DOCUMENT RESUME

ED 314 498 TM 014 421

AUTHOR Melancon, Janet G.; Thompson, Bruce
TITLE Latent Trait Calibrations for the Finding Embedded Figures Test: A Study with Middle School Students.
PUB DATE Jan 90
NOTE 59p.; Paper presented at the Annual Meeting of the Southwest Educational Research Association (Austin, TX, January 25-27, 1990).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Cognitive Processes; Comparative Testing; Field Dependence Independence; *Item Response Theory; Junior High Schools; *Junior High School Students; *Middle Schools; Multiple Choice Tests; *Perception Tests; *Psychometrics; Test Format; *Test Interpretation; Test Reliability; Undergraduate Students
IDENTIFIERS *Finding Embedded Figures Test; Rasch Model; Robustness

ABSTRACT

Latent trait measurement theory was used to investigate the measurement characteristics of both parts of a multiple-choice measure of field-independence, the Finding Embedded Figures Test (FEFT). Analysis was based on data provided by 1,528 students enrolled in one of two middle schools located in the southern United States. Of the subjects, 731 completed only Part A of the FEFT; 737 completed only Part B of the FEFT; and 60 complet 1 both parts of the FEFT. Latent trait analyses of FEFT data from 302 undergraduate students previously studied provided a basis for comparison. Results suggest that the FEFT parts provided data with reasonable psychometric integrity. In addition to presenting results associated with the FEFT parts, the study provided a model for presenting and interpreting Rasch latent trait results. Ten tables provide study data and 20 figures illustrate the measurement characteristics. (SLD)

ft8late.wp 1/6/90

LATENT TRAIT CALIBRATIONS FOR THE FINDING EMBEDDED FIGURES TEST: A STUDY WITH MIDDLE SCHOOL STUDENTS

Janet G. Melancon
Loyola University

Bruce Thompson
University of New Orleans

Paper presented at the annual meeting of the Southwest Educational Research Association, Austin, TX, January 25, 1990. Request reprints from: Bruce Thompson, Research Professor of Education, College of Education, University of New Orleans, New Orleans, LA 70148.

ABSTRACT

The study applied latent trait measurement theory to investigate the measurement characteristics of both parts of a multiple choice measure of field-independence, the Finding Embedded Figures Test. Analysis was based on data provided by 1,528 middle school students. Latent trait analyses of FEFT data from 302 undergraduate students provided a basis for comparison. Results suggest that the FEFT parts provide data with reasonable psychometric integrity. In addition to presenting results associated with the FEFT parts, the paper also provides a model for presenting and interpreting Rasch latent trait results.

The most frequently used measure of the cognitive style called field independence is the Group Embedded Figures Test (Witkin, Oltman, Raskin & Karp, 1971). The Group Embedded Figures Test (GEFT) has been frequently used in part because the measure has exceptional psychometric integrity, even when evaluated by sophisticated measurement theory such as generalizability theory (Thompson & Melancon, 1987b), or when used with children (Thompson, Pitts & Gipe, 1983).

Although the GEFT has proven to be a very useful measure of aspects of field independence, the measure does have some limitations. The primary limitation is that the GEFT employs a "supply" format in which subjects actually draw on the target figure embedded within a stimulus. As Donlon (1977, pp. 1-2) notes, "From the standpoint of a large-scale administration, however, the GEFT has the drawback of requiring trained personnel to score each item."

Melancon and Thompson (1987) present in detail the first phase of development of a multiple-choice perceptual disembedding measure, the Finding Embedded Figures Test (FEFT). The FEFT (Thompson & Melancon, 1987a) was developed to provide a multiple-choice, machine-scoreable measure of perceptual disembedding or restructuring as an alternative to supply-format tests such as the GEFT. A multiple-choice test avoids difficulties associated with supply-format requirements for use of scorers and concerns about interrater reliability. The FEFT was also developed in the expectation that the use of another measure might shed additional

light on the nature of the field-independence construct (Linn & Kyllonen, 1980, p. 1).

A five-choice item response format was selected for use on the Finding Embedded Figures Test (FEFT) in order to maximize "true" test length and reliability (Thompson & Levitov, 1985, pp. 164-165). An initial item pool of 110 items was developed (Melancon & Thompson, 1987). Each item presents a target figure which is located in only one of the five response alternatives. As used in the present study, subjects respond to each item by indicating the letter code for the response alternative containing the target.

Melancon and Thompson (1987) calculated item-to-total FEFT score correlation coefficients, i.e., correlation coefficients between item scores ("0" or "1") and total FEFT test scores; these coefficients were reported as "internal validity" coefficients. The researchers also reported "external validity" correlation coefficients, i.e., coefficients between total FEFT item scores and total GEFT scores, as well as "total validity" coefficients, i.e., coefficients between FEFT item scores and scores on the combination of the FEFT and the GEFT measures. Since the last coefficients involved the most information, they were considered to be especially important in making decisions about eventual item retention.

Based on the results in the initial study of the pool of 110 items, two parts ("A" and "B") of the FEFT were developed. Both Part "A" and Part "B" of the FEFT consist of the 35 scored items.

The parts each share 15 "linking" or common items. The linking items can be employed to equate scores across parts, or to estimate group test-retest reliability or intraindividual response stability when both parts are administered to subjects.

The considered development efforts reported previously (Melancon & Thompson, 1987) may have optimized the measurement integrity of the FEFT. The present study was conducted to evaluate the measurement integrity of the two final parts of the FEFT. Specifically, the present study was conducted to evaluate the measurement characteristics of the FEFT using one-parameter latent trait measurement theory (McKinley, 1989; McKinley & Mills, 1989; Wright & Stone, 1979). Latent trait measurement theory is a powerful approach to evaluating measurement integrity (Traub & Wolfe, 1981), as explained by Thompson and Barnitz (1981) and illustrated by Pitts and Thompson (1984).

FEFT item characteristics have been explored in various studies employing diverse test administration and sample types (Melancon & Thompson, 1987, 1989a, 1989b, 1989c, 1989d, 1990, in press; Thompson & Melancon, 1988). However, these studies utilized classical test theory to evaluate results. The use of latent trait theory in the present study allows the exploration of the robustness of findings across analytic methods. The latent trait results with middle school students reported here can also be compared with latent trait results with 302 undergraduate math students reported by Melancon and Thompson (1988).

Method

Subjects

Subjects (n=1,528) were students enrolled in one of two middle schools located in the southern United States. Both schools had achievement profiles that were roughly average. Slightly more students (52.2%) were female rather than male. The mean age of the students was 12.78 (SD=1.18).

Roughly half of the subjects (n_1=731, 731/1528 = 47.8%) completed only Part A of the FEFT. Roughly half of the subjects (n_2=737, 737/1528 = 48.2%) completed only Part B of the FEFT. A third group of subjects (n_3=60, 60/1528 = 3.9%) completed both FEFT parts.

Results

As noted in explanations of one-parameter latent trait measurement theory (e.g., Lawson, 1989; Thompson & Barnitz, 1981), one important feature of this measurement approach is that the measurement model presumes that subjects should get items correct based **solely** on their latent abilities. Thus, a subject with the ability to correctly answer 25 items should get the 25 easiest items right, and the remaining items should be incorrectly answered.

It is quite noteworthy that the one-parameter latent trait measurement theory can be employed to identify which subjects, if any, substantially deviate from performance expectations. Such subjects can be removed from further analysis. The ability to identify such subjects is important to efforts to interpret

results provided only by subjects who were consistent in their behavior and who systematically made their best attempts to correctly answer test items. Of course, when few subjects deviate from these performance expectations, such results also allow the researcher to vest more confidence in interpretations grounded in a given set of data.

An initial step in the analysis requires that all subjects with zero correct answers or with perfect scores be deleted from the analysis. Such subjects have no item response variance that can be considered in the analysis. On this basis, three of the 791 (731+60) subjects who completed Part A and made perfect scores on the set of 35 Part A items were removed from the analysis. None of the 797 (737+60) subjects who completed Part B were removed from the analysis. None of the 60 subjects who completed both FEFT parts had zero or perfect scores on the combined set of 70 (35+35) items.

