tucker	9-9 Levine	9-9 Braun-Holland	9-9 Unsmoothed Equipercentile	9-T Tucker	9-T Levine	9-T Braun-Holland	9-T Unsmoothed Equipercentile
130	132.07 (.10)	132.78 (.12)	132.07	131.89 (.15)	132.37 (.09)	133.30 (.11)	132.36	132.42 (.14)
135	137.43 (.10)	138.00 (.13)	137.41	137.23 (.16)	137.77 (.09)	138.59 (.12)	137.73	137.72 (.14)
140	142.78 (.11)	143.21 (.15)	142.74	142.79 (.16)	143.16 (.10)	143.89 (.14)	143.09	143.15 (.16)
145	148.14 (.12)	148.43 (.18)	148.08	148.55 (.18)	148.55 (.11)	149.18 (.17)	148.46	148.82 (.16)
150	153.49 (.14)	153.64 (.21)	153.41	153.93 (.22)	153.95 (.13)	154.47 (.19)	153.83	154.10 (.20)
155	158.85 (.16)	158.85 (.24)	158.75	159.29 (.24)	159.34 (.15)	159.76 (.23)	159.19	159.35 (.22)
160	164.20 (.18)	164.07 (.28)	164.08	164.39 (.32)	164.74 (.17)	165.05 (.26)	164.56	164.56 (.28)
165	169.56 (.21)	169.28 (.31)	169.42	169.51 (.40)	170.13 (.19)	170.34 (.29)	169.93	169.49 (.40)
170	174.91 (.23)	174.50 (.35)	174.76	173.88 (***)	175.53 (.21)	175.63 (.33)	175.29	173.86 (***)
175	180.27 (.25)	179.71 (.39)	180.09	178.24 (***)	180.92 (.23)	180.92 (.36)	180.66	178.23 (***)
180	185.62 (.28)	184.92 (.43)	185.43	182.61 (***)	186.31 (.25)	186.21 (.40)	186.03	182.59 (***)
185	190.98 (.30)	190.14 (.47)	190.76	186.97 (***)	191.71 (.28)	191.50 (.44)	191.39	186.96 (***)
190	196.33 (.32)	195.35 (.51)	196.10	191.34 (***)	197.10 (.30)	196.79 (.47)	196.76	191.33 (***)
195	201.69 (.35)	200.57 (.54)	201.43	195.70 (***)	202.50 (.32)	202.08 (.51)	202.13	195.70 (***)
200	207.04 (.37)	205.78 (.58)	206.77	200.06 (***)	207.89 (.34)	207.37 (.54)	207.49	200.06 (***)

*** Standard error not available

TABLE 7

Selected Raw Score Equivalents and Standard Errors on Link Form 1 for L-L and L-T Equatings

New Form Score	L-L				L-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
0	-6.52 (.66)	-5.70 (1.05)	-6.10	0.00 (***)	-7.28 (.61)	-5.35 (.96)	-6.74	0.00 (***)
5	-1.18 (.63)	-0.35 (1.01)	-0.77	4.97 (***)	-1.91 (.59)	-0.02 (.93)	-1.39	4.95 (***)
10	4.17 (.61)	4.99 (.97)	4.56	9.95 (***)	3.46 (.56)	5.31 (.89)	3.96	9.91 (***)
15	9.52 (.58)	10.34 (.93)	9.89	14.92 (***)	8.84 (.54)	10.63 (.85)	9.31	14.86 (***)
20	14.86 (.56)	15.68 (.89)	15.22	19.89 (***)	14.21 (.52)	15.96 (.82)	14.67	19.82 (***)
25	20.21 (.53)	21.03 (.85)	20.55	24.87 (***)	19.58 (.49)	21.29 (.78)	20.02	24.77 (***)
30	25.56 (.51)	26.37 (.81)	25.88	29.84 (***)	24.96 (.47)	26.62 (.74)	25.37	29.73 (***)
35	30.90 (.48)	31.72 (.77)	31.21	34.82 (***)	30.33 (.45)	31.94 (.70)	30.72	34.68 (***)
40	36.25 (.46)	37.06 (.73)	36.54	39.79 (***)	35.70 (.43)	37.27 (.67)	36.07	39.64 (***)
45	41.60 (.44)	42.41 (.69)	41.87	44.76 (***)	41.08 (.40)	42.60 (.63)	41.43	44.60 (***)
50	46.94 (.41)	47.75 (.65)	47.20	49.74 (***)	46.45 (.38)	47.92 (.59)	46.78	49.55 (***)
55	52.29 (.39)	53.10 (.61)	52.53	54.71 (***)	51.82 (.36)	53.25 (.56)	52.13	54.51 (***)
60	57.64 (.36)	58.44 (.57)	57.86	59.69 (***)	57.20 (.34)	58.58 (.52)	57.48	59.46 (***)
65	62.98 (.34)	63.79 (.53)	63.19	64.66 (***)	62.57 (.31)	63.91 (.49)	62.83	64.42 (***)
70	68.33 (.31)	69.13 (.49)	68.52	69.63 (***)	67.94 (.29)	69.23 (.45)	68.19	69.37 (***)
75	73.68 (.29)	74.48 (.45)	73.85	74.61 (***)	73.32 (.27)	74.56 (.41)	73.54	74.33 (***)
80	79.03 (.27)	79.82 (.41)	79.18	79.65 (.88)	78.69 (.25)	79.89 (.38)	78.89	79.24 (.75)
85	84.37 (.24)	85.17 (.37)	84.51	85.01 (.63)	84.06 (.23)	85.22 (.34)	84.24	84.49 (.55)
90	89.72 (.22)	90.51 (.34)	89.84	91.26 (.41)	89.44 (.20)	90.54 (.31)	89.59	90.75 (.43)
95	95.07 (.20)	95.86 (.30)	95.17	95.78 (.34)	94.81 (.18)	95.87 (.27)	94.95	95.41 (.31)
100	100.41 (.18)	101.20 (.26)	100.50	100.80 (.28)	100.18 (.16)	101.20 (.24)	100.30	100.59 (.25)
105	105.76 (.15)	106.55 (.23)	105.83	106.26 (.22)	105.56 (.14)	106.53 (.21)	105.65	106.03 (.21)
110	111.11 (.14)	111.89 (.19)	111.16	111.19 (.18)	110.93 (.13)	111.85 (.18)	111.00	111.00 (.18)
115	116.45 (.12)	117.24 (.16)	116.49	116.32 (.17)	116.30 (.11)	117.18 (.15)	116.35	116.20 (.16)
120	121.80 (.11)	122.58 (.14)	121.82	121.35 (.15)	121.67 (.10)	122.51 (.13)	121.71	121.28 (.14)
125	127.15 (.10)	127.93 (.12)	127.15	126.64 (.15)	127.05 (.09)	127.83 (.11)	127.06	126.56 (.14)

(continued)

Table 7 (cont.)

New Form Score	L-L				L-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
130	132.49 (.09)	133.27 (.12)	132.48	132.29 (.15)	132.42 (.09)	133.16 (.11)	132.41	132.27 (.14)
135	137.84 (.10)	138.62 (.13)	137.81	137.64 (.15)	137.79 (.09)	138.49 (.12)	137.76	137.65 (.14)
140	143.19 (.11)	143.96 (.15)	143.14	143.05 (.17)	143.17 (.10)	143.82 (.14)	143.11	143.11 (.16)
145	148.53 (.12)	149.31 (.18)	148.47	148.84 (.17)	148.54 (.11)	149.14 (.17)	148.47	148.85 (.16)
150	153.88 (.14)	154.65 (.21)	153.80	154.16 (.23)	153.91 (.13)	154.47 (.20)	153.82	154.18 (.20)
155	159.23 (.16)	160.00 (.25)	159.13	159.71 (.23)	159.29 (.15)	159.80 (.23)	159.17	159.54 (.22)
160	164.57 (.18)	165.34 (.29)	164.46	164.92 (.29)	164.66 (.17)	165.13 (.26)	164.52	164.72 (.28)
165	169.92 (.20)	170.69 (.32)	169.79	170.00 (.40)	170.03 (.19)	170.45 (.29)	169.87	169.89 (.37)
170	175.27 (.23)	176.03 (.36)	175.12	174.29 (***)	175.41 (.21)	175.78 (.33)	175.23	174.20 (***)
175	180.61 (.25)	181.38 (.40)	180.45	178.59 (***)	180.78 (.23)	181.11 (.36)	180.58	178.51 (***)
180	185.96 (.27)	186.72 (.44)	185.78	182.89 (***)	186.15 (.25)	186.43 (.40)	185.93	182.82 (***)
185	191.31 (.30)	192.06 (.48)	191.11	187.18 (***)	191.53 (.27)	191.76 (.44)	191.28	187.14 (***)
190	196.66 (.32)	197.41 (.52)	196.44	191.48 (***)	196.90 (.30)	197.09 (.47)	196.63	191.45 (***)
195	202.00 (.34)	202.75 (.56)	201.77	195.77 (***)	202.27 (.32)	202.42 (.51)	201.98	195.76 (***)
200	207.35 (.37)	208.10 (.60)	207.10	200.07 (***)	207.65 (.34)	207.74 (.54)	207.34	200.07 (***)

*** Standard error not available

TABLE 8

Selected Raw Score Equivalents and Standard Errors on Link Form 1 for 7-7 and 7-T Equatings

New Form Score	7-7 Tucker	7-7 Levine	7-7 Braun-Holland	7-7 Unsmoothed Equipercentile	7-T Tucker	7-T Levine	7-T Braun-Holland	7-T Unsmoothed Equipercentile
0	-7.10 (1.29)	-4.50 (2.04)	-6.58	0.00 (***)	-4.79 (1.03)	-3.65 (1.63)	-4.58	0.01 (***)
5	-1.74 (1.25)	0.78 (1.96)	-1.24	5.05 (***)	0.51 (.99)	1.62 (1.57)	0.72	5.07 (***)
10	3.62 (1.19)	6.06 (1.88)	4.10	10.10 (***)	5.82 (.95)	6.89 (1.50)	6.01	10.14 (***)
15	8.98 (1.15)	11.34 (1.80)	9.43	15.14 (***)	11.12 (.91)	12.16 (1.44)	11.30	15.21 (***)
20	14.34 (1.10)	16.62 (1.72)	14.77	20.19 (***)	16.42 (.88)	17.43 (1.38)	16.60	20.38 (***)
25	19.70 (1.05)	21.90 (1.64)	20.11	25.23 (***)	21.72 (.84)	22.69 (1.32)	21.89	25.35 (***)
30	25.06 (1.00)	27.18 (1.57)	25.45	30.28 (***)	27.02 (.80)	27.96 (1.25)	27.18	30.42 (***)
35	30.42 (.95)	32.46 (1.49)	30.79	35.33 (***)	32.32 (.76)	33.23 (1.19)	32.48	35.48 (***)
40	35.77 (.90)	37.74 (1.41)	36.13	40.37 (***)	37.62 (.72)	38.50 (1.13)	37.77	40.55 (***)
45	41.13 (.85)	43.02 (1.33)	41.47	45.42 (***)	42.93 (.68)	43.77 (1.07)	43.06	45.62 (***)
50	46.49 (.80)	48.30 (1.25)	46.80	50.46 (***)	48.23 (.64)	49.04 (1.00)	48.36	50.69 (***)
55	51.85 (.75)	53.58 (1.17)	52.14	55.51 (***)	53.53 (.60)	54.31 (.94)	53.65	55.76 (***)
60	57.21 (.71)	58.86 (1.10)	57.48	60.56 (***)	58.83 (.56)	59.58 (.88)	58.94	60.82 (***)
65	62.57 (.66)	64.14 (1.02)	62.82	65.60 (***)	64.13 (.53)	64.84 (.82)	64.24	65.89 (***)
70	67.93 (.61)	69.42 (.94)	68.16	70.65 (***)	69.43 (.49)	70.11 (.76)	69.53	70.96 (***)
75	73.29 (.56)	74.70 (.87)	73.50	75.69 (***)	74.73 (.45)	75.38 (.70)	74.82	76.03 (***)
80	78.64 (.52)	79.98 (.79)	78.84	81.04 (1.43)	80.04 (.41)	80.65 (.63)	80.12	81.13 (1.25)
85	84.00 (.47)	85.26 (.71)	84.17	83.87 (.86)	85.34 (.38)	85.92 (.57)	85.41	85.00 (.92)
90	89.36 (.43)	90.54 (.64)	89.51	89.81 (.80)	90.64 (.34)	91.19 (.52)	90.70	91.12 (.69)
95	94.72 (.38)	95.82 (.57)	94.85	94.29 (.55)	95.94 (.31)	96.46 (.46)	96.00	96.06 (.53)
100	100.08 (.34)	101.10 (.50)	100.19	99.78 (.52)	101.24 (.27)	101.73 (.40)	101.29	101.23 (.42)
105	105.44 (.30)	106.38 (.43)	105.53	105.55 (.44)	106.54 (.24)	106.99 (.35)	106.58	106.62 (.35)
110	110.80 (.26)	111.66 (.37)	110.87	111.03 (.35)	111.85 (.21)	112.26 (.30)	111.88	112.12 (.30)
115	116.16 (.23)	116.94 (.31)	116.20	116.11 (.34)	117.15 (.18)	117.53 (.25)	117.17	117.27 (.27)
120	121.52 (.21)	122.22 (.27)	121.54	121.33 (.32)	122.45 (.16)	122.80 (.22)	122.46	122.23 (.25)
125	126.87 (.20)	127.50 (.25)	126.88	126.52 (.31)	127.75 (.15)	128.07 (.20)	127.76	127.38 (.24)

(continued)

Table 8 (cont.)