However, an additional 22 subjects who completed FEFT Part A had response patterns that deviated significantly from model expectations, i.e., these subjects missed too many items they were expected to get correct, got too many items correct that they were expected to get incorrect, or both. These subjects had latent trait "fit" $\underline{t}$ statistics that were highly improbable, and these subjects were therefore excluded from further analyses. In the present analysis, a $\underline{t}$ statistic greater than 2.0 was deemed sufficiently improbable to consider a person response pattern aberrant. Twenty four (24) of the subjects who completed FEFT Part B were excluded from further analyses on this basis. Six (6) subjects who completed

the full FEFT were omitted from the analysis involving all 70 FEFT items. As noted previously, the ability to detect such response patterns, and to omit such subjects from analyses, is an important benefit from the use of latent trait analysis. Classical theory will support similar analyses, as Lawson (1989) emphasizes, but such analyses are not conventional in classical measurement.

A second noteworthy feature of latent trait measurement is that, if the model fits the data, estimates of latent person ability will be independent of the sample of items, i.e., will generalize across item samples. Figure 1 presents the "item characteristic curve" that ties raw scores to latent "log ability" estimates for the FEFT Part A data in the present study. Figure 2 presents comparable results for the FEFT Part B data. Figure 3 presents these results for the 54 (60-6) middle school students who completed both FEFT parts.

INSERT FIGURES 1, 2, AND 3 ABOUT HERE.

A third noteworthy feature of latent trait measurement is that, if the model fits the data, estimates of item difficulty calibrations will be independent of the sample of persons, i.e., will generalize across samples of people. Thus, latent trait results for 302 undergraduate math students (Melancon & Thompson, 1988) should be comparable to those reported here for 1,528 middle school students. One way to evaluate whether the latent trait model fits the data, i.e., that item difficulty calibrations generalize

across person samples, is to divide the sample into subgroups and then conduct separate item calibrations. These results are presented for FEFT Part A, FEFT Part B, and the combined set of 70 items in Tables 1, 3 and 5, respectively. The Table 1 and 3 results for FEFT Parts A and B for middle school students can be compared with comparable analyses for undergraduate math students (Melancon & Thompson, 1988) reported in Tables 2 and 4, respectively.

INSERT TABLES 1 THROUGH 5 ABOUT HERE.

A fourth noteworthy feature of latent trait measurement is that the model can be used to detect items that deviate too substantially from performance expectations, i.e., are answered correctly by too many persons with lower ability or are missed by too many persons with higher ability. Furthermore, if few or no items deviate from model expectations, more confidence can be vested in conclusions about measurement integrity based on results. Tables 6, 8 and 10 present the FEFT items listed in order of the item "fit" $\underline{t}$ statistics. Items with $\underline{t}$ statistics greater than roughly 2.0 or 2.1 in absolute value can be considered as having deviated rather substantially from model expectations. Tables 7 and 9 present related analyses from the previous study (Melancon & Thompson, 1988) of undergraduate math students.

INSERT TABLES 6 THROUGH 10 ABOUT HERE.

Only 22 out of 791 (22/791 = 2.8%) subjects for Part A analyses, 24 out of 797 (24/797 = 3.0%) subjects for Part B analyses, and six out of 60 (6/60 = 10%) subjects for the combined Parts A and B analyses substantially deviated ($\underline{t}>|2.0|$) from latent trait measurement model expectations. Only items ("A*10", "A030", "B020", "B030", "B*05","B012", "B*22", and "B003") substantially deviated from model expectations (total $\underline{t}>|2.1|$) for analyses reported in Tables 6 and 8. In the comparable analyses for undergraduate students (Melancon & Thompson, 1988) reported in Tables 7 and 9, only three ("A030", "B004", and "B025") substantially deviated ($\underline{t}>|2.0|$) from model expectations.

It is interesting to compare the fit statistics for the three linking items ("A*10", "B*05", and B*22") isolated as misfitting in results reported in Tables 6 and 8. If these items are indeed deviant then it would be reasonable to expect that their bad fit statistics would be replicated in both analyses. Item "B*05" is the second linking item in both FEFT parts, so the fifth item in FEFT Part B is exactly the same as item "A*06" in FEFT Part B. The fit statistics for this item as used in Parts A and B, respectively, are -1.24 (for "A*06") and -4.03 (for "B*05"). The fit statistics for the fifth linking item in both parts are, respectively, +4.17 (for "A*10") and -1.27 (for "B*11"). The fit statistics for the eleventh linking item in both parts are, respectively, +0.26 (for "A*20") and -2.13 (for "B*22).

The fact that these three linking items are not consistently deviant across analyses suggests that their misfit statistics may

in part be sample artifacts. This possibility is also suggested by the results reported in Table 10, for the analysis involving 54 middle school students (60-6) and all 70 FEFT items, since no items dramatically deviated from model expectations. The measurement model should be more fully elaborated in this analysis, since all 70 items were employed, so some confidence should be vested in these results.

Because the preponderance of both subjects and items involved behavior closely corresponding with the expectations of the latent trait measurement model, the model can be employed to present meaningful "maps" of both people and items on the latent ability variables for FEFT Parts A and B. These maps are presented in Figures 4, 6, and 8 for the present study. Figures 5 and 7 present comparable results from the Melancon and Thompson (1988) study with 302 college students.

INSERT FIGURES 4 THROUGH 8 ABOUT HERE.

Additional analyses can be conducted to identify whether item fit systematically differs across item difficulty. Figures 9 through 14 present plots of item fit statistics with latent trait item difficulty calibrations. Figures 15 through 17 provide the basis for determining whether item fit differs systematically across item discrimination. Figures 18 and 20 can be used to isolate items that "misfit" across two evaluations of item behavior, i.e., "total" and "between" statistics.

INSERT FIGURES 9 THROUGH 20 ABOUT HERE.

Discussion

The analysis of the Finding Embedded Figures Test's item characteristics using the one-parameter latent trait measurement theory indicated that the FEFT items generally performed in accord with expectations. As noted previously, relatively few subjects' performances on FEFT items substantially deviated from model expectations. As reported in Tables 6, 8 and 10, relatively few items deviated substantially from model expectations in the response patterns that they elicited. For the analysis reported in Table 10 and involving a measurement model defined by all 70 FEFT items, no items substantially deviated from model expectations.

Across the present study and the previous study with undergraduate students (Melancon & Thompson, 1988), only item "A030" has consistently been identified as yielding substantially unexpected response patterns. Figures 9 through 17 indicate that item fit was not a systematic function of item difficulty or discrimination. Thus, the items are reasonable markers for latent ability throughout the range of the variable.

The cognitive style of field independence has attracted serious interest among researchers. As Heesacker (1981, p. 2) notes,

> Since the early 1960s literally hundreds of research

papers have looked at various aspects of field dependence. Field dependence is currently one of the most popular research topics in psychology.

The present study was conducted to investigate the measurement integrity of the Finding Embedded Figures Test (FEFT), a measure developed (Thompson & Melancon, 1987a) based on studies reported by Melancon and Thompson (1987). The FEFT has a multiple-choice format that may facilitate administration and scoring in comparison with the use of supply-format tests such as the GEFT. The results of the present study indicate that the FEFT parts have reasonable psychometric integrity.

References

Donlon, T. F. (1977, May). A practical assessment of field dependence/independence. Paper presented at the annual meeting of the New England Educational Research Association, Manchester-Bedford, NH. (ERIC Document Reproduction Service No. ED 139 827)

Heesacker, M. (1981, August). A review of the history of field dependence. Paper presented at the annual meeting of the American Psychological Association, Los Angeles. (ERIC Document Reproduction Service No. ED 211 888)

Lawson, S. (1989, November). Latent trait measurement: Do the results justify the effort? Paper presented at the annual meeting of the Mid-South Educational Research Association, Little Rock, AR. (ERIC Document Reproduction Service No. forthcoming)

Linn, M. C., & Kyllonen, P. (1980, April). The field dependence-independence construct: Some, one or none. Paper presented at the annual meeting of the American Educational Research Association, Boston. (ERIC Document Reproduction Service No. ED 193 252)

McKinley, R.L. (1989). An introduction to item response theory. Measurement and Evaluation in Counseling and Development, 22(1), 37-57.

McKinley, R.L., & Mills, C.N. (1989). Item response theory: Advances in achievement and attitude measurement. In B. Thompson (Ed.), Advances in social science methodology (pp.