New Form Score	7-7 Tucker	7-7 Levine	7-7 Braun-Holland	7-7 Unsmoothed Equipercentile	7-T Tucker	7-T Levine	7-T Braun-Holland	7-T Unsmoothed Equipercentile
130	132.23 (.19)	132.78 (.25)	132.22	132.25 (.32)	133.05 (.15)	133.34 (.19)	133.05	132.92 (.24)
135	137.59 (.21)	138.06 (.27)	137.56	137.74 (.29)	138.35 (.16)	138.61 (.21)	138.34	138.15 (.24)
140	142.95 (.23)	143.34 (.32)	142.90	142.77 (.33)	143.65 (.18)	143.88 (.25)	143.64	143.52 (.27)
145	148.31 (.26)	148.62 (.37)	148.24	148.63 (.34)	148.96 (.20)	149.14 (.29)	148.93	149.30 (.29)
150	153.67 (.29)	153.90 (.44)	153.57	154.01 (.44)	154.26 (.23)	154.41 (.34)	154.22	154.58 (.34)
155	159.03 (.33)	159.18 (.51)	158.91	158.65 (.46)	159.56 (.26)	159.68 (.40)	159.52	159.74 (.38)
160	164.39 (.38)	164.46 (.58)	164.25	164.13 (.68)	164.86 (.29)	164.95 (.45)	164.81	165.26 (.52)
165	169.75 (.42)	169.74 (.65)	169.59	168.92 (***)	170.16 (.33)	170.22 (.51)	170.10	169.98 (***)
170	175.10 (.46)	175.02 (.72)	174.93	173.37 (***)	175.46 (.36)	175.49 (.57)	175.40	174.28 (***)
175	180.46 (.51)	180.31 (.80)	180.27	177.82 (***)	180.76 (.40)	180.76 (.63)	180.69	178.58 (***)
180	185.82 (.56)	185.59 (.87)	185.61	182.27 (***)	186.07 (.44)	186.03 (.69)	185.98	182.88 (***)
185	191.18 (.60)	190.87 (.95)	190.94	186.71 (***)	191.37 (.47)	191.29 (.75)	191.28	187.17 (***)
190	196.54 (.65)	196.15 (1.03)	196.28	191.16 (***)	196.67 (.51)	196.56 (.81)	196.57	191.47 (***)
195	201.90 (.70)	201.43 (1.11)	201.62	195.61 (***)	201.97 (.55)	201.83 (.87)	201.86	195.77 (***)
200	207.26 (.75)	206.71 (1.18)	206.96	200.06 (***)	207.27 (.59)	207.10 (.94)	207.16	200.07 (***)

*** Standard error not available

TABLE 9

Selected Raw Score Equivalents and Standard Errors on Link Form 1 for S-S and S-T Equatings

New Form Score	S-S				S-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
0	-9.67 (1.55)	1.50 (2.22)	-9.27	-0.04 (***)	-6.72 (1.15)	-4.93 (1.81)	-6.94	-.02 (***)
5	-4.25 (1.49)	6.51 (2.14)	-3.87	4.59 (***)	-1.32 (1.11)	.40 (1.74)	-1.52	4.82 (***)
10	1.17 (1.43)	11.52 (2.05)	1.54	9.22 (***)	4.09 (1.06)	5.72 (1.67)	3.89	9.65 (***)
15	6.59 (1.37)	16.54 (1.96)	6.95	13.85 (***)	9.50 (1.02)	11.05 (1.60)	9.31	14.49 (***)
20	12.01 (1.31)	21.55 (1.87)	12.35	18.48 (***)	14.91 (.97)	16.38 (1.53)	14.73	19.32 (***)
25	17.43 (1.25)	26.56 (1.79)	17.76	23.11 (***)	20.31 (.93)	21.71 (1.46)	20.14	24.16 (***)
30	22.85 (1.19)	31.57 (1.70)	23.16	27.74 (***)	25.72 (.89)	27.04 (1.39)	25.56	28.99 (***)
35	28.27 (1.13)	36.58 (1.61)	28.57	32.37 (***)	31.13 (.84)	32.37 (1.32)	30.98	33.82 (***)
40	33.69 (1.07)	41.60 (1.53)	33.97	37.00 (***)	36.54 (.80)	37.69 (1.25)	36.40	38.66 (***)
45	39.11 (1.01)	46.61 (1.44)	39.38	41.63 (***)	41.95 (.75)	43.02 (1.18)	41.81	43.49 (***)
50	44.53 (.95)	51.62 (1.35)	44.79	46.26 (***)	47.35 (.71)	48.35 (1.11)	47.23	48.33 (***)
55	49.95 (.89)	56.63 (1.27)	50.19	50.89 (***)	52.76 (.66)	53.68 (1.04)	52.65	53.16 (***)
60	55.37 (.83)	61.65 (1.18)	55.60	55.52 (***)	58.17 (.62)	59.01 (.97)	58.06	58.00 (***)
65	60.79 (.77)	66.66 (1.10)	61.00	60.15 (***)	63.58 (.58)	64.34 (.90)	63.48	62.83 (***)
70	66.21 (.72)	71.67 (1.01)	66.41	64.78 (***)	68.98 (.53)	69.66 (.83)	68.90	67.66 (***)
75	71.63 (.66)	76.68 (.93)	71.82	69.41 (***)	74.39 (.49)	74.99 (.76)	74.31	72.50 (***)
80	77.05 (.60)	81.70 (.84)	77.22	74.86 (2.45)	79.80 (.45)	80.32 (.69)	79.73	77.57 (1.32)
85	82.48 (.55)	86.71 (.76)	82.63	81.81 (1.28)	85.21 (.41)	85.65 (.62)	85.15	83.82 (1.09)
90	87.90 (.49)	91.72 (.68)	88.03	87.34 (1.12)	90.62 (.37)	90.98 (.56)	90.56	90.77 (.83)
95	93.32 (.44)	96.73 (.60)	93.44	95.33 (.70)	96.02 (.33)	96.31 (.49)	95.98	97.32 (.50)
100	98.74 (.39)	101.74 (.52)	98.85	100.13 (.55)	101.43 (.29)	101.63 (.43)	101.40	102.02 (.44)
105	104.16 (.34)	106.76 (.45)	104.25	104.78 (.50)	106.84 (.25)	106.96 (.37)	106.82	106.92 (.37)
110	109.58 (.30)	111.77 (.39)	109.66	109.52 (.39)	112.25 (.22)	112.29 (.32)	112.23	111.92 (.33)
115	115.00 (.26)	116.78 (.33)	115.06	115.16 (.37)	117.65 (.20)	117.62 (.27)	117.65	117.47 (.29)
120	120.42 (.24)	121.79 (.29)	120.47	120.17 (.34)	123.06 (.18)	122.95 (.23)	123.07	122.88 (.28)
125	125.84 (.23)	126.81 (.28)	125.87	125.08 (.37)	128.47 (.17)	128.28 (.21)	128.48	128.29 (.28)

(continued)

Table 9 (cont.)

New Form Score	S-S				S-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
130	131.26 (.24)	131.82 (.29)	131.28	131.12 (.37)	133.88 (.17)	133.60 (.22)	133.90	134.23 (.27)
135	136.68 (.26)	136.83 (.33)	136.69	136.64 (.41)	139.29 (.19)	138.93 (.25)	139.32	139.45 (.28)
140	142.10 (.29)	141.84 (.38)	142.09	142.15 (.40)	144.69 (.21)	144.26 (.29)	144.73	144.78 (.32)
145	147.52 (.33)	146.86 (.45)	147.50	147.75 (.50)	150.10 (.24)	149.59 (.34)	150.15	150.18 (.34)
150	152.94 (.38)	151.87 (.52)	152.90	153.40 (.60)	155.51 (.28)	154.92 (.40)	155.57	155.62 (.40)
155	158.36 (.43)	156.88 (.59)	158.31	159.40 (.68)	160.92 (.31)	160.25 (.46)	160.98	161.06 (.51)
160	163.78 (.48)	161.89 (.67)	163.72	163.45 (.87)	166.32 (.35)	165.57 (.53)	166.40	165.65 (.64)
165	169.20 (.54)	166.90 (.75)	169.12	168.93 (***)	171.73 (.39)	170.90 (.59)	171.82	170.21 (***)
170	174.62 (.59)	171.92 (.84)	174.53	173.38 (***)	177.14 (.43)	176.23 (.66)	177.24	174.47 (***)
175	180.04 (.65)	176.93 (.92)	179.93	177.82 (***)	182.55 (.48)	181.56 (.73)	182.65	178.74 (***)
180	185.46 (.71)	181.94 (1.01)	185.34	182.27 (***)	187.95 (.52)	186.89 (.79)	188.07	183.01 (***)
185	190.88 (.77)	186.95 (1.09)	190.74	186.72 (***)	193.36 (.56)	192.21 (.86)	193.49	187.27 (***)
190	196.30 (.82)	191.97 (1.18)	196.15	191.16 (***)	198.77 (.61)	197.54 (.93)	198.90	191.54 (***)
195	201.72 (.88)	196.98 (1.26)	201.56	195.61 (***)	204.18 (.65)	202.87 (1.00)	204.32	195.81 (***)
200	207.14 (.94)	201.99 (1.35)	206.96	200.06 (***)	209.59 (.69)	208.20 (1.07)	209.74	200.07 (***)

*** Standard error not available.

TABLE 10

Selected Raw Score Equivalents and Standard Errors on Link Form 1 for C-C and C-T Equatings