71-135, Vol. 1). Greenwich, CT: JAI Press.

Melancon, J. G., & Thompson, B. (1987, November). Measurement characteristics of a test of field-independence: Literature review and development of the Finding Embedded Figures Test. Paper presented at the annual meeting of the Mid-South Educational Research Association, Mobile, AL. (ERIC Document Reproduction Service No. ED 292 823)

Melancon, J. G., & Thompson, B. (1988, November). Latent trait measurement calibrations for the Finding Embedded Figures Test. Paper presented at the annual meeting of the Mid-South Educational Research Association, Louisville, KY. (ERIC Document Reproduction Service No. ED 300 463)

Melancon, J., & Thompson, B. (1989a). Measurement characteristics of the Finding Embedded Figures Test. Psychology in the Schools, 26(1), 69-78.

Melancon, J.G., & Thompson, B. (1989b, November). Measurement characteristics of the Finding Embedded Figures Test with middle school students. Paper presented at the annual meeting of the Mid-South Educational Research Association, Little Rock, AR. (ERIC Document Reproduction Service No. forthcoming)

Melancon, J., & Thompson, B. (1989c, January). Measurement characteristics of a "no-guessing" administration of the Finding Embedded Figures Test. Paper presented at the annual meeting of the Southwest Educational Research Association, Houston. (ERIC Document Reproduction Service No. ED 303 487)

Melancon, J., & Thompson, B. (1989d, January). The nature of field

independence: percentiles and factor structure of the Finding Embedded Figures Test--Research Edition. Paper presented at the annual meeting of the Southwest Educational Research Association, Houston. (ERIC Document Reproduction Service No. ED 303 520)

Melancon, J.G., & Thompson, B. (1990, January). Measurement characteristics of the Finding Embedded Figures Test in "speed" versus "power" administrations. Paper presented at the annual meeting of the Southwest Educational Research Association, Austin, TX.

Melancon, J.G., & Thompson, B. (in press). Maximizing test reliability by stepwise variable deletion: A case study with the Finding Embedded Figures Test. Psychological Reports.

Pitts, M. C., & Thompson, B. (1984). Cognitive styles as mediating variables in inferential comprehension. Reading Research Quarterly, 19, 426-435.

Thompson, B., & Barnitz, J. (1981, January). Applications of latent trait measurement in reading research. Paper presented at the annual meeting of the Southwest Educational Research Association, Dallas. (ERIC Document Reproduction Service No. ED 199 266)

Thompson, B., & Levitov, J. E. (1985). Using microcomputers to score and evaluate test items. Collegiate Microcomputer, 3, 163-168.

Thompson, B., & Melancon, J. (1987a). Finding Embedded Figures Test. New Orleans: Psychometrics Group.

Thompson, B., & Melancon, J. G. (1987b). Measurement characteristics of the Group Embedded Figures Test. Educational and Psychological Measurement, 47, 765-772.

Thompson, B., & Melancon, J. (1988, January). Phase two study of the measurement characteristics of a test of field-independence. Paper presented at the annual meeting of the Southwest Educational Research Association, San Antonio.

Thompson, B., Pitts, M. M., & Gipe, J. P. (1983). Use of the Group Embedded Figures Test with children. Perceptual and Motor Skills, 57, 199-203.

Traub, R.E., & Wolfe, R.G. (1981). Latent trait theories and the assessment of educational achievement. In D.C. Berliner (Ed.), Review of research in education (Vol. 9). Washington, DC: American Educational Research Association.

Witkin, H. A., Oltman, P. K., Raskin, E., & Karp, S. A. (1971). A manual for the Embedded Figures Test. Palo Alto, CA: Consulting Psychologists Press.Bard, C. (1972). The relation between perceptual style and physical attractiveness. International Journal of Sports Psychology, 3, 107-113.

Wright, B.D., & Stone, M.H. (1979). Best test design. Chicago: MESA Press.

Table 1. ITEM CHARACTERISTIC CURVE
(Part A: n=791-3-22=766)

SEQ NUM	ITEM NAME	1ST GROUP	2ND GROUP	3RD GROUP	4TH GROUP	5TH GROUP	6TH GROUP
1	A001	0.84	0.94	0.95	0.95	0.96	1.00
2	A002	0.53	0.78	0.72	0.90	0.90	0.94
3	A*03	0.71	0.82	0.88	0.93	0.96	0.98
4	A004	0.53	0.62	0.67	0.75	0.84	0.92
5	A005	0.21	0.30	0.25	0.40	0.43	0.69
6	A*06	0.28	0.42	0.56	0.66	0.72	0.84
7	A*07	0.14	0.13	0.16	0.17	0.20	0.35
8	A*08	0.34	0.57	0.62	0.71	0.77	0.92
9	A009	0.18	0.20	0.29	0.25	0.40	0.54
10	A*10	0.22	0.27	0.26	0.31	0.33	0.44
11	A011	0.22	0.31	0.41	0.50	0.59	0.70
12	A*12	0.41	0.58	0.68	0.84	0.84	0.96
13	A013	0.26	0.40	0.45	0.62	0.64	0.80
14	A*14	0.60	0.79	0.83	0.84	0.88	0.92
15	A*15	0.14	0.22	0.25	0.37	0.44	0.67
16	A*16	0.45	0.60	0.80	0.76	0.84	0.92
17	A017	0.27	0.41	0.51	0.50	0.69	0.74
18	A018	0.71	0.90	0.93	0.97	0.97	0.97
19	A*19	0.69	0.77	0.83	0.92	0.93	0.96
20	A*20	0.25	0.23	0.46	0.39	0.60	0.70
21	A*21	0.69	0.81	0.90	0.92	0.97	0.98
22	A*22	0.70	0.82	0.88	0.90	0.91	0.98
23	A023	0.78	0.92	0.97	0.97	0.97	1.00
24	A*24	0.43	0.51	0.52	0.66	0.72	0.86
25	A025	0.51	0.70	0.83	0.78	0.92	0.96
26	A026	0.38	0.61	0.68	0.76	0.72	0.87
27	A027	0.51	0.61	0.85	0.91	0.91	0.93
28	A028	0.50	0.72	0.86	0.84	0.94	0.97
29	A*29	0.33	0.66	0.58	0.76	0.78	0.91
30	A030	0.41	0.49	0.57	0.61	0.63	0.74
31	A031	0.32	0.49	0.54	0.61	0.75	0.87
32	A032	0.38	0.53	0.69	0.71	0.85	0.92
33	A033	0.39	0.57	0.65	0.77	0.78	0.94
34	A034	0.29	0.58	0.68	0.66	0.78	0.90
35	A035	0.66	0.78	0.83	0.88	0.87	0.95
SCORE RANGE		1-18	19-21	22-23	24-25	26-27	28-34
MEAN ABILITY		-0.34	0.35	0.72	1.02	1.36	2.13
MEAN Z-TEST		0.1	0.1	0.1	0.2	0.2	0.4
SD(Z-TEST)		1.6	1.1	1.0	0.9	0.9	1.3
GROUP COUNT		116	125	112	119	116	178

Note. Asterisks designate the 15 linking items.