New Form Score	C-C				C-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
0	-4.16 (.91)	-5.96 (1.48)	-3.87	-0.01 (***)	-4.07 (.74)	-3.45 (1.20)	-3.80	0.00 (***)
5	1.09 (.87)	- .63 (1.43)	1.36	4.94 (***)	1.14 (.72)	1.75 (1.15)	1.40	4.95 (***)
10	6.33 (.84)	4.70 (1.37)	6.59	9.88 (***)	6.35 (.69)	6.94 (1.11)	6.60	9.90 (***)
15	11.58 (.80)	10.03 (1.31)	11.82	14.82 (***)	11.56 (.66)	12.14 (1.06)	11.79	14.85 (***)
20	16.82 (.77)	15.36 (1.26)	17.06	19.76 (***)	16.76 (.63)	17.34 (1.02)	16.99	19.81 (***)
25	22.07 (.74)	20.69 (1.20)	22.29	24.70 (***)	21.97 (.60)	22.54 (.97)	22.19	24.76 (***)
30	27.31 (.70)	26.02 (1.14)	27.52	29.64 (***)	27.18 (.58)	27.73 (.92)	27.39	29.71 (***)
35	32.56 (.67)	31.35 (1.09)	32.76	34.58 (***)	32.39 (.55)	32.93 (.88)	32.59	34.66 (***)
40	37.80 (.64)	36.68 (1.03)	37.99	39.52 (***)	37.60 (.52)	38.13 (.83)	37.79	39.62 (***)
45	43.05 (.60)	42.00 (.97)	43.22	44.47 (***)	42.81 (.49)	43.33 (.79)	42.98	44.57 (***)
50	48.29 (.57)	47.33 (.92)	48.45	49.41 (***)	48.02 (.47)	48.52 (.74)	48.18	49.52 (***)
55	53.54 (.54)	52.66 (.86)	53.69	54.35 (***)	53.23 (.44)	53.72 (.70)	53.38	54.47 (***)
60	58.78 (.50)	57.99 (.81)	58.92	59.29 (***)	58.44 (.41)	58.92 (.65)	58.58	59.43 (***)
65	64.02 (.47)	63.32 (.75)	64.15	64.23 (***)	63.64 (.39)	64.11 (.61)	63.78	64.38 (***)
70	69.27 (.44)	68.65 (.70)	69.39	69.17 (***)	68.85 (.36)	69.31 (.56)	68.98	69.33 (***)
75	74.51 (.40)	73.98 (.64)	74.62	74.11 (***)	74.06 (.33)	74.51 (.52)	74.17	74.28 (***)
80	79.76 (.37)	79.31 (.59)	79.85	79.05 (1.06)	79.27 (.31)	79.71 (.47)	79.37	79.21 (.92)
85	85.00 (.34)	84.64 (.53)	85.08	84.95 (.91)	84.48 (.28)	84.90 (.43)	84.57	84.67 (.69)
90	90.25 (.31)	89.97 (.48)	90.32	90.78 (.58)	89.69 (.25)	90.10 (.39)	89.77	90.84 (.54)
95	95.49 (.28)	95.30 (.43)	95.55	95.34 (.51)	94.90 (.23)	95.30 (.35)	94.97	95.34 (.39)
100	100.74 (.25)	100.63 (.37)	100.78	100.63 (.41)	100.11 (.20)	100.49 (.30)	100.17	100.49 (.32)
105	105.98 (.22)	105.96 (.32)	106.02	106.25 (.33)	105.32 (.18)	105.69 (.26)	105.36	106.01 (.26)
110	111.23 (.19)	111.29 (.28)	111.25	111.11 (.27)	110.52 (.16)	110.89 (.23)	100.56	110.69 (.22)
115	116.47 (.17)	116.62 (.24)	116.48	116.38 (.25)	115.73 (.14)	116.09 (.19)	115.76	115.80 (.20)
120	121.72 (.15)	121.95 (.20)	121.72	121.69 (.23)	120.94 (.13)	121.28 (.16)	120.96	120.78 (.18)
125	126.96 (.14)	127.28 (.18)	126.95	126.91 (.22)	126.15 (.11)	126.48 (.15)	126.16	125.78 (.18)

(continued)

Table 10 (cont.)

New Form Score	C-C				C-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
130	132.21 (.13)	132.61 (.17)	132.18	132.37 (.21)	131.36 (.11)	131.68 (.14)	131.36	130.98 (.18)
135	137.45 (.14)	137.94 (.19)	137.41	137.46 (.19)	136.57 (.11)	136.87 (.15)	136.55	136.34 (.17)
140	142.70 (.15)	142.65 (.21)	142.65	142.45 (.21)	141.78 (.12)	142.07 (.17)	141.75	141.48 (.18)
145	147.94 (.17)	148.60 (.25)	147.88	147.89 (.23)	146.99 (.14)	147.27 (.20)	146.95	146.98 (.20)
150	153.18 (.19)	153.93 (.29)	153.11	153.00 (.26)	152.20 (.16)	152.47 (.24)	152.15	152.44 (.23)
155	158.43 (.22)	159.26 (.34)	158.35	158.08 (.29)	157.41 (.18)	157.66 (.28)	157.35	158.03 (.26)
160	163.67 (.24)	164.59 (.39)	163.58	163.60 (.45)	162.61 (.20)	162.86 (.32)	162.55	163.17 (.36)
165	168.92 (.27)	169.92 (.44)	168.81	169.19 (.75)	167.82 (.22)	168.06 (.36)	167.74	169.15 (.55)
170	174.16 (.30)	175.25 (.50)	174.04	173.60 (***)	173.03 (.25)	173.25 (.40)	172.94	173.57 (***)
175	179.41 (.34)	180.58 (.55)	179.28	178.01 (***)	178.24 (.28)	178.45 (.44)	178.14	177.98 (***)
180	184.65 (.37)	185.91 (.61)	184.51	182.42 (***)	183.45 (.30)	183.65 (.49)	183.34	182.40 (***)
185	189.90 (.40)	191.24 (.66)	189.74	186.83 (***)	188.66 (.33)	188.85 (.53)	188.54	186.81 (***)
190	195.14 (.43)	196.57 (.72)	194.98	191.24 (***)	193.87 (.35)	194.04 (.58)	193.74	191.23 (***)
195	200.39 (.46)	201.90 (.77)	200.21	195.65 (***)	199.08 (.38)	199.24 (.62)	198.93	195.64 (***)
200	205.63 (.50)	207.23 (.83)	205.44	200.06 (***)	204.29 (.41)	204.44 (.67)	204.13	200.06 (***)

*** Standard error not available.

TABLE 11

Selected Raw Score Equivalents and Standard Errors on Link Form 2 for 5-5 and 5-T Equatings

New Form Score	5-5 Tucker	5-5 Levine	5-5 Braun-Holland	5-5 Unsmoothed Equipercentile	5-T Tucker	5-T Levine	5-T Braun-Holland	5-T Unsmoothed Equipercentile
0	-7.31 (2.76)	-0.23 (4.27)	-6.04	-0.02 (***)	-6.38 (1.51)	3.73 (2.14)	-4.52	-0.01 (***)
5	-1.98 (2.66)	4.94 (4.10)	-0.76	4.81 (***)	-1.13 (1.46)	8.69 (2.05)	0.66	4.93 (***)
10	3.35 (2.55)	10.10 (3.93)	4.52	9.64 (***)	4.11 (1.40)	13.65 (1.97)	5.83	9.87 (***)
15	8.68 (2.44)	15.27 (3.77)	9.80	14.47 (***)	9.36 (1.34)	18.61 (1.89)	11.00	14.80 (***)
20	14.01 (2.33)	20.44 (3.60)	15.08	19.30 (***)	14.61 (1.29)	23.57 (1.81)	16.18	19.74 (***)
25	19.34 (2.23)	25.60 (3.43)	20.36	24.13 (***)	19.85 (1.23)	28.53 (1.72)	21.35	24.67 (***)
30	24.67 (2.12)	30.77 (3.26)	25.63	28.96 (***)	25.10 (1.17)	33.49 (1.64)	26.53	29.61 (***)
35	30.01 (2.01)	35.94 (3.09)	30.91	33.79 (***)	30.35 (1.12)	38.45 (1.56)	31.70	34.55 (***)
40	35.34 (1.91)	41.10 (2.93)	36.19	38.62 (***)	35.59 (1.06)	43.40 (1.48)	36.87	39.48 (***)
45	40.67 (1.80)	46.27 (2.76)	41.47	43.45 (***)	40.84 (1.00)	48.36 (1.40)	42.05	44.42 (***)
50	46.00 (1.70)	51.44 (2.59)	46.75	48.28 (***)	46.09 (.95)	53.32 (1.31)	47.22	49.35 (***)
55	51.33 (1.59)	56.60 (2.42)	52.03	53.11 (***)	51.34 (.89)	58.28 (1.23)	52.40	54.29 (***)
60	56.66 (1.49)	61.77 (2.26)	57.31	57.94 (***)	56.58 (.84)	63.24 (1.15)	57.57	59.22 (***)
65	61.99 (1.38)	66.93 (2.09)	62.59	62.77 (***)	61.83 (.78)	68.20 (1.07)	62.74	64.16 (***)
70	67.32 (1.28)	72.10 (1.93)	67.87	67.60 (***)	67.08 (.72)	73.16 (.99)	67.92	69.10 (***)
75	72.65 (1.18)	77.27 (1.77)	73.15	72.43 (***)	72.32 (.67)	78.12 (.91)	73.09	74.03 (***)
80	77.98 (1.08)	82.43 (1.60)	78.43	77.26 (***)	77.57 (.61)	83.08 (.83)	78.27	78.97 (***)
85	83.31 (.98)	87.60 (1.44)	83.70	83.73 (2.66)	82.82 (.56)	88.04 (.75)	83.44	83.92 (1.42)
90	88.64 (.88)	92.77 (1.29)	88.98	89.66 (1.98)	88.06 (.51)	93.00 (.67)	88.61	89.04 (1.29)
95	93.97 (.78)	97.93 (1.13)	94.26	94.49 (1.27)	93.31 (.46)	97.96 (.60)	93.79	94.38 (.83)
100	99.30 (.69)	103.10 (.98)	99.54	99.75 (1.01)	98.56 (.41)	102.92 (.52)	98.96	99.11 (.64)
105	104.64 (.61)	108.27 (.84)	104.82	105.09 (.99)	103.80 (.36)	107.88 (.45)	104.13	104.38 (.50)
110	109.97 (.53)	113.43 (.71)	110.10	110.06 (.66)	109.05 (.31)	112.84 (.39)	109.31	109.46 (.44)
115	115.30 (.47)	118.60 (.61)	115.38	115.51 (.61)	114.30 (.27)	117.80 (.33)	114.48	114.40 (.35)
120	120.63 (.42)	123.77 (.54)	120.66	120.17 (.57)	119.54 (.24)	122.76 (.29)	119.66	119.39 (.34)
125	125.96 (.41)	128.93 (.51)	125.94	125.49 (.73)	124.79 (.21)	127.72 (.26)	124.83	124.46 (.32)

(continued)

Table 11 (cont.)