Table 2
ITEM CHARACTERISTIC CURVE: Part A
(n=225-3-8=214 college students)

SEQ NUM	ITEM NAME	1ST GROUP	2ND GROUP	3RD GROUP	4TH GROUP	5TH GROUP	6TH GROUP
1	A001	0.31	0.39	0.58	0.75	0.81	0.87
2	A002	0.44	0.53	0.52	0.66	0.85	0.96
3	A003*	0.72	0.89	0.91	1.00	0.96	1.00
4	A004	0.41	0.69	0.76	0.91	0.81	0.96
5	A005	0.25	0.22	0.39	0.44	0.42	0.65
6	A006*	0.47	0.67	0.70	0.81	0.77	0.93
7	A007*	0.13	0.28	0.24	0.38	0.38	0.65
8	A008*	0.41	0.64	0.70	0.81	0.96	0.91
9	A009	0.19	0.36	0.24	0.22	0.35	0.62
10	A010*	0.38	0.36	0.70	0.69	0.73	0.89
11	A011	0.34	0.67	0.67	0.75	0.92	0.93
12	A012*	0.25	0.53	0.64	0.72	0.88	0.91
13	A013	0.34	0.42	0.58	0.72	0.92	0.93
14	A014*	0.69	0.83	0.76	0.84	0.85	0.85
15	A015*	0.13	0.22	0.33	0.41	0.42	0.60
16	A016*	0.47	0.69	0.88	0.97	0.88	0.91
17	A017	0.50	0.53	0.58	0.69	0.81	0.84
18	A018	0.56	0.89	0.94	1.00	1.00	1.00
19	A019*	0.50	0.81	0.79	0.88	0.96	1.00
20	A020*	0.22	0.50	0.61	0.75	0.69	0.89
21	A021*	0.72	0.81	0.85	0.84	1.00	0.98
22	A022*	0.88	0.94	0.97	0.91	1.00	0.98
23	A023	0.69	0.78	0.91	0.97	0.96	0.98
24	A024*	0.53	0.75	0.64	0.81	0.77	0.91
25	A025	0.44	0.86	0.94	0.78	0.85	0.96
26	A026	0.22	0.50	0.64	0.84	0.77	0.91
27	A027	0.69	0.81	0.91	0.91	0.88	0.98
28	A028	0.50	0.75	0.67	0.88	0.92	0.89
29	A029*	0.44	0.58	0.82	0.75	0.92	0.96
30	A030	0.22	0.58	0.42	0.41	0.58	0.64
31	A031	0.59	0.64	0.76	0.84	0.88	0.95
32	A032	0.59	0.69	0.85	0.72	0.92	0.95
33	A033	0.50	0.72	0.79	0.72	0.77	0.87
34	A034	0.72	0.75	0.91	0.84	0.92	0.96
35	A035	0.72	0.89	0.88	1.00	0.88	0.89
SCORE RANGE		1-20	21-23	24-25	26-27	28-29	30-34
MEAN ABILITY		-0.20	0.62	0.95	1.32	1.67	2.41
MEAN Z-TEST		0.0	0.1	0.1	0.1	0.1	0.2
SD(Z-TEST)		1.0	1.1	0.8	1.0	0.9	1.1
GROUP COUNT		32	36	33	32	26	55

Note. Asterisks designate the 15 linking items.

Table 3. ITEM CHARACTERISTIC CURVE
(Part B: n=797-24=773)

SEQ NUM	ITEM NAME	1ST GROUP	2ND GROUP	3RD GROUP	4TH GROUP	5TH GROUP
1	B*01	0.59	0.78	0.81	0.90	0.97
2	B002	0.11	0.15	0.17	0.26	0.48
3	B003	0.07	0.14	0.14	0.15	0.18
4	B004	0.18	0.32	0.41	0.55	0.75
5	B*05	0.17	0.29	0.46	0.62	0.81
6	B*06	0.13	0.11	0.17	0.13	0.27
7	B007	0.10	0.17	0.17	0.35	0.54
8	B008	0.26	0.41	0.50	0.61	0.75
9	B*09	0.34	0.53	0.62	0.75	0.90
10	B010	0.22	0.31	0.34	0.47	0.72
11	B*11	0.27	0.38	0.49	0.63	0.81
12	B012	0.28	0.44	0.46	0.60	0.61
13	B013	0.20	0.16	0.17	0.20	0.34
14	B*14	0.25	0.44	0.59	0.63	0.78
15	B*15	0.54	0.71	0.83	0.78	0.86
16	B016	0.27	0.42	0.53	0.65	0.78
17	B*17	0.07	0.09	0.17	0.25	0.45
18	B*18	0.41	0.56	0.66	0.80	0.89
19	B019	0.74	0.92	0.95	0.99	1.00
20	B020	0.18	0.32	0.63	0.65	0.88
21	B*21	0.56	0.80	0.83	0.86	0.91
22	B*22	0.18	0.27	0.41	0.53	0.76
23	B023	0.40	0.51	0.54	0.73	0.80
24	B024	0.16	0.33	0.42	0.45	0.67
25	B025	0.20	0.24	0.36	0.44	0.71
26	B*26	0.43	0.70	0.75	0.88	0.95
27	B027	0.64	0.80	0.93	0.91	0.97
28	B*28	0.49	0.78	0.79	0.87	0.94
29	B*29	0.24	0.39	0.50	0.63	0.76
30	B030	0.29	0.35	0.37	0.42	0.54
31	B031	0.38	0.54	0.61	0.70	0.88
32	B*32	0.28	0.50	0.67	0.73	0.88
33	B033	0.25	0.34	0.49	0.60	0.80
34	B034	0.53	0.71	0.73	0.80	0.94
35	B035	0.28	0.29	0.40	0.50	0.66
SCORE RANGE		1-13	14-16	17-19	20-22	23-34
MEAN ABILITY		-1.01	-0.32	0.08	0.49	1.31
MEAN Z-TEST		0.1	0.0	0.1	0.1	0.3
SD(Z-TEST)		2.0	1.2	1.0	0.9	1.7
GROUP COUNT		138	143	145	161	186

Note. Asterisks designate the 15 linking items.

Table 4
ITEM CHARACTERISTIC CURVE: Part B
(n=232-2-4=226 college students)

SEQ NUM	ITEM NAME	1ST GROUP	2ND GROUP	3RD GROUP	4TH GROUP	5TH GROUP	6TH GROUP
1	B001*	0.78	0.82	0.93	1.00	1.00	1.00
2	B002	0.11	0.30	0.35	0.37	0.39	0.64
3	B003	0.06	0.03	0.17	0.13	0.17	0.64
4	B004	0.44	0.57	0.57	0.58	0.64	0.78
5	B005*	0.42	0.73	0.80	0.82	0.89	0.89
6	B006*	0.14	0.17	0.30	0.39	0.50	0.64
7	B007	0.06	0.43	0.52	0.55	0.64	0.83
8	B008	0.44	0.55	0.70	0.58	0.92	0.92
9	B009*	0.61	0.82	0.73	0.84	0.94	0.94
10	B010	0.22	0.43	0.47	0.82	0.78	0.92
11	B011*	0.42	0.45	0.60	0.71	0.86	0.97
12	B012	0.50	0.50	0.65	0.71	0.81	0.97
13	B013	0.17	0.13	0.15	0.24	0.28	0.72
14	B014*	0.36	0.60	0.65	0.74	0.75	0.92
15	B015*	0.78	0.77	0.82	0.89	0.94	0.94
16	B016	0.39	0.40	0.57	0.71	0.78	0.94
17	B017*	0.14	0.25	0.35	0.32	0.50	0.69
18	B018*	0.47	0.85	0.93	0.92	0.97	0.97
19	B019	0.78	0.95	0.98	1.00	1.00	1.00
20	B020	0.42	0.63	0.77	0.79	1.00	1.00
21	B021*	0.75	0.82	0.90	0.92	0.92	0.97
22	B022*	0.28	0.57	0.75	0.87	0.94	0.94
23	B023	0.47	0.68	0.70	0.68	0.72	0.89
24	B024	0.17	0.38	0.50	0.71	0.67	0.89
25	B025	0.25	0.40	0.65	0.82	0.92	1.00
26	B026*	0.47	0.82	0.93	0.87	0.97	1.00
27	B027	0.61	0.90	0.90	0.92	0.94	0.97
28	B028*	0.61	0.82	0.88	0.95	0.97	0.97
29	B029*	0.53	0.70	0.70	0.84	0.86	0.94
30	B030	0.33	0.35	0.45	0.53	0.56	0.92
31	B031	0.56	0.65	0.77	0.87	0.97	1.00
32	B032*	0.47	0.55	0.75	0.84	0.86	0.94
33	B033	0.44	0.47	0.63	0.84	0.89	0.97
34	B034	0.75	0.90	0.90	0.97	1.00	0.97
35	B035	0.39	0.47	0.55	0.55	0.83	0.92
SCORE RANGE		1-18	19-21	22-24	25-26	27-29	30-34
MEAN ABILITY		-0.42	0.31	0.77	1.32	1.63	2.75
MEAN Z-TEST		0.0	0.0	0.1	0.1	0.2	0.1
SD(Z-TEST)		1.2	0.9	0.7	0.9	1.0	1.0
GROUP COUNT		36	40	40	38	36	36

Note. Asterisks designate the 15 linking items.

Table 5. ITEM CHARACTERISTIC CURVE
(Parts A&B: n=60-6=54)

SEQ NUM	ITEM NAME	1ST GROUP	2ND GROUP	3RD GROUP	4TH GROUP	5TH GROUP	6TH GROUP
2	A002	0.50	0.89	0.89	0.89	1.00	0.90
3	A*03	0.75	1.00	0.89	0.78	1.00	1.00
4	A004	0.50	0.67	0.44	0.44	0.89	0.70
5	A005	0.25	0.33	0.33	0.11	0.44	0.60
6	A*06	0.13	0.33	0.44	0.78	0.67	0.70
7	A*07	0.25	0.11	0.00	0.11	0.11	0.50
8	A*08	0.13	0.56	0.56	0.67	0.56	0.70
9	A009	0.25	0.56	0.11	0.33	0.33	0.50
10	A*10	0.25	0.33	0.44	0.22	0.22	0.20
11	A011	0.25	0.11	0.22	0.11	0.33	0.70
12	A*12	0.25	0.56	0.56	1.00	0.78	1.00
13	A013	0.13	0.44	0.11	0.22	0.67	0.60
14	A*14	0.88	0.56	1.00	0.78	0.78	0.90
15	A*15	0.00	0.22	0.11	0.33	0.22	0.70
16	A*16	0.63	1.00	0.78	0.78	0.89	1.00
17	A017	0.13	0.56	0.22	0.56	0.33	0.60
18	A018	0.63	1.00	1.00	1.00	1.00	1.00
19	A*19	0.88	0.67	0.67	0.89	0.78	0.90
20	A*20	0.00	0.22	0.33	0.56	0.67	0.40
21	A*21	0.75	0.67	0.89	1.00	0.78	1.00
22	A*22	0.75	0.67	1.00	1.00	1.00	1.00
23	A023	0.75	1.00	1.00	1.00	0.89	1.00
24	A*24	0.25	0.33	0.44	0.78	0.67	1.00
25	A025	0.25	0.56	0.67	0.78	0.78	1.00
26	A026	0.38	0.44	0.78	0.78	0.89	0.90
27	A027	0.63	0.78	0.89	0.78	1.00	0.90
28	A028	0.88	0.56	0.67	0.78	1.00	0.90
29	A*29	0.38	0.78	0.78	0.89	0.44	0.90
30	A030	0.50	0.56	0.22	0.33	0.78	0.90
31	A031	0.00	0.44	0.56	0.67	0.67	1.00
32	A032	0.13	0.56	0.67	0.67	0.67	1.00
33	A033	0.50	0.78	0.89	0.78	0.89	1.00
34	A034	0.25	0.44	0.78	0.67	0.78	1.00
35	A035	0.75	0.89	0.89	1.00	1.00	1.00
36	B*01	0.75	0.89	1.00	1.00	1.00	1.00
37	B002	0.25	0.00	0.00	0.33	0.22	0.50
38	B003	0.13	0.22	0.00	0.22	0.00	0.40
39	B004	0.38	0.00	0.33	0.33	0.33	0.50
40	B*05	0.13	0.33	0.67	0.78	0.89	0.90
41	B*06	0.25	0.11	0.11	0.22	0.22	0.40
42	B007	0.00	0.00	0.33	0.11	0.56	0.50
43	B008	0.25	0.22	0.44	0.56	0.44	0.90
44	B*09	0.38	0.56	0.44	0.56	0.67	0.70
45	B010	0.13	0.22	0.56	0.56	0.22	0.50

Table 5 (continued)

SEQ NUM	ITEM NAME	1ST GROUP	2ND GROUP	3RD GROUP	4TH GROUP	5TH GROUP	6TH GROUP
46	B*11	0.38	0.33	0.56	0.67	0.78	0.70
47	B012	0.25	0.44	0.67	0.67	0.56	0.90
48	B013	0.38	0.00	0.11	0.22	0.11	0.50
49	B*14	0.38	0.56	0.67	0.56	0.67	0.70
50	B*15	0.75	0.44	0.89	0.67	0.89	0.90
51	B016	0.25	0.33	0.11	0.56	0.67	0.80
52	B*17	0.00	0.00	0.22	0.22	0.22	0.80
53	B*18	0.38	0.67	0.78	1.00	0.89	1.00
54	B019	0.75	0.78	1.00	0.78	1.00	1.00
55	B020	0.13	0.56	0.44	0.78	0.78	0.90
56	B*21	0.75	0.67	0.89	0.78	0.89	0.80
57	B*22	0.13	0.56	0.33	0.22	0.78	0.50
58	B023	0.63	0.56	0.44	0.67	0.67	0.90
59	B024	0.38	0.11	0.22	0.56	0.67	0.70
60	B025	0.25	0.44	0.33	0.22	0.22	0.60
61	B*26	0.75	0.67	0.56	0.89	0.78	1.00
62	B027	0.63	0.56	0.44	0.89	1.00	1.00
63	B*28	0.50	0.56	0.44	0.78	1.00	1.00
64	B*29	0.25	0.22	0.33	0.44	0.56	1.00
65	B030	0.13	0.11	0.22	0.22	0.67	0.40
66	B031	0.25	0.33	0.44	0.56	0.67	0.80
67	B*32	0.25	0.56	0.44	0.78	0.44	0.90
68	B033	0.25	0.22	0.33	0.22	0.67	0.70
69	B034	0.50	0.33	0.67	0.56	0.89	1.00
70	B035	0.13	0.33	0.11	0.33	0.33	0.70
SCORE RANGE		1-31	32-34	35-38	39-42	43-46	47-68
MEAN ABILITY		-0.65	-0.13	0.12	0.55	0.86	1.72
MEAN Z-TEST		0.0	0.0	0.0	0.0	0.0	0.1
SD(Z-TEST)		1.1	1.0	0.9	0.8	0.9	0.9
GROUP COUNT		8	9	9	9	9	10

Note. Asterisks designate the 15 linking items.

Table 6
FIT ORDER (Part A: n=791-3-22=766)

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT t-TESTS BETWN	TOTAL	WTD MNSQ	MNSQ SD	DISC INDX	POINT BISER
32	A032	0.03	0.00	0.99	-1.94	0.93	0.04	1.22	0.42
12	A*12	-0.19	0.00	1.82	-1.79	0.93	0.04	1.29	0.42
28	A028	-0.70	0.00	1.95	-1.53	0.91	0.06	1.33	0.41
15	A*15	1.55	0.00	-0.41	-1.52	0.95	0.03	1.13	0.40
8	A*08	0.14	0.00	0.09	-1.44	0.95	0.03	1.17	0.40
33	A033	-0.01	0.00	0.97	-1.26	0.95	0.04	1.22	0.40
34	A034	0.18	0.00	1.22	-1.26	0.96	0.03	1.19	0.39
6	A*06	0.49	0.00	-0.77	-1.24	0.97	0.03	1.12	0.40
27	A027	-0.55	0.00	2.60	-1.20	0.94	0.05	1.21	0.39
29	A*29	0.08	0.00	1.84	-1.17	0.96	0.03	1.15	0.39
25	A025	-0.56	0.00	1.20	-0.98	0.95	0.05	1.18	0.38
31	A031	0.43	0.00	-0.55	-0.92	0.97	0.03	1.09	0.39
16	A*16	-0.22	0.00	0.44	-0.87	0.96	0.04	1.10	0.37
18	A018	-1.62	0.00	0.99	-0.73	0.93	0.10	1.22	0.32
21	A*21	-1.28	0.00	0.36	-0.68	0.94	0.08	1.20	0.33
2	A002	-0.64	0.00	1.36	-0.66	0.96	0.06	1.08	0.35
23	A023	-2.05	0.00	1.10	-0.63	0.92	0.13	1.36	0.31
19	A*19	-1.03	0.00	-0.27	-0.39	0.97	0.07	1.03	0.31
22	A*22	-1.14	0.00	-0.99	-0.31	0.97	0.08	1.03	0.29
13	A013	0.74	0.00	-0.67	-0.23	0.99	0.03	1.05	0.37
3	A*03	-1.31	0.00	-0.33	-0.22	0.98	0.08	1.17	0.29
1	A001	-2.12	0.00	0.09	-0.04	0.99	0.13	1.08	0.21
26	A026	0.09	0.00	0.10	0.06	1.00	0.03	0.95	0.34
35	A035	-0.86	0.00	-0.91	0.13	1.01	0.06	0.90	0.27
4	A004	-0.19	0.00	0.02	0.24	1.01	0.04	0.95	0.32
20	A*20	1.15	0.00	1.95	0.26	1.01	0.03	0.94	0.35
14	A*14	-0.72	0.01	-0.41	0.38	1.02	0.06	0.86	0.26
5	A005	1.40	0.01	1.36	0.50	1.01	0.03	0.94	0.33
17	A017	0.81	0.01	0.40	0.84	1.02	0.03	0.87	0.34
11	A011	1.08	0.01	-1.41	0.86	1.02	0.03	0.95	0.34
24	A*24	0.34	0.02	0.76	1.01	1.03	0.03	0.89	0.31
9	A009	1.77	0.02	1.43	1.40	1.05	0.04	0.79	0.29
7	A*07	2.50	0.04	2.86	1.64	1.09	0.05	0.65	0.19
30	A030	0.57	0.05	2.75	3.90	1.11	0.03	0.56	0.23
10	A*10	1.84	0.08	4.77	4.17	1.16	0.04	0.40	0.17
Mean				0.76	-0.16	0.99	0.05		
SD				1.31	1.39	0.05	0.03		