New Form Score	5-5 Tucker	5-5 Levine	5-5 Braun-Holland	5-5 Unsmoothed Equipercentile	5-T Tucker	5-T Levine	5-T Braun-Holland	5-T Unsmoothed Equipercentile
130	131.29 (.41)	134.10 (.54)	131.22	131.43 (.53)	130.04 (.21)	132.68 (.26)	130.00	129.76 (.31)
135	136.62 (.45)	139.27 (.62)	136.49	136.27 (.73)	135.28 (.21)	137.64 (.29)	135.18	134.85 (.31)
140	141.95 (.51)	144.43 (.73)	141.77	141.66 (.75)	140.53 (.23)	142.60 (.33)	140.35	140.23 (.34)
145	147.28 (.58)	149.60 (.86)	147.05	146.75 (.82)	145.78 (.27)	147.56 (.39)	145.53	145.55 (.38)
150	152.61 (.66)	154.76 (1.00)	152.33	153.86 (1.04)	151.02 (.31)	152.52 (.46)	150.70	151.24 (.49)
155	157.94 (.75)	159.93 (1.15)	157.61	157.58 (1.33)	156.27 (.35)	157.48 (.53)	155.87	156.54 (.50)
160	163.27 (.84)	165.10 (1.31)	162.89	163.71 (1.45)	161.52 (.40)	162.44 (.60)	161.05	162.52 (.82)
165	168.60 (.94)	170.26 (1.47)	168.17	167.06 (***)	166.76 (.45)	167.40 (.68)	166.22	168.88 (***)
170	173.93 (1.04)	175.43 (1.63)	173.45	171.77 (***)	172.01 (.50)	172.36 (.75)	171.39	173.33 (***)
175	179.26 (1.14)	180.60 (1.79)	178.73	176.48 (***)	177.26 (.55)	177.32 (.83)	176.57	177.79 (***)
180	184.60 (1.24)	185.76 (1.95)	184.01	181.19 (***)	182.50 (.61)	182.28 (.91)	181.74	182.24 (***)
185	189.93 (1.34)	190.93 (2.12)	189.29	185.90 (***)	187.75 (.66)	187.24 (.99)	186.92	186.69 (***)
190	195.26 (1.45)	196.10 (2.28)	194.56	190.61 (***)	193.00 (.72)	192.20 (1.07)	192.09	191.15 (***)
195	200.59 (1.55)	201.26 (2.45)	199.84	195.32 (***)	198.25 (.77)	197.16 (1.15)	197.26	195.60 (***)
200	205.92 (1.66)	206.43 (2.62)	205.12	200.03 (***)	203.49 (.83)	202.12 (1.23)	202.44	200.05 (***)

*** Standard error not available

TABLE 12

Selected Raw Score Equivalents and Standard Errors on Link Form 2 for 6-6 and 6-T Equatings

New Form Score	6-6				6-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
0	-2.65 (.90)	4.93 (1.38)	-1.57	0.00 (***)	-4.29 (.78)	5.59 (1.17)	-3.14	0.00 (***)
5	2.47 (.86)	9.86 (1.33)	3.52	4.97 (***)	0.88 (.75)	10.49 (1.12)	1.98	4.96 (***)
10	7.60 (.83)	14.79 (1.28)	8.60	9.95 (***)	6.05 (.72)	15.40 (1.08)	7.11	9.92 (***)
15	12.73 (.79)	19.72 (1.22)	13.69	14.93 (***)	11.22 (.69)	20.30 (1.03)	12.23	14.88 (***)
20	17.86 (.76)	24.65 (1.17)	18.77	19.90 (***)	16.39 (.66)	25.20 (.99)	17.35	19.84 (***)
25	22.98 (.72)	29.59 (1.11)	23.85	24.88 (***)	21.56 (.63)	30.11 (.94)	22.48	24.80 (***)
30	28.11 (.69)	34.52 (1.06)	28.94	29.85 (***)	26.72 (.60)	35.01 (.90)	27.60	29.76 (***)
35	33.24 (.66)	39.45 (1.01)	34.02	34.83 (***)	31.89 (.57)	39.92 (.85)	32.72	34.72 (***)
40	38.37 (.62)	44.38 (.95)	39.11	39.80 (***)	37.06 (.54)	44.82 (.80)	37.84	39.68 (***)
45	43.49 (.59)	49.31 (.90)	44.19	44.78 (***)	42.23 (.51)	49.73 (.76)	42.97	44.64 (***)
50	48.62 (.55)	54.24 (.85)	49.27	49.76 (***)	47.40 (.48)	54.63 (.71)	48.09	49.60 (***)
55	53.75 (.52)	59.17 (.79)	54.36	54.73 (***)	52.57 (.45)	59.53 (.67)	53.21	54.56 (***)
60	58.88 (.49)	64.11 (.74)	59.44	59.71 (***)	57.74 (.42)	64.44 (.62)	58.34	59.52 (***)
65	64.00 (.45)	69.04 (.69)	64.53	64.68 (***)	62.91 (.40)	69.34 (.58)	63.46	64.48 (***)
70	69.13 (.42)	73.97 (.63)	69.61	69.66 (***)	68.07 (.37)	74.25 (.54)	68.58	69.44 (***)
75	74.26 (.39)	78.90 (.58)	74.69	74.64 (***)	73.24 (.34)	79.15 (.49)	73.71	74.40 (***)
80	79.39 (.36)	83.83 (.53)	79.78	79.61 (.86)	78.41 (.31)	84.05 (.45)	78.83	79.36 (.80)
85	84.51 (.32)	88.76 (.48)	84.86	84.03 (.81)	83.58 (.28)	88.96 (.40)	83.95	83.48 (.69)
90	89.64 (.29)	93.69 (.43)	89.95	90.38 (.52)	88.75 (.25)	93.86 (.36)	89.07	89.65 (.60)
95	94.77 (.26)	98.63 (.38)	95.03	95.50 (.46)	93.92 (.23)	98.77 (.32)	94.20	95.04 (.37)
100	99.90 (.23)	103.56 (.33)	100.11	100.31 (.32)	99.09 (.20)	103.67 (.28)	99.32	99.84 (.30)
105	105.02 (.20)	108.49 (.28)	105.20	105.22 (.28)	104.26 (.18)	108.57 (.24)	104.44	104.76 (.26)
110	110.15 (.18)	113.42 (.24)	110.28	110.33 (.29)	109.43 (.16)	113.48 (.21)	109.57	109.78 (.23)
115	115.28 (.16)	118.35 (.21)	115.37	115.62 (.22)	114.59 (.14)	118.38 (.18)	114.69	114.73 (.19)
120	120.41 (.14)	123.28 (.18)	120.45	120.36 (.21)	119.76 (.12)	123.29 (.16)	119.81	119.51 (.18)
125	125.53 (.13)	128.21 (.17)	125.53	125.44 (.21)	124.93 (.12)	128.19 (.15)	124.94	124.47 (.17)

(continued)

Table 12 (cont.)

New Form Score	6-6 Tucker	6-6 Levine	6-6 Braun-Holland	6-6 Unsmoothed Equipercentile	6-T Tucker	6-T Levine	6-T Braun-Holland	6-T Unsmoothed Equipercentile
130	130.66 (.13)	133.14 (.17)	130.62	130.62 (.18)	130.10 (.11)	133.10 (.15)	130.06	129.81 (.17)
135	135.79 (.14)	138.08 (.19)	135.70	135.39 (.20)	135.27 (.12)	138.00 (.17)	135.18	134.86 (.18)
140	140.92 (.16)	143.01 (.22)	140.79	140.31 (.22)	140.44 (.14)	142.90 (.19)	140.31	140.03 (.20)
145	146.04 (.18)	147.94 (.26)	145.87	145.76 (.25)	145.61 (.15)	147.81 (.23)	145.43	145.53 (.22)
150	151.17 (.20)	152.87 (.31)	150.95	151.50 (.35)	150.78 (.18)	152.71 (.26)	150.55	151.22 (.28)
155	156.30 (.23)	157.80 (.36)	156.04	156.46 (.32)	155.94 (.20)	157.62 (.30)	155.67	156.43 (.29)
160	161.43 (.26)	162.73 (.40)	161.12	161.20 (.47)	161.11 (.22)	162.52 (.35)	160.80	161.33 (.42)
165	166.55 (.29)	167.66 (.45)	166.21	167.64 (.78)	166.28 (.25)	167.42 (.39)	165.92	167.60 (.71)
170	171.68 (.32)	172.60 (.51)	171.29	172.27 (***)	171.45 (.28)	172.33 (.43)	171.04	172.23 (***)
175	176.81 (.35)	177.53 (.56)	176.37	176.89 (***)	176.62 (.31)	177.23 (.47)	176.17	176.86 (***)
180	181.94 (.39)	182.46 (.61)	181.46	181.52 (***)	181.79 (.33)	182.14 (.52)	181.29	181.50 (***)
185	187.06 (.42)	187.39 (.66)	186.54	186.15 (***)	186.96 (.36)	187.04 (.56)	186.41	186.13 (***)
190	192.19 (.45)	192.32 (.71)	191.63	190.78 (***)	192.13 (.39)	191.94 (.61)	191.54	190.77 (***)
195	197.32 (.49)	197.25 (.77)	196.71	195.41 (***)	197.30 (.42)	196.85 (.65)	196.66	195.40 (***)
200	200.45 (.52)	202.18 (.82)	201.79	200.04 (***)	202.46 (.45)	201.75 (.70)	201.78	200.04 (***)

*** Standard error not available.

TABLE 13

Selected Raw Score Equivalents and Standard Errors on Link Form 2 for 9-9 and 9-T Equatings

New Form Score	9-9 Tucker	9-9 Levine	9-9 Braun-Holland	9-9 Unsmoothed Equipercentile	9-T Tucker	9-T Levine	9-T Braun-Holland	9-T Unsmoothed Equipercentile
0	-2.61 (.79)	5.77 (1.22)	-1.69	0.00 (***)	-4.77 (.73)	4.84 (1.11)	-3.76	-0.01 (***)
5	2.52 (.76)	10.67 (1.17)	3.39	4.96 (***)	0.42 (.70)	9.77 (1.06)	1.39	4.91 (***)
10	7.64 (.73)	15.56 (1.12)	8.48	9.92 (***)	5.61 (.67)	14.70 (1.02)	6.53	9.83 (***)
15	12.76 (.70)	20.46 (1.08)	13.57	14.89 (***)	10.80 (.65)	19.63 (.98)	11.68	14.74 (***)
20	17.89 (.67)	25.36 (1.03)	18.66	19.85 (***)	15.98 (.62)	24.56 (.93)	16.83	19.66 (***)
25	23.01 (.64)	30.25 (.98)	23.74	24.82 (***)	21.17 (.59)	29.48 (.89)	21.98	24.58 (***)
30	28.13 (.61)	35.15 (.93)	28.83	29.78 (***)	26.36 (.56)	34.41 (.85)	27.12	29.49 (***)
35	33.26 (.58)	40.05 (.89)	33.92	34.74 (***)	31.54 (.53)	39.34 (.80)	32.27	34.41 (***)
40	38.38 (.55)	44.94 (.84)	39.00	39.71 (***)	36.73 (.51)	44.27 (.76)	37.42	39.33 (***)
45	43.50 (.52)	49.84 (.79)	44.09	44.67 (***)	41.92 (.48)	49.20 (.72)	42.56	44.24 (***)
50	48.63 (.49)	54.74 (.74)	49.18	49.64 (***)	47.11 (.45)	54.13 (.68)	47.71	49.16 (***)
55	53.75 (.46)	59.64 (.70)	54.26	54.60 (***)	52.29 (.42)	59.06 (.63)	52.86	54.08 (***)
60	58.87 (.43)	64.53 (.65)	59.35	59.56 (***)	57.48 (.40)	63.98 (.59)	58.01	59.00 (***)
65	64.00 (.40)	69.43 (.60)	64.44	64.53 (***)	62.67 (.37)	68.91 (.55)	63.15	63.91 (***)
70	69.12 (.37)	74.33 (.56)	69.53	69.49 (***)	67.86 (.34)	73.84 (.51)	68.30	68.83 (***)
75	74.24 (.34)	79.22 (.51)	74.61	74.46 (***)	73.04 (.32)	78.77 (.46)	73.45	73.75 (***)
80	79.37 (.31)	84.12 (.47)	79.70	79.42 (***)	78.23 (.29)	83.70 (.42)	78.60	78.66 (***)
85	84.49 (.28)	89.02 (.42)	84.79	84.11 (.76)	83.42 (.26)	88.63 (.38)	83.74	83.03 (.62)
90	89.61 (.26)	93.91 (.38)	89.87	90.58 (.48)	88.60 (.24)	93.56 (.34)	88.89	89.30 (.54)
95	94.74 (.23)	98.81 (.33)	94.96	95.54 (.39)	93.79 (.21)	98.48 (.30)	94.04	94.81 (.37)
100	99.86 (.20)	103.71 (.29)	100.05	100.36 (.28)	98.98 (.19)	103.41 (.26)	99.18	99.74 (.28)
105	104.98 (.18)	108.60 (.25)	105.13	105.08 (.24)	104.17 (.17)	108.34 (.23)	104.33	104.66 (.24)
110	110.11 (.16)	113.50 (.21)	110.22	110.21 (.25)	109.35 (.15)	113.27 (.19)	109.48	109.71 (.21)
115	115.23 (.14)	118.40 (.18)	115.31	115.42 (.19)	114.54 (.13)	118.20 (.17)	114.63	114.65 (.17)
120	120.35 (.12)	123.29 (.16)	120.40	120.23 (.18)	119.73 (.12)	123.13 (.15)	119.77	119.51 (.17)
125	125.48 (.12)	128.19 (.15)	125.48	125.30 (.18)	124.91 (.11)	128.06 (.14)	124.92	124.54 (.16)

(continued)

Table 13 (cont.)