Table 7
FIT ORDER: Part A
(n=225-3-8=214 college students)

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	t-TESTS TOTAL	WTD MNSQ	MNSQ SD	DISC INDX	POINT BISER
26	A026	0.43	0.00	0.64	-1.97	0.88	0.06	1.34	0.51
13	A013	0.43	0.00	0.93	-1.72	0.89	0.06	1.32	0.49
12	A012*	0.41	0.00	-0.11	-1.41	0.91	0.07	1.31	0.46
20	A020*	0.60	0.00	-0.34	-1.09	0.94	0.06	1.22	0.45
29	A029*	-0.09	0.00	0.36	-0.98	0.92	0.09	1.25	0.45
18	A018	-1.29	0.00	1.72	-0.84	0.85	0.18	1.64	0.47
2	A002	0.36	0.00	1.06	-0.79	0.95	0.07	1.17	0.42
19	A019*	-0.61	0.00	0.43	-0.77	0.91	0.12	1.37	0.43
4	A004	-0.18	0.00	0.09	-0.77	0.93	0.09	1.24	0.42
25	A025	-0.50	0.00	1.65	-0.71	0.92	0.11	1.14	0.40
1	A001	0.60	0.00	-0.28	-0.65	0.96	0.06	1.17	0.40
11	A011	0.11	0.00	-0.32	-0.53	0.96	0.08	1.21	0.40
16	A016*	-0.40	0.00	0.81	-0.45	0.95	0.10	1.09	0.37
23	A023	-1.08	0.00	-0.45	-0.42	0.93	0.16	1.19	0.36
3	A003*	-1.48	0.00	-0.17	-0.30	0.93	0.20	1.32	0.34
10	A010*	0.55	0.00	0.44	-0.18	0.99	0.06	1.07	0.37
8	A008*	0.00	0.00	-0.39	-0.15	0.99	0.08	1.14	0.36
21	A021*	-0.94	0.00	0.03	-0.11	0.98	0.14	1.02	0.31
31	A031	-0.27	0.00	-1.10	-0.08	0.99	0.10	0.97	0.35
28	A028	-0.18	0.00	0.06	-0.08	0.99	0.09	0.91	0.34
27	A027	-0.94	0.00	-1.02	-0.03	0.99	0.14	1.01	0.29
32	A032	-0.33	0.00	0.33	0.07	1.00	0.10	0.92	0.32
34	A034	-0.81	0.00	-0.42	0.08	1.00	0.13	0.88	0.28
22	A022*	-1.96	0.00	0.09	0.09	1.00	0.26	0.84	0.16
6	A006*	0.02	0.00	-1.38	0.11	1.01	0.08	0.96	0.34
7	A007*	1.84	0.00	-1.23	0.18	1.01	0.06	1.00	0.35
35	A035	-0.98	0.03	2.26	0.44	1.06	0.15	0.58	0.18
24	A024*	-0.03	0.02	0.13	0.58	1.05	0.08	0.78	0.29
33	A033	0.02	0.02	0.17	0.64	1.05	0.08	0.69	0.29
17	A017	0.43	0.03	0.04	0.91	1.06	0.06	0.71	0.30
14	A014*	-0.40	0.05	1.86	0.93	1.10	0.10	0.40	0.18
9	A009	1.90	0.03	1.51	0.96	1.06	0.06	0.74	0.27
15	A015*	1.84	0.03	-1.84	1.13	1.07	0.06	0.91	0.32
5	A005	1.61	0.04	0.17	1.32	1.07	0.06	0.77	0.27
30	A030	1.28	0.06	2.29	2.41	1.13	0.05	0.51	0.26
	MEAN			0.23	-0.12	0.98	0.10		
	S.D.			1.00	0.89	0.07	0.05		

Table 8
FIT ORDER (Part B: n=797-24=773)

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	t-TESTS TOTAL	WTD MNSQ	MNSQ SD	DISC INDX	POINT BISER
20	B020	-0.07	0.00	4.35	-4.97	0.88	0.03	1.49	0.50
5	B*05	0.21	0.00	2.53	-4.03	0.90	0.02	1.39	0.48
22	B*22	0.39	0.00	1.03	-2.13	0.95	0.03	1.24	0.42
4	B004	0.35	0.00	-0.22	-2.09	0.95	0.03	1.17	0.42
32	B*32	-0.42	0.00	1.40	-2.07	0.94	0.03	1.27	0.42
26	B*26	-1.10	0.00	2.09	-1.80	0.92	0.05	1.34	0.42
9	B*09	-0.49	0.00	0.60	-1.50	0.95	0.03	1.22	0.41
11	B*11	0.03	0.00	-0.44	-1.27	0.97	0.03	1.12	0.40
33	B033	0.11	0.00	0.16	-1.25	0.97	0.02	1.14	0.40
7	B007	1.24	0.00	0.71	-0.96	0.96	0.04	1.11	0.38
28	B*28	-1.26	0.00	1.00	-0.95	0.95	0.05	1.16	0.35
18	B*18	-0.65	0.00	-0.38	-0.89	0.97	0.03	1.12	0.37
27	B027	-1.80	0.00	1.31	-0.84	0.94	0.07	1.23	0.34
25	B025	0.60	0.00	0.61	-0.80	0.98	0.03	1.10	0.38
29	B*29	0.09	0.00	-1.50	-0.64	0.98	0.02	1.05	0.38
19	B019	-2.55	0.00	2.74	-0.64	0.93	0.11	1.55	0.33
14	B*14	-0.07	0.00	-0.12	-0.53	0.99	0.03	1.05	0.37
1	B*01	-1.50	0.00	0.82	-0.47	0.97	0.06	1.22	0.33
31	B031	-0.45	0.00	-0.50	-0.45	0.99	0.03	1.05	0.37
10	B010	0.49	0.00	0.39	-0.38	0.99	0.03	1.01	0.37
16	B016	-0.03	0.00	-2.02	-0.33	0.99	0.03	1.05	0.37
21	B*21	-1.37	0.00	0.30	-0.22	0.99	0.05	0.98	0.29
17	B*17	1.59	0.00	-0.43	-0.16	0.99	0.05	1.12	0.33
34	B034	-1.06	0.00	0.09	-0.13	0.99	0.04	1.02	0.33
2	B002	1.43	0.00	-0.08	-0.02	1.00	0.05	1.01	0.32
24	B024	0.54	0.00	-0.20	0.05	1.00	0.03	0.98	0.36
8	B008	0.08	0.00	-2.29	0.32	1.01	0.02	0.96	0.35
23	B023	-0.32	0.01	0.95	0.86	1.02	0.03	0.86	0.32
6	B*06	1.97	0.04	4.18	1.18	1.08	0.06	0.51	0.17
15	B*15	-1.05	0.03	2.12	1.44	1.06	0.04	0.76	0.23
13	B013	1.58	0.05	5.48	1.97	1.10	0.05	0.42	0.17
35	B035	0.45	0.03	1.12	2.01	1.05	0.03	0.80	0.30
3	B003	2.19	0.08	4.07	2.12	1.16	0.07	0.42	0.10
12	B012	0.24	0.05	3.30	3.94	1.10	0.02	0.59	0.24
30	B030	0.63	0.07	4.29	4.66	1.14	0.03	0.44	0.20
Mean				1.07	-0.31	0.99	0.04		
SD				1.86	1.87	0.06	0.02		

Table 9
FIT ORDER: Part B
(n=232-2-4=226 college students)

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	t-TESTS TOTAL	WTD MNSQ	MNSQ SD	DISC INDX	POINT BISER
25	B025	0.17	0.00	1.86	-2.70	0.84	0.06	1.54	0.55
22	B022*	-0.14	0.00	1.07	-1.77	0.87	0.07	1.38	0.50
10	B010	0.51	0.00	0.76	-1.74	0.91	0.05	1.24	0.49
20	B020	-0.38	0.00	1.06	-1.16	0.90	0.08	1.36	0.46
33	B033	-0.02	0.00	0.42	-1.15	0.92	0.07	1.18	0.46
24	B024	0.76	0.00	-0.26	-1.04	0.95	0.05	1.16	0.46
26	B026*	-0.95	0.00	1.12	-0.87	0.90	0.12	1.37	0.43
18	B018*	-1.02	0.00	1.08	-0.86	0.89	0.12	1.33	0.41
11	B011*	0.19	0.00	-0.16	-0.65	0.96	0.06	1.12	0.42
3	B003	2.68	0.00	0.92	-0.59	0.93	0.11	1.22	0.40
7	B007	0.97	0.00	0.90	-0.57	0.97	0.05	1.11	0.46
31	B031	-0.61	0.00	0.04	-0.47	0.95	0.10	1.22	0.39
32	B032*	-0.19	0.00	-1.22	-0.37	0.97	0.08	1.03	0.39
27	B027	-1.23	0.00	-0.58	-0.22	0.96	0.14	1.07	0.31
19	B019	-2.29	0.00	0.24	-0.19	0.93	0.26	1.47	0.32
28	B028*	-1.14	0.00	-1.03	-0.19	0.97	0.13	1.16	0.33
5	B005*	-0.32	0.00	0.24	-0.15	0.99	0.08	0.91	0.36
34	B034	-1.68	0.00	-0.48	-0.14	0.96	0.19	1.08	0.29
14	B014*	0.17	0.00	-1.31	-0.09	0.99	0.06	0.89	0.39
1	B001*	-1.74	0.00	0.36	-0.06	0.98	0.19	1.28	0.30
16	B016	0.37	0.00	-0.61	0.04	1.00	0.06	1.04	0.39
21	B021*	-1.27	0.01	-1.43	0.19	1.02	0.15	0.83	0.24
9	B009*	-0.71	0.01	0.29	0.21	1.02	0.10	0.84	0.29
13	B013	2.15	0.01	1.07	0.28	1.02	0.08	1.00	0.33
8	B008	0.10	0.01	1.12	0.39	1.02	0.06	0.90	0.35
15	B015*	-1.06	0.03	0.15	0.44	1.05	0.13	0.70	0.21
30	B030	0.91	0.01	0.68	0.46	1.02	0.05	0.87	0.39
12	B012	0.08	0.02	-0.09	0.65	1.04	0.06	0.93	0.33
29	B029*	-0.35	0.03	-1.37	0.65	1.05	0.08	0.88	0.29
35	B035	0.44	0.02	0.17	0.70	1.04	0.06	0.92	0.35
6	B006*	1.71	0.03	-0.94	0.85	1.06	0.07	0.85	0.37
17	B017*	1.62	0.03	-0.92	1.05	1.07	0.06	0.84	0.35
2	B002	1.69	0.06	0.57	1.75	1.12	0.07	0.69	0.31
23	B023	0.05	0.06	0.98	1.79	1.12	0.07	0.59	0.24
4	B004	0.53	0.10	2.39	3.52	1.20	0.05	0.33	0.20
	MEAN			0.20	-0.06	0.99	0.09		
	S.D.			0.94	1.12	0.08	0.05		

Table 10

FIT ORDER (Parts A&B: n=60-6=54)

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	t-TESTS TOTAL	WTD MNSQ	MNSQ SD	DISC INDX	POINT BISER
31	A031	0.11	0.00	0.56	-2.05	0.82	0.09	1.85	0.56
40	B*05	-0.15	0.00	0.34	-1.58	0.84	0.11	1.73	0.52
24	A*24	0.02	0.00	-0.15	-1.33	0.87	0.10	1.67	0.48
32	A032	-0.15	0.00	0.05	-1.29	0.87	0.11	1.59	0.50
64	B*29	0.53	0.00	-0.12	-1.27	0.88	0.09	1.61	0.48
52	B*17	1.62	0.00	0.54	-1.24	0.80	0.16	1.84	0.56
34	A034	-0.33	0.00	-0.18	-1.06	0.88	0.12	1.59	0.49
12	A*12	-0.52	0.00	0.58	-1.00	0.87	0.13	1.77	0.48
55	B020	-0.06	0.00	-0.30	-1.00	0.90	0.10	1.53	0.46
25	A025	-0.42	0.00	-0.69	-0.88	0.89	0.12	1.61	0.46
51	B016	0.61	0.00	-0.30	-0.79	0.92	0.10	1.27	0.44
15	A*15	1.52	0.00	-0.39	-0.71	0.89	0.15	1.43	0.47
26	A026	-0.52	0.00	-0.89	-0.66	0.91	0.13	1.32	0.40
43	B008	0.53	0.00	-0.78	-0.57	0.94	0.09	1.28	0.41
63	B*28	-0.62	0.00	0.36	-0.47	0.93	0.14	1.58	0.42
42	B007	1.62	0.00	0.83	-0.45	0.92	0.16	1.30	0.43
53	B*18	-1.06	0.00	-0.02	-0.44	0.90	0.19	1.77	0.43
6	A*06	0.36	0.00	-0.32	-0.33	0.97	0.09	1.12	0.38
59	B024	0.70	0.00	0.09	-0.32	0.97	0.10	1.02	0.38
2	A002	-1.47	0.00	-0.16	-0.31	0.90	0.26	1.18	0.35
47	B012	0.02	0.00	-0.92	-0.27	0.97	0.10	1.13	0.37
66	B031	0.36	0.00	-2.95	-0.26	0.97	0.09	1.12	0.38
67	B*32	0.11	0.00	0.05	-0.25	0.97	0.09	1.07	0.37
27	A027	-1.32	0.00	-0.67	-0.19	0.94	0.23	0.91	0.30
11	A011	1.42	0.00	-0.17	-0.16	0.97	0.15	1.09	0.32
7	A*07	2.10	0.00	0.91	-0.13	0.96	0.22	0.88	0.27
36	B*01	-2.59	0.00	-0.70	-0.12	0.86	0.51	1.88	0.38
33	A033	-1.18	0.00	-0.96	-0.09	0.97	0.21	1.33	0.31
35	A035	-2.27	0.00	-1.27	-0.07	0.91	0.42	1.65	0.32
22	A*22	-2.02	0.00	0.50	-0.03	0.95	0.36	1.72	0.32
23	A023	-2.59	0.00	0.21	0.01	0.92	0.51	1.26	0.26
54	B019	-1.81	0.00	0.12	0.01	0.97	0.32	1.20	0.25
69	B034	-0.33	0.00	0.25	0.01	1.00	0.12	1.40	0.35
18	A018	-2.59	0.00	0.68	0.02	0.93	0.51	2.21	0.31
70	B035	1.22	0.00	-0.84	0.04	1.00	0.13	1.10	0.33
16	A*16	-1.47	0.00	-0.06	0.04	0.99	0.26	1.01	0.25
3	A*03	-2.02	0.00	0.35	0.05	0.97	0.36	1.05	0.22
62	B027	-0.83	0.00	0.81	0.06	1.00	0.16	1.51	0.34
68	B033	0.87	0.00	-0.60	0.07	1.00	0.11	1.02	0.32
48	B013	1.85	0.01	1.92	0.13	1.01	0.19	0.63	0.24
13	A013	1.04	0.01	0.61	0.14	1.01	0.12	0.94	0.33
21	A*21	-1.47	0.01	0.17	0.14	1.01	0.26	1.04	0.24
29	A*29	-0.52	0.01	1.47	0.19	1.02	0.13	0.67	0.26
61	B*26	-0.94	0.02	-0.02	0.26	1.04	0.18	0.94	0.24