New Form Score	9-9 Tucker	9-9 Levine	9-9 Braun-Holland	9-9 Unsmoothed Equipercentile	9-T Tucker	9-T Levine	9-T Braun-Holland	9-T Unsmoothed Equipercentile
130	130.60 (.12)	133.09 (.15)	130.57	130.60 (.17)	130.10 (.11)	132.98 (.14)	130.07	129.90 (.16)
135	135.72 (.13)	178.98 (.17)	135.66	135.41 (.18)	135.29 (.12)	137.91 (.16)	135.22	134.90 (.17)
140	140.85 (.14)	142.88 (.20)	140.74	140.39 (.20)	140.48 (.13)	142.84 (.19)	140.36	140.08 (.19)
145	145.97 (.16)	147.78 (.24)	145.83	145.77 (.22)	145.66 (.15)	147.77 (.22)	145.51	145.58 (.21)
150	151.09 (.18)	152.67 (.28)	150.92	151.52 (.30)	150.85 (.17)	152.70 (.25)	150.66	151.22 (.28)
155	156.22 (.21)	157.57 (.32)	156.00	156.30 (.29)	156.04 (.19)	157.63 (.29)	155.80	156.35 (.28)
160	161.34 (.23)	162.47 (.36)	161.09	161.12 (.43)	161.23 (.22)	162.56 (.33)	160.95	161.33 (.41)
165	166.46 (.26)	167.37 (.40)	166.18	167.33 (.82)	166.41 (.24)	167.48 (.37)	166.10	167.84 (.67)
170	171.59 (.29)	172.26 (.45)	171.27	172.00 (***)	171.60 (.27)	172.41 (.41)	171.25	172.44 (***)
175	176.71 (.32)	177.16 (.50)	176.35	176.67 (***)	176.79 (.29)	177.34 (.45)	176.39	177.04 (***)
180	181.83 (.34)	182.06 (.54)	181.44	181.34 (***)	181.97 (.32)	182.27 (.49)	181.54	181.64 (***)
185	186.96 (.37)	186.95 (.59)	186.53	186.02 (***)	187.16 (.35)	187.20 (.54)	186.69	186.24 (***)
190	192.08 (.40)	191.85 (.63)	191.61	190.69 (***)	192.35 (.37)	192.13 (.58)	191.84	190.84 (***)
195	197.20 (.43)	196.75 (.68)	196.70	195.36 (***)	197.54 (.40)	197.06 (.62)	196.98	195.44 (***)
200	202.33 (.46)	201.64 (.73)	201.79	200.03 (***)	202.72 (.43)	201.98 (.66)	202.13	200.04 (***)

*** Standard error not available

TABLE 14

Selected Raw Score Equivalents and Standard Errors on Link Form 2 for L-L and L-T Equatings

New Form Score	L-L				L-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
0	-1.78 (.81)	2.99 (1.28)	-0.92	0.00 (***)	-4.15 (.72)	3.84 (1.11)	-3.24	-0.01 (***)
5	3.28 (.78)	7.98 (1.23)	4.11	4.95 (***)	1.01 (.69)	8.80 (1.06)	1.89	4.93 (***)
10	8.34 (.74)	12.97 (1.18)	9.13	9.91 (***)	6.18 (.67)	13.77 (1.02)	7.02	9.87 (***)
15	13.40 (.71)	17.96 (1.13)	14.16	14.86 (***)	11.35 (.64)	18.73 (.98)	12.16	14.80 (***)
20	18.46 (.68)	22.95 (1.08)	19.18	19.82 (***)	16.52 (.61)	23.70 (.93)	17.29	19.74 (***)
25	23.52 (.65)	27.93 (1.03)	24.20	24.78 (***)	21.69 (.58)	28.67 (.89)	22.42	24.68 (***)
30	28.57 (.62)	32.92 (.98)	29.23	29.73 (***)	26.85 (.56)	33.63 (.85)	27.55	29.61 (***)
35	33.63 (.59)	37.91 (.93)	34.25	34.69 (***)	32.02 (.53)	38.60 (.80)	32.68	34.55 (***)
40	38.69 (.56)	42.90 (.88)	39.28	39.64 (***)	37.19 (.50)	43.56 (.76)	37.81	39.49 (***)
45	43.75 (.53)	47.89 (.83)	44.30	44.60 (***)	42.36 (.47)	48.53 (.72)	42.94	44.42 (***)
50	48.81 (.50)	52.88 (.78)	49.32	49.56 (***)	47.52 (.45)	53.50 (.68)	48.07	49.36 (***)
55	53.87 (.47)	57.87 (.73)	54.35	54.51 (***)	52.69 (.42)	58.46 (.63)	53.21	54.30 (***)
60	58.93 (.44)	62.86 (.68)	59.37	59.47 (***)	57.86 (.39)	63.43 (.59)	58.34	59.23 (***)
65	63.99 (.41)	67.85 (.63)	64.39	64.42 (***)	63.03 (.36)	68.39 (.55)	63.47	64.17 (***)
70	69.05 (.38)	72.84 (.58)	69.42	69.38 (***)	68.19 (.34)	73.36 (.50)	68.60	69.11 (***)
75	74.11 (.35)	77.82 (.53)	74.44	74.34 (***)	73.36 (.31)	78.33 (.46)	73.73	74.04 (***)
80	79.16 (.32)	82.81 (.48)	79.47	79.61 (.71)	78.53 (.28)	83.29 (.42)	78.86	79.14 (.72)
85	84.22 (.29)	87.80 (.44)	84.49	83.46 (.67)	83.70 (.26)	88.26 (.38)	83.99	83.32 (.60)
90	89.28 (.26)	92.79 (.39)	89.51	89.94 (.63)	88.87 (.23)	93.22 (.34)	89.12	89.74 (.53)
95	94.34 (.23)	97.78 (.34)	94.54	95.11 (.37)	94.03 (.21)	98.19 (.30)	94.26	94.81 (.36)
100	99.40 (.20)	102.77 (.30)	99.56	100.16 (.28)	99.20 (.19)	103.16 (.26)	99.39	99.92 (.27)
105	104.46 (.18)	107.76 (.26)	104.58	105.05 (.25)	104.37 (.16)	108.12 (.23)	104.52	104.90 (.23)
110	109.52 (.16)	112.75 (.22)	109.61	109.96 (.24)	109.54 (.14)	113.09 (.19)	109.65	109.85 (.21)
115	114.58 (.14)	117.74 (.19)	114.63	114.86 (.19)	114.70 (.13)	118.05 (.17)	114.78	114.83 (.17)
120	119.64 (.13)	122.73 (.16)	119.66	119.53 (.18)	119.87 (.11)	123.02 (.15)	119.91	119.71 (.17)
125	124.69 (.12)	127.71 (.16)	124.68	124.32 (.17)	125.04 (.11)	127.99 (.14)	125.04	124.65 (.16)

(continued)

Table 14 (cont.)

New Form Score	L-L				L-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
130	129.75 (.12)	132.70 (.16)	129.70	129.25 (.18)	130.21 (.11)	132.95 (.14)	130.17	129.84 (.16)
135	134.81 (.13)	137.69 (.19)	134.73	134.29 (.19)	135.37 (.12)	137.92 (.16)	135.30	134.92 (.17)
140	139.87 (.15)	142.68 (.22)	139.75	139.40 (.20)	140.54 (.13)	142.88 (.19)	140.44	140.10 (.19)
145	144.93 (.17)	147.67 (.26)	144.78	144.69 (.24)	145.71 (.15)	147.85 (.22)	145.57	145.65 (.21)
150	149.99 (.19)	152.66 (.30)	149.80	150.18 (.35)	150.88 (.17)	152.82 (.25)	150.70	151.35 (.28)
155	155.05 (.22)	157.65 (.34)	154.82	155.99 (.33)	156.05 (.19)	157.78 (.29)	155.83	156.53 (.27)
160	160.11 (.24)	162.64 (.39)	159.85	160.79 (.42)	161.21 (.21)	162.75 (.33)	160.96	161.51 (.40)
165	165.17 (.27)	167.63 (.44)	164.87	166.95 (.79)	166.38 (.24)	167.72 (.37)	166.09	168.63 (.63)
170	170.22 (.30)	172.62 (.49)	169.89	171.68 (***)	171.55 (.26)	172.68 (.41)	171.22	173.12 (***)
175	175.28 (.33)	177.60 (.53)	174.92	176.40 (***)	176.72 (.29)	177.65 (.45)	176.35	177.61 (***)
180	180.34 (.36)	182.59 (.58)	179.94	181.13 (***)	181.88 (.32)	182.61 (.50)	181.49	182.10 (***)
185	185.40 (.39)	187.58 (.63)	184.97	185.85 (***)	187.05 (.34)	187.58 (.54)	186.62	186.59 (***)
190	190.46 (.42)	192.57 (.68)	189.99	190.58 (***)	192.22 (.37)	192.55 (.58)	191.75	191.08 (***)
195	195.52 (.45)	197.56 (.73)	195.01	195.30 (***)	197.39 (.40)	197.51 (.62)	196.88	195.56 (***)
200	200.58 (.48)	202.55 (.78)	200.04	200.03 (***)	202.55 (.42)	202.48 (.67)	202.01	200.05 (***)

*** Standard error not available.

TABLE 15

Selected Raw Score Equivalents and Standard Errors on Link Form 2 for 7-7 and 7-T Equatings

New Form Score	7-7 Tucker	7-7 Levine	7-7 Braun-Holland	7-7 Unsmoothed Equipercentile	7-T Tucker	7-T Levine	7-T Braun-Holland	7-T Unsmoothed Equipercentile
0	-3.95 (1.54)	4.97 (2.33)	-3.55	0.01 (***)	-1.97 (1.10)	4.56 (1.66)	-1.05	0.00 (***)
5	1.24 (1.48)	9.92 (2.23)	1.63	5.12 (***)	3.13 (1.06)	9.49 (1.59)	4.01	5.05 (***)
10	6.44 (1.42)	14.87 (2.14)	6.81	10.23 (***)	8.23 (1.02)	14.42 (1.53)	9.08	10.10 (***)
15	11.64 (1.36)	19.83 (2.05)	11.99	15.35 (***)	13.33 (.97)	19.35 (1.47)	14.14	15.15 (***)
20	16.83 (1.30)	24.78 (1.96)	17.17	20.46 (***)	18.44 (.93)	24.28 (1.40)	19.21	20.20 (***)
25	22.03 (1.24)	29.73 (1.87)	22.35	25.57 (***)	23.54 (.89)	29.22 (1.34)	24.27	25.25 (***)
30	27.23 (1.18)	34.69 (1.78)	27.53	30.68 (***)	28.64 (.85)	34.15 (1.27)	29.34	30.30 (***)
35	32.43 (1.12)	39.64 (1.68)	32.71	35.79 (***)	33.74 (.81)	39.08 (1.21)	34.40	35.35 (***)
40	37.62 (1.06)	44.59 (1.59)	37.89	40.90 (***)	38.84 (.77)	44.01 (1.14)	39.47	40.40 (***)
45	42.82 (1.00)	49.54 (1.50)	43.07	46.01 (***)	43.95 (.72)	48.94 (1.08)	44.53	45.45 (***)
50	48.02 (.94)	54.50 (1.41)	48.25	51.12 (***)	49.05 (.68)	53.87 (1.01)	49.60	50.50 (***)
55	53.21 (.89)	59.45 (1.32)	53.43	56.24 (***)	54.15 (.64)	58.80 (.95)	54.66	55.55 (***)
60	58.41 (.83)	64.40 (1.23)	58.61	61.35 (***)	59.25 (.60)	63.74 (.89)	59.73	60.60 (***)
65	63.61 (.77)	69.36 (1.14)	63.80	66.46 (***)	64.35 (.56)	68.67 (.82)	64.79	65.65 (***)
70	68.81 (.71)	74.31 (1.05)	68.98	71.57 (***)	69.46 (.52)	73.60 (.76)	69.86	70.70 (***)
75	74.00 (.66)	79.26 (.96)	74.16	76.68 (***)	74.56 (.48)	78.53 (.70)	74.92	75.75 (***)
80	79.20 (.60)	84.22 (.88)	79.34	81.77 (1.21)	79.66 (.44)	83.46 (.64)	79.99	80.47 (1.10)
85	84.40 (.55)	89.17 (.79)	84.52	84.92 (.92)	84.76 (.40)	88.39 (.57)	85.05	83.75 (1.01)
90	89.59 (.49)	94.12 (.70)	89.70	89.62 (1.15)	89.86 (.36)	93.32 (.51)	90.12	90.04 (.83)
95	94.79 (.44)	99.07 (.62)	94.88	95.61 (.69)	94.97 (.32)	98.25 (.45)	95.18	95.42 (.55)
100	99.99 (.39)	104.03 (.54)	100.06	100.61 (.52)	100.07 (.29)	103.19 (.40)	100.25	100.51 (.40)
105	105.19 (.35)	108.98 (.47)	105.24	105.25 (.44)	105.17 (.25)	108.12 (.34)	105.31	105.49 (.35)
110	110.38 (.30)	113.93 (.40)	110.42	110.48 (.46)	110.27 (.22)	113.05 (.29)	110.38	110.78 (.33)
115	115.58 (.27)	118.89 (.35)	115.60	115.71 (.42)	115.37 (.20)	117.98 (.25)	115.44	115.73 (.27)
120	120.78 (.25)	123.84 (.31)	120.78	120.62 (.36)	120.48 (.17)	122.91 (.22)	120.51	120.43 (.25)
125	125.97 (.24)	128.79 (.30)	125.97	125.14 (.33)	125.58 (.16)	127.84 (.20)	125.57	125.19 (.24)

(continued)

Table 15 (cont.)

New Form Score	7-7 Tucker	7-7 Levine	7-7 Braun-Holland	7-7 Unsmoothed Equipercentile	7-T Tucker	7-T Levine	7-T Braun-Holland	7-T Unsmoothed Equipercentile
130	131.17 (.24)	133.75 (.32)	131.15	130.41 (.38)	130.68 (.16)	132.77 (.21)	130.64	130.21 (.24)
135	136.37 (.26)	138.70 (.36)	136.33	135.91 (.40)	135.78 (.17)	137.70 (.23)	135.70	135.17 (.25)
140	141.57 (.29)	143.65 (.42)	141.51	141.69 (.46)	140.88 (.19)	142.64 (.27)	140.77	140.33 (.27)
145	146.76 (.33)	148.61 (.49)	146.69	147.26 (.45)	145.99 (.21)	147.57 (.32)	145.83	145.99 (.32)
150	151.96 (.38)	153.56 (.56)	151.87	152.35 (.60)	151.09 (.24)	152.50 (.37)	150.90	151.76 (.40)
155	157.16 (.43)	158.51 (.65)	157.05	157.47 (.63)	156.19 (.28)	157.43 (.43)	155.96	156.78 (.39)
160	162.35 (.48)	163.46 (.73)	162.23	163.78 (.98)	161.29 (.31)	162.36 (.49)	161.03	162.30 (.67)
165	167.55 (.53)	168.42 (.81)	167.41	169.14 (***)	166.39 (.35)	167.29 (.55)	166.09	168.36 (***)
170	172.75 (.59)	173.37 (.90)	172.59	173.56 (***)	171.50 (.39)	172.22 (.61)	171.16	172.89 (***)
175	177.94 (.64)	178.32 (.99)	177.77	177.97 (***)	176.60 (.43)	177.16 (.67)	176.22	177.42 (***)
180	183.14 (.70)	183.28 (1.08)	182.95	182.39 (***)	181.70 (.47)	182.09 (.73)	181.29	181.94 (***)
185	188.34 (.75)	188.23 (1.17)	188.14	186.81 (***)	186.80 (.51)	187.02 (.80)	186.35	186.47 (***)
190	193.54 (.81)	193.18 (1.26)	193.32	191.22 (***)	191.90 (.55)	191.95 (.86)	191.42	190.99 (***)
195	198.73 (.87)	198.14 (1.35)	198.50	195.64 (***)	197.00 (.59)	196.88 (.92)	196.48	195.52 (***)
200	203.93 (.93)	203.09 (1.44)	203.68	200.06 (***)	202.11 (.63)	201.81 (.99)	201.55	200.05 (***)

*** Standard error not available.

TABLE 16

Selected Raw Score Equivalents and Standard Errors on Link Form 2 for S-S and S-T Equatings

New Form Score	S-S				S-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
0	-11.09 (1.73)	2.95 (2.52)	-10.32	-0.03 (***)	-4.65 (1.26)	2.65 (1.95)	-4.22	-0.02 (***)
5	-5.63 (1.66)	7.95 (2.42)	-4.89	4.70 (***)	0.56 (1.21)	7.62 (1.88)	0.97	4.77 (***)
10	-0.16 (1.59)	12.96 (2.32)	0.55	9.43 (***)	5.77 (1.16)	12.59 (1.80)	6.16	9.57 (***)
15	5.31 (1.53)	17.96 (2.22)	5.98	14.15 (***)	10.98 (1.12)	17.56 (1.72)	11.35	14.36 (***)
20	10.77 (1.46)	22.96 (2.12)	11.42	18.88 (***)	16.19 (1.07)	22.53 (1.65)	16.55	19.15 (***)
25	16.24 (1.39)	27.97 (2.02)	16.85	23.61 (***)	21.40 (1.02)	27.51 (1.57)	21.74	23.94 (***)
30	21.70 (1.32)	32.97 (1.92)	22.29	28.34 (***)	26.61 (.97)	32.48 (1.49)	26.93	28.74 (***)
35	27.17 (1.26)	37.98 (1.82)	27.72	33.06 (***)	31.82 (.92)	37.45 (1.42)	32.12	33.53 (***)
40	32.64 (1.19)	42.98 (1.72)	33.16	37.79 (***)	37.03 (.87)	42.42 (1.34)	37.31	38.32 (***)
45	38.10 (1.12)	47.99 (1.62)	38.60	42.52 (***)	42.23 (.83)	47.39 (1.26)	42.50	43.12 (***)
50	43.57 (1.06)	52.99 (1.52)	44.03	47.24 (***)	47.44 (.78)	52.37 (1.19)	47.70	47.91 (***)
55	49.04 (.99)	58.00 (1.42)	49.47	51.97 (***)	52.65 (.73)	57.34 (1.11)	52.89	52.70 (***)
60	54.50 (.92)	63.00 (1.32)	54.90	56.70 (***)	57.86 (.68)	62.31 (1.04)	58.08	57.49 (***)
65	59.97 (.86)	68.01 (1.22)	60.34	61.43 (***)	63.07 (.64)	67.28 (.96)	63.27	62.29 (***)
70	65.44 (.79)	73.01 (1.13)	65.77	66.15 (***)	68.28 (.59)	72.25 (.89)	68.46	67.08 (***)
75	70.90 (.73)	78.01 (1.03)	71.21	70.88 (***)	73.49 (.54)	77.23 (.81)	73.65	71.87 (***)
80	76.37 (.67)	83.02 (.93)	76.64	75.84 (1.45)	78.70 (.50)	82.20 (.74)	78.85	77.06 (1.62)
85	81.84 (.61)	88.02 (.84)	82.08	80.89 (1.28)	83.91 (.45)	87.17 (.67)	84.04	82.38 (1.02)
90	87.30 (.54)	93.03 (.75)	87.51	88.06 (1.23)	89.11 (.41)	92.14 (.59)	89.23	89.12 (.96)
95	92.77 (.49)	98.03 (.66)	92.95	94.47 (.71)	94.32 (.36)	97.11 (.52)	94.42	96.09 (.55)
100	98.24 (.43)	103.04 (.57)	98.38	99.17 (.57)	99.53 (.32)	102.09 (.46)	99.61	100.51 (.43)
105	103.70 (.38)	108.04 (.49)	103.82	103.67 (.55)	104.74 (.28)	107.06 (.39)	104.80	104.98 (.39)
110	109.17 (.34)	113.05 (.42)	109.25	108.58 (.47)	109.95 (.25)	112.03 (.33)	110.00	109.86 (.36)
115	114.64 (.30)	118.05 (.37)	114.69	114.42 (.39)	115.16 (.22)	117.00 (.28)	115.19	115.20 (.29)
120	120.10 (.28)	123.06 (.34)	120.12	119.83 (.46)	120.37 (.19)	121.97 (.25)	120.38	120.30 (.28)
125	125.57 (.27)	128.06 (.33)	125.56	125.17 (.43)	125.58 (.18)	126.95 (.23)	125.57	125.28 (.28)

(continued)

Table 16 (cont.)

New Form Score	S-S				S-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
130	131.04 (.28)	133.06 (.36)	130.99	131.02 (.40)	130.78 (.18)	131.92 (.24)	130.76	130.79 (.27)
135	136.50 (.31)	138.07 (.41)	136.43	136.70 (.46)	135.99 (.20)	136.89 (.28)	135.96	135.76 (.29)
140	141.97 (.34)	143.07 (.48)	141.87	142.23 (.55)	141.20 (.22)	141.86 (.32)	141.15	140.71 (.31)
145	147.44 (.39)	148.08 (.56)	147.30	147.85 (.60)	146.41 (.25)	146.83 (.38)	146.34	146.20 (.38)
150	152.90 (.44)	153.08 (.64)	152.74	153.03 (.60)	151.62 (.29)	151.80 (.45)	151.53	152.08 (.49)
155	158.37 (.50)	158.09 (.73)	158.17	158.46 (.71)	156.83 (.33)	156.78 (.51)	156.72	157.51 (.51)
160	163.84 (.56)	163.09 (.82)	163.61	161.80 (.74)	162.04 (.37)	161.75 (.58)	161.91	162.28 (.82)
165	169.30 (.62)	168.10 (.92)	169.04	168.15 (***)	167.25 (.42)	166.72 (.65)	167.11	168.00 (***)
170	174.77 (.68)	173.10 (1.01)	174.48	172.71 (***)	172.46 (.46)	171.69 (.73)	172.30	172.57 (***)
175	180.24 (.74)	178.10 (1.11)	179.91	177.26 (***)	177.66 (.51)	176.66 (.80)	177.49	177.15 (***)
180	185.70 (.81)	183.11 (1.21)	185.35	181.82 (***)	182.87 (.55)	181.64 (.88)	182.68	181.73 (***)
185	191.17 (.87)	188.11 (1.31)	190.78	186.38 (***)	188.08 (.60)	186.61 (.95)	187.87	186.31 (***)
190	196.64 (.94)	193.12 (1.40)	196.22	190.93 (***)	193.29 (.65)	191.58 (1.03)	193.06	190.89 (***)
195	202.10 (1.00)	198.12 (1.50)	201.65	195.49 (***)	198.50 (.69)	196.55 (1.10)	198.26	195.46 (***)
200	207.57 (1.07)	203.13 (1.60)	207.09	200.04 (***)	203.71 (.74)	201.52 (1.18)	203.45	200.04 (***)

*** Standard Error not available.

TABLE 17

Selected Raw Score Equivalents and Standard Errors on Link Form 2 for C-C and C-T Equatings

New Form Score	C-C				C-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
0	-5.67 (1.22)	1.33 (1.83)	-5.77	-0.02 (***)	-1.57 (.84)	2.82 (1.31)	-0.60	0.00 (***)
5	-0.49 (1.17)	6.39 (1.76)	-0.60	4.76 (***)	3.50 (.81)	7.84 (1.26)	4.43	4.95 (***)
10	4.68 (1.12)	11.45 (1.69)	4.58	9.53 (***)	8.56 (.78)	12.85 (1.21)	9.46	9.90 (***)
15	9.85 (1.07)	16.51 (1.62)	9.76	14.31 (***)	13.63 (.74)	17.87 (1.16)	14.49	14.85 (***)
20	15.02 (1.03)	21.57 (1.54)	14.94	19.09 (***)	18.70 (.71)	22.88 (1.11)	19.51	19.80 (***)
25	20.20 (.98)	26.62 (1.47)	20.12	23.87 (***)	23.77 (.68)	27.89 (1.06)	24.54	24.75 (***)
30	25.37 (.93)	31.68 (1.40)	25.29	28.65 (***)	28.84 (.65)	32.91 (1.00)	29.57	29.70 (***)
35	30.54 (.88)	36.74 (1.33)	30.47	33.42 (***)	33.91 (.62)	37.92 (.95)	34.60	34.65 (***)
40	35.71 (.84)	41.80 (1.25)	35.65	38.20 (***)	38.97 (.59)	42.94 (.90)	39.63	39.60 (***)
45	40.89 (.79)	46.85 (1.18)	40.83	42.98 (***)	44.04 (.55)	47.95 (.85)	44.66	44.55 (***)
50	46.06 (.74)	51.91 (1.11)	46.00	47.76 (***)	49.11 (.52)	52.97 (.80)	49.69	49.50 (***)
55	51.23 (.70)	56.97 (1.04)	51.18	52.54 (***)	54.18 (.49)	57.98 (.75)	54.72	54.45 (***)
60	56.41 (.65)	62.03 (.97)	56.36	57.32 (***)	59.25 (.46)	62.99 (.70)	59.75	59.40 (***)
65	61.58 (.60)	67.09 (.90)	61.54	62.09 (***)	64.32 (.42)	68.01 (.65)	64.78	64.35 (***)
70	66.75 (.56)	72.14 (.82)	66.72	66.87 (***)	69.38 (.40)	73.02 (.60)	69.81	69.30 (***)
75	71.92 (.51)	77.20 (.75)	71.89	71.65 (***)	74.45 (.37)	78.04 (.55)	74.84	74.25 (***)
80	77.10 (.47)	82.26 (.69)	77.07	77.69 (1.39)	79.52 (.34)	83.05 (.50)	79.87	79.58 (.95)
85	82.27 (.43)	87.32 (.62)	82.25	82.48 (.73)	84.59 (.31)	88.06 (.46)	84.90	84.06 (.74)
90	87.44 (.38)	92.38 (.55)	87.43	87.67 (.76)	89.66 (.28)	93.08 (.41)	89.93	90.50 (.61)
95	92.61 (.34)	97.43 (.49)	92.60	93.88 (.64)	94.73 (.25)	98.09 (.36)	94.96	95.36 (.42)
100	97.79 (.30)	102.49 (.43)	97.78	99.04 (.41)	99.79 (.22)	103.11 (.32)	99.99	100.50 (.31)
105	102.96 (.27)	107.55 (.37)	102.96	104.22 (.38)	104.86 (.20)	108.12 (.27)	105.02	105.65 (.28)
110	108.13 (.24)	112.61 (.32)	108.14	108.91 (.32)	109.93 (.17)	113.14 (.24)	110.04	110.28 (.25)
115	113.31 (.21)	117.66 (.28)	113.31	113.47 (.28)	115.00 (.15)	118.15 (.20)	115.07	115.28 (.21)
120	118.48 (.20)	122.72 (.26)	118.49	118.26 (.30)	120.07 (.14)	123.16 (.18)	120.10	120.09 (.20)
125	123.65 (.19)	127.78 (.25)	123.67	122.83 (.28)	125.14 (.13)	128.18 (.16)	125.13	124.84 (.19)

(continued)

Table 17 (cont.)

New Form Score	C-C				C-T			
	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile	Tucker	Levine	Braun-Holland	Unsmoothed Equipercentile
130	128.82 (.20)	132.84 (.27)	128.85	127.64 (.29)	130.20 (.13)	133.19 (.17)	130.16	129.68 (.19)
135	134.00 (.22)	137.90 (.30)	134.03	133.01 (.33)	135.27 (.13)	138.21 (.19)	135.19	134.73 (.20)
140	139.17 (.25)	142.95 (.35)	139.20	138.72 (.35)	140.34 (.15)	143.22 (.22)	140.22	139.68 (.20)
145	144.34 (.28)	148.01 (.41)	144.38	144.54 (.44)	145.41 (.17)	148.23 (.25)	145.25	145.02 (.24)
150	149.51 (.32)	153.07 (.47)	149.56	150.26 (.58)	150.48 (.19)	153.25 (.29)	150.28	150.81 (.32)
155	154.69 (.35)	158.13 (.53)	154.74	156.49 (.56)	155.55 (.21)	158.26 (.34)	155.31	156.23 (.32)
160	159.86 (.40)	163.19 (.59)	159.91	162.75 (.93)	160.61 (.24)	163.28 (.38)	160.34	161.16 (.47)
165	165.03 (.44)	168.24 (.66)	165.09	169.28 (.84)	165.68 (.27)	168.29 (.43)	165.37	168.77 (.68)
170	170.21 (.48)	173.30 (.73)	170.27	173.67 (***)	170.75 (.30)	173.31 (.48)	170.40	173.24 (***)
175	175.38 (.53)	178.36 (.80)	175.45	178.07 (***)	175.82 (.33)	178.32 (.53)	175.43	177.71 (***)
180	180.55 (.57)	183.42 (.87)	180.63	182.47 (***)	180.89 (.36)	183.33 (.57)	180.46	182.18 (***)
185	185.72 (.62)	188.48 (.94)	185.80	186.87 (***)	185.96 (.39)	188.35 (.62)	185.49	186.64 (***)
190	190.90 (.66)	193.53 (1.01)	190.98	191.27 (***)	191.02 (.42)	193.36 (.67)	190.52	191.11 (***)
195	196.07 (.71)	198.59 (1.08)	196.16	195.66 (***)	196.09 (.45)	198.38 (.72)	195.55	195.58 (***)
200	201.24 (.76)	203.65 (1.16)	201.34	200.06 (***)	201.16 (.48)	203.39 (.77)	200.57	200.05 (***)

*** Standard error not available.

TABLE 18

Conversion Equation Slopes and Intercepts

Group	Statistic	Tucker	Levine	Braun-Holland
New form to link 1				
T-T	Slope	1.07	1.05	1.07
	Intercept	-6.90	-4.06	-6.39
5-5	Slope	1.06	1.07	1.06
	Intercept	-6.41	-7.75	-6.85
5-T	Slope	1.09	1.05	1.08
	Intercept	-9.68	-4.02	-9.35
6-6	Slope	1.08	1.04	1.07
	Intercept	-7.69	-2.63	-7.13
6-T	Slope	1.08	1.06	1.07
	Intercept	-8.04	-5.09	-7.34
9-9	Slope	1.07	1.04	1.07
	Intercept	-7.15	-2.78	-6.65
9-T	Slope	1.08	1.06	1.07
	Intercept	-7.88	-4.25	7.16
L-L	Slope	1.07	1.07	1.07
	Intercept	-6.52	-5.70	-6.10
L-T	Slope	1.07	1.07	1.07
	Intercept	-7.28	-5.35	-6.74
7-7	Slope	1.07	1.06	1.07
	Intercept	-7.10	-.450	-6.58
7-T	Slope	1.06	1.05	1.06
	Intercept	-4.79	-3.65	-4.58
S-S	Slope	-1.08	1.00	1.08
	Intercept	-9.67	1.50	-9.27
S-T	Slope	1.08	1.07	1.08
	Intercept	-6.72	-4.93	-6.94
C-C	Slope	1.05	1.07	1.05
	Intercept	-4.16	-5.96	-3.87
C-T	Slope	1.04	1.04	1.04
	Intercept	-4.02	-3.45	-3.80

(continued)

Table 18 (Cont.)

		Tucker	Levine	Braun-Holland
New form to link 2				
T-T	Slope	1.03	.99	1.03
	Intercept	-4.11	3.96	-3.21
5-5	Slope	1.07	1.03	1.06
	Intercept	-7.31	- .23	-6.04
5-T	Slope	1.05	.99	1.03
	Intercept	-6.38	3.73	-4.52
6-6	Slope	1.03	.99	1.02
	Intercept	-2.65	4.93	-1.57
6-T	Slope	1.03	.98	1.02
	Intercept	-4.29	5.59	-3.14
9-9	Slope	1.02	.98	1.02
	Intercept	-2.61	5.77	-1.69
9-T	Slope	1.04	.99	1.03
	Intercept	-4.77	4.84	-3.76
L-L	Slope	1.01	1.00	1.00
	Intercept	-1.78	2.99	- .92
L-T	Slope	1.03	.99	1.03
	Intercept	-4.15	3.84	-3.24
7-7	Slope	1.04	.99	1.04
	Intercept	-3.95	4.97	1.01
7-T	Slope	1.02	.99	1.01
	Intercept	-1.97	4.56	-1.05
S-S	Slope	1.09	1.00	1.09
	Intercept	-11.09	2.95	-10.32
S-T	Slope	1.04	.99	1.04
	Intercept	-4.65	2.65	-4.22
C-C	Slope	1.03	1.01	1.04
	Intercept	-5.67	1.33	-5.77
C-T	Slope	1.01	1.00	1.01
	Intercept	-1.57	2.82	- .60

TABLE 19

Unweighted Comparisons of Tucker Equating Results
Across Different Equatings

Equating Comparisons	Form 1			Form 2		
	Root Mean Square	Mean Absolute Difference	Mean Signed Difference	Root Mean Square	Mean Absolute Difference	Mean Signed Difference
55 - 5T	1.71	1.47	- .41	1.23	1.01	- .75
55 - TT	.97	.79	.69	1.94	1.68	- .13
5T - TT	1.47	1.20	1.10	1.14	.94	.61
66 - 6T	.19	.16	- .15	.94	.81	- .81
66 - TT	.44	.38	.04	.84	.73	- .73
6T - TT	.58	.50	.19	.10	.08	.08
99 - 9T	.46	.40	.06	1.15	.94	- .88
99 - TT	.15	.13	.13	.84	.70	- .69
9T - TT	.53	.46	.07	.33	.27	.19
LL - LT	.38	.31	- .23	1.28	1.10	- .20
LL - TT	.33	.33	- .33	1.24	1.07	- .23
LT - TT	.30	.26	- .10	.05	.04	- .03
77 - 7T	1.34	1.16	1.16	1.11	.96	.08
77 - TT	.12	.10	- .00	.90	.82	- .82
7T - TT	1.29	1.16	-1.16	1.15	.95	- .90
SS - ST	2.02	1.71	.69	3.26	2.75	1.29
SS - TT	1.38	1.15	- .66	3.63	3.11	.93
ST - TT	1.52	1.35	-1.35	.63	.52	- .36
CC - CT	2.81	2.34	1.37	2.34	2.01	2.01
CC - TT	1.58	1.35	1.34	1.39	1.38	1.38
CT - TT	1.62	1.41	- .03	1.27	1.06	- .62

TABLE 20

Unweighted Comparisons of Levine Equating Results Across Different Equatings

Equating Comparisons	Form 1			Form 2		
	Root Mean Square	Mean Absolute Difference	Mean Signed Difference	Root Mean Square	Mean Absolute Difference	Mean Signed Difference
55 - 5T	2.01	1.65	1.57	2.41	2.08	- .18
55 - TT	2.37	2.21	2.21	2.37	2.05	.11
5T - TT	.76	.65	.65	.29	.29	.29
66 - 6T	1.24	1.05	- .46	.34	.29	.11
66 - TT	.74	.61	- .53	.50	.41	- .35
6T - TT	.64	.55	- .07	.82	.68	- .46
99 - 9T	.89	.77	.06	.47	.39	- .29
99 - TT	.65	.55	- .23	.91	.75	- .50
9T - TT	.40	.33	- .29	.44	.37	- .20
LL - LT	.21	.18	- .00	.47	.39	.39
LL - TT	.91	.79	.07	.54	.45	.44
LT - TT	.71	.61	.07	.07	.06	.05
77 - 7T	.64	.62	.62	.88	.84	- .84
77 - TT	.23	.19	.17	.83	.82	- .82
7T - TT	.46	.46	- .46	.36	.32	.02
SS - ST	1.00	1.00	1.00	1.02	.95	- .95
SS - TT	.97	.79	.63	.52	.44	.17
ST - TT	.80	.67	- .37	1.13	1.12	1.12
CC - CT	2.48	2.07	-1.25	.80	.66	.62
CC - TT	2.99	2.58	- .48	1.32	1.09	.72
CT - TT	1.12	.91	.77	.61	.52	.10

TABLE 21

Unweighted Comparisons of Braun-Holland Equating Results Across Different Equatings

Equating Comparisons	Form 1			Form 2		
	Root Mean Square	Mean Absolute Difference	Mean Signed Difference	Root Mean Square	Mean Absolute Difference	Mean Signed Difference
55 - 5T	1.35	1.16	- .21	1.35	1.14	- .58
55 - TT	.94	.90	.90	1.76	1.52	- .19
5T - TT	1.55	1.26	1.12	.66	.54	.39
66 - 6T	.14	.13	- .13	.91	.79	- .79
66 - TT	.42	.36	.02	.92	.77	- .76
6T - TT	.48	.41	.15	.07	.06	.03
99 - 9T	.37	.32	.11	1.11	.91	- .86
99 - TT	.15	.13	.13	.84	.71	- .70
9T - TT	.43	.38	.03	.28	.23	.17
LL - LT	.32	.27	- .20	1.26	1.09	- .17
LL - TT	.31	.31	- .31	1.23	1.06	- .21
LT - TT	.29	.24	- .11	.05	.04	- .04
77 - 7T	1.22	1.10	1.10	1.36	1.17	.19
77 - TT	.11	.09	- .00	.94	.77	- .71
7T - TT	1.18	1.10	-1.10	1.16	.95	- .90
SS - ST	2.22	1.90	.61	3.08	2.60	1.23
SS - TT	1.26	1.06	- .59	3.69	3.16	.97
ST - TT	1.58	1.30	-1.21	.78	.67	- .26
CC - CT	2.75	2.29	1.32	2.80	2.31	2.20
CC - TT	1.61	1.36	1.34	1.67	1.57	1.57
CT - TT	1.52	1.31	.02	1.31	1.09	- .63

TABLE 22

Unweighted Comparisons of Equipercentile Equating Results Across Different Equatings

Equating Comparisons	Form 1			Form 2		
	Root Mean Square	Mean Absolute Difference	Mean Signed Difference	Root Mean Square	Mean Absolute Difference	Mean Signed Difference
55 - 5T	.96	.81	- .22	1.09	.95	.18
55 - TT	.77	.67	.22	1.10	.93	.21
5T - TT	.66	.53	.44	.34	.21	.03
66 - 6T	.19	.16	- .15	.39	.26	- .25
66 - TT	.21	.14	- .14	.47	.39	- .20
6T - TT	.13	.10	.01	.27	.18	.05
99 - 9T	.21	.16	- .01	.53	.44	- .33
99 - TT	.10	.06	.01	.49	.38	- .12
9T - TT	.17	.13	.01	.27	.22	.21
LL - LT	.18	.14	- .14	.56	.41	.22
LL - TT	.32	.28	- .28	.52	.36	.22
LT - TT	.18	.14	- .14	.07	.06	.00
77 - 7T	.73	.57	.57	.65	.52	- .48
77 - TT	.71	.55	- .19	1.25	1.02	-1.02
7T - TT	.90	.76	- .76	.72	.58	- .54
SS - ST	1.32	1.11	.32	.83	.65	.32
SS - TT	.36	.24	.07	1.64	1.30	.69
ST - TT	1.24	1.06	- .25	1.05	.84	.37
CC - CT	2.11	1.51	1.26	1.45	1.22	1.02
CC - TT	2.09	1.53	1.52	1.32	1.12	.90
CT - TT	.55	.32	.26	.32	.22	- .11

TABLE 23

Weighted Comparisons of Tucker Equating Results
Across Different Equatings

Equating Comparisons	Form 1			Form 2		
	Root Mean Square	Mean Absolute Difference	Mean Signed Difference	Root Mean Square	Mean Absolute Difference	Mean signed Difference
55 - 5T	.62	.51	.39	1.25	1.22	-1.22
55 - TT	1.04	1.02	1.02	1.20	1.08	-1.06
5T - TT	.69	.63	.63	.32	.25	.15
66 - 6T	.10	.10	- .10	.59	.58	- .58
66 - TT	.22	.19	- .18	.54	.52	- .52
6T - TT	.18	.14	- .08	.06	.06	.06
99 - 9T	.31	.28	.28	.57	.52	- .52
99 - TT	.10	.10	.10	.48	.46	- .46
9T - TT	.24	.20	- .18	.10	.08	.06
LL - LT	.12	.10	- .08	.55	.46	.41
LL - TT	.32	.32	- .32	.50	.42	.36
LT - TT	.25	.24	- .24	.05	.05	- .05
77 - 7T	.86	.84	.84	.55	.48	- .45
77 - TT	.07	.06	- .06	1.01	1.00	-1.00
7T - TT	.91	.90	- .90	.59	.55	- .55
SS - ST	1.69	1.60	1.60	.87	.70	- .14
SS - TT	.36	.28	- .08	1.26	1.05	- .75
ST - TT	1.69	1.68	-1.68	.63	.61	- .61
CC - CT	.73	.58	.19	1.47	1.42	1.42
CC - TT	.97	.95	.95	1.33	1.33	1.33
CT - TT	.89	.78	.75	.33	.26	- .09

TABLE 24

Weighted Comparisons of Levine Equating Results
Across Different Equatings

Equating Comparisons	Form 1			Form 2		
	Root Mean Square	Mean Absolute Difference	Mean Signed Difference	Root Mean Square	Mean Absolute Difference	Mean Signed Difference
55 - 5T	1.03	.96	.96	1.50	1.35	-1.33
55 - TT	1.82	1.80	1.80	1.23	1.08	-1.03
5T - TT	.85	.84	.84	.30	.30	.30
66 - 6T	.35	.28	.09	.10	.08	- .04
66 - TT	.31	.28	- .27	.20	.17	- .17
6T - TT	.41	.37	- .37	.24	.19	- .13
99 - 9T	.55	.50	.49	.16	.13	- .12
99 - TT	.19	.15	.06	.26	.20	- .13
9T - TT	.43	.43	- .43	.11	.09	- .01
LL - LT	.12	.10	- .10	.27	.26	.26
LL - TT	.45	.39	- .37	.31	.29	.29
LT - TT	.34	.29	- .27	.04	.03	.03
77 - 7T	.56	.56	.56	.97	.96	- .96
77 - TT	.10	.09	.09	.77	.76	- .76
7T - TT	.47	.47	- .47	.23	.20	.20
SS - ST	.99	.99	.99	1.14	1.13	-1.13
SS - TT	.35	.29	.28	.15	.12	- .06
ST - TT	.74	.71	- .71	1.07	1.07	1.07
CC - CT	.66	.52	- .22	.40	.37	.37
CC - TT	1.27	1.08	.94	.37	.29	.19
CT - TT	1.18	1.16	1.16	.25	.21	- .18

TABLE 25

Weighted Comparisons of Braun-Holland Equating Results
Across Different Equatings

Equating Comparisons	Form 1			Form 2		
	Root Mean Square	Mean Absolute Difference	Mean Signed Difference	Root Mean Square	Mean Absolute Difference	Mean Signed Difference
55 - 5T	.57	.49	.43	1.22	1.17	-1.17
55 - TT	1.03	1.03	1.03	1.15	1.04	-1.03
5T - TT	.68	.60	.60	.20	.16	.14
66 - 6T	.11	.11	- .11	.59	.57	- .57
66 - TT	.22	.19	- .18	.54	.52	- .52
6T - TT	.15	.12	- .07	.06	.06	.06
99 - 9T	.30	.28	.28	.56	.53	- .53
99 - TT	.10	.09	.09	.49	.47	- .47
9T - TT	.22	.19	- .18	.09	.07	.06
LL - LT	.11	.09	- .08	.56	.47	.42
LL - TT	.32	.32	- .32	.51	.43	.37
LT - TT	.25	.24	- .24	.05	.05	- .05
77 - 7T	.86	.85	.85	.60	.51	- .46
77 - TT	.06	.05	- .05	1.02	1.00	-1.00
7T - TT	.91	.90	- .90	.58	.55	- .54
SS - ST	1.75	1.65	1.64	.83	.66	- .13
SS - TT	.33	.26	- .06	1.27	1.05	- .74
ST - TT	1.72	1.70	-1.70	.65	.62	- .62
CC - CT	.71	.56	.16	1.46	1.38	1.38
CC - TT	.95	.92	.92	1.30	1.29	1.29
CT - TT	.87	.77	.75	.34	.27	- .08

TABLE 26

Weighted Comparisons of Equipercentile Equating Results
Across Different Equatings

Equating Comparisons	Form 1			Form 2		
	Root Mean Square	Mean Absolute Difference	Mean Signed Difference	Root Mean Square	Mean Absolute Difference	Mean Signed Difference
55 - 5T	.70	.62	.42	1.29	1.20	-1.14
55 - TT	1.09	1.04	1.01	1.26	1.12	-1.02
5T - TT	.69	.62	.59	.33	.21	.12
66 - 6T	.18	.15	- .11	.65	.58	- .57
66 - TT	.26	.20	- .19	.60	.54	- .51
6T - TT	.17	.15	- .08	.11	.07	.06
99 - 9T	.36	.32	.28	.60	.54	- .52
99 - TT	.16	.14	.09	.55	.50	- .46
9T - TT	.25	.21	- .19	.13	.09	.06
LL - LT	.13	.09	- .08	.58	.49	.42
LL - TT	.33	.32	- .32	.53	.44	.37
LT - TT	.25	.24	- .24	.06	.06	- .05
77 - 7T	.90	.85	.85	.74	.54	- .45
77 - TT	.36	.26	- .05	1.11	1.00	-1.00
7T - TT	.94	.90	- .90	.61	.55	- .55
SS - ST	1.77	1.67	1.63	.99	.85	- .13
SS - TT	.49	.43	- .06	1.44	1.26	- .74
ST - TT	1.76	1.72	-1.69	.73	.67	- .61
CC - CT	.90	.71	.14	1.61	1.49	1.42
CC - TT	1.05	.92	.91	1.50	1.40	1.35
CT - TT	.93	.79	.77	.39	.34	-.07

TABLE 27

Summary Indicating "Best" Linking Group Under Various Conditions

	Link Form 1								Link Form 2							
	Unweighted				Weighted				Unweighted				Weighted			
	T	L	B	E	T	L	B	E	T	L	B	E	T	L	B	E
5	55	5T	55	5T	5T	5T	5T	5T	5T	5T	5T	5T	5T	5T	5T	5T
6	66	6T	66	6T	6T	66	6T	6T	6T	66	6T	6T	6T	66	6T	6T
9	99	9T	99	99	99	99	99	99	9T	9T	9T	9T	9T	9T	9T	9T
L	LT	LT	LT	LT	LT	LT	LT	LT	LT	LT	LT	LT	LT	LT	LT	LT
7	77	77	77	77	77	77	77	77	77	7T	77	7T	7T	7T	7T	7T
S	SS	ST	SS	SS	SS	SS	SS	SS	ST	SS	ST	ST	ST	SS	ST	ST
C	CC	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT

T = Tucker
L = Levine
B = Braun-Holland
E = Equipercentile