Table 10 (continued)

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	t-TESTS TOTAL	WTD MNSQ	MNSQ SD	DISC INDX	POINT BISER
37	B002	1.85	0.02	0.81	0.27	1.04	0.19	0.99	0.27
20	A*20	1.04	0.02	0.91	0.36	1.04	0.12	0.83	0.33
46	B*11	0.11	0.02	-0.84	0.39	1.03	0.09	0.77	0.28
38	B003	2.24	0.04	0.71	0.39	1.08	0.24	0.73	0.16
41	B*06	1.85	0.03	-0.22	0.41	1.07	0.19	0.57	0.16
65	B030	1.42	0.03	0.32	0.45	1.06	0.15	0.85	0.28
50	B*15	-0.83	0.04	0.49	0.52	1.08	0.16	0.69	0.18
8	A*08	0.28	0.02	-0.26	0.55	1.05	0.09	0.79	0.28
28	A028	-1.06	0.05	0.53	0.56	1.10	0.19	0.67	0.16
56	B*21	-1.06	0.05	0.33	0.60	1.11	0.19	0.24	0.07
17	A017	0.87	0.03	0.63	0.60	1.06	0.11	0.60	0.27
14	A*14	-1.18	0.06	1.04	0.65	1.13	0.21	0.28	0.06
58	B023	-0.24	0.04	-0.56	0.67	1.07	0.11	0.69	0.23
39	B004	1.32	0.04	0.96	0.69	1.09	0.14	0.51	0.21
5	A005	1.13	0.04	-0.12	0.71	1.08	0.12	0.61	0.22
19	A*19	-1.06	0.07	0.02	0.76	1.14	0.19	0.36	0.09
30	A030	0.19	0.04	1.02	0.81	1.07	0.09	0.93	0.24
4	A004	-0.06	0.05	0.81	0.93	1.09	0.10	0.39	0.21
45	B010	1.04	0.06	0.93	1.03	1.12	0.12	0.48	0.22
44	B*09	0.19	0.05	-1.09	1.07	1.10	0.09	0.52	0.21
49	B*14	0.02	0.05	-0.60	1.07	1.10	0.10	0.43	0.20
57	B*22	0.78	0.06	1.43	1.14	1.12	0.10	0.55	0.21
60	B025	1.13	0.08	0.49	1.25	1.16	0.12	0.39	0.14
9	A009	1.13	0.08	1.23	1.37	1.17	0.12	0.27	0.12
10	A*10	1.52	0.15	1.98	1.99	1.33	0.15	-0.36	-0.08
Mean				0.13	0.02	1.00	0.17		
SD				0.81	0.76	0.10	0.10		

Figure 1. COMPLETE SCORE EQUIVALENCE TABLE (Part A: n=791-3-22=766)

RAW SCORE	COUNT	LOG ABILITY	STANDARD ERRORS
34	4	3.99	1.04
33	2	3.24	0.76
32	23	2.77	0.64
31	24	2.42	0.57
30	33	2.13	0.52
29	48	1.89	0.49
28	44	1.67	0.46
27	49	1.47	0.44
26	67	1.28	0.43
25	57	1.11	0.42
24	62	0.94	0.41
23	60	0.79	0.40
22	52	0.63	0.39
21	42	0.49	0.39
20	48	0.34	0.38
19	35	0.20	0.38
18	29	0.06	0.38
17	26	-0.08	0.38
16	14	-0.22	0.38
15	12	-0.36	0.38
14	8	-0.51	0.39
13	7	-0.65	0.39
12	7	-0.80	0.40
11	3	-0.96	0.40
10	2	-1.12	0.41
9	5	-1.29	0.42
8	0	-1.47	0.44
7	1	-1.67	0.46
6	1	-1.88	0.48
5	1	-2.12	0.52
4	0	-2.41	0.56
3	0	-2.75	0.63
2	0	-3.21	0.75
1	0	-3.94	1.03

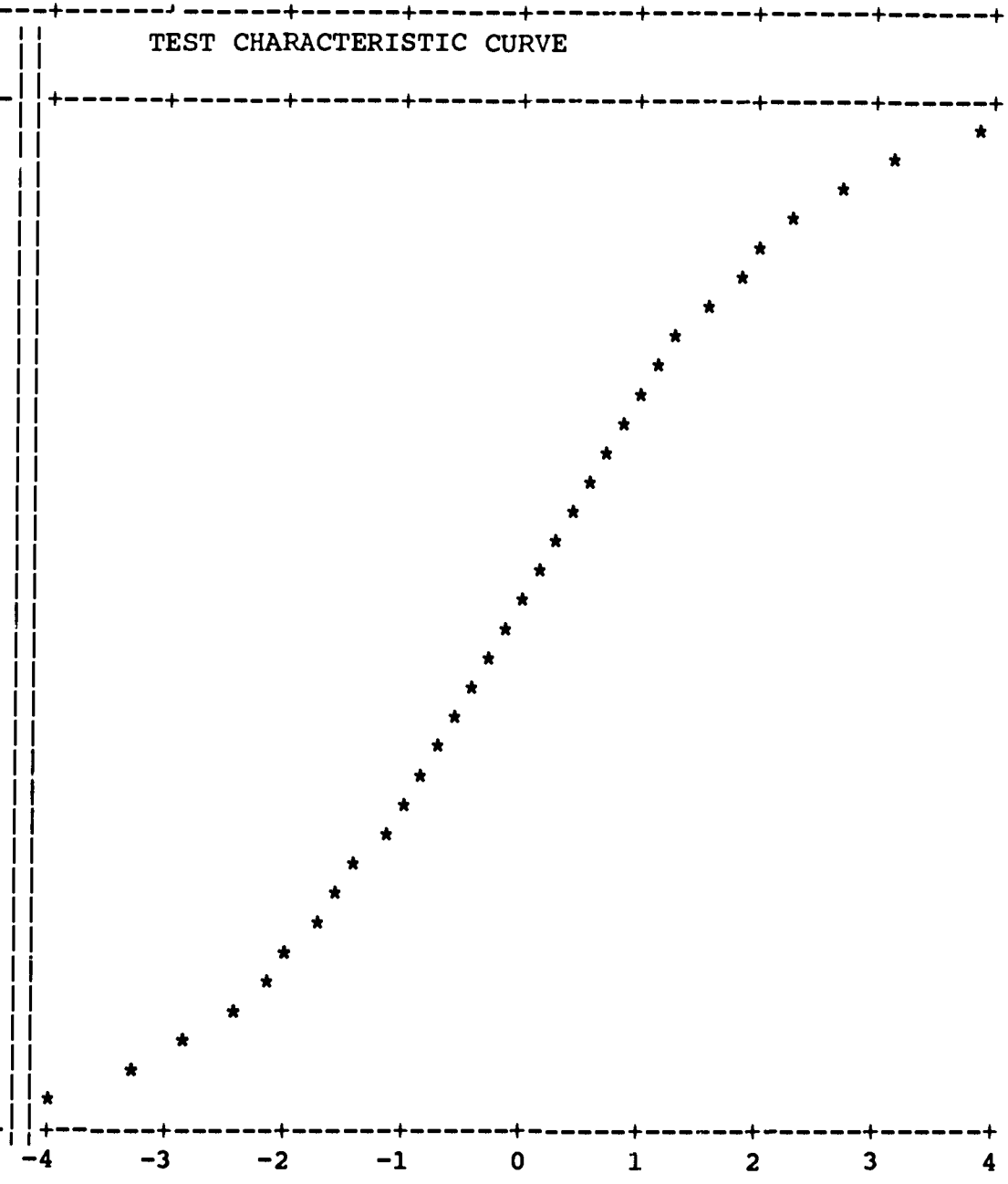

Figure 2. COMPLETE SCORE EQUIVALENCE TABLE (Part B: n=797-24=773)

RAW SCORE	COUNT	LOG ABILITY	STANDARD ERRORS
34	2	3.93	1.03
33	1	3.19	0.75
32	3	2.73	0.63
31	3	2.39	0.56
30	6	2.10	0.52
29	12	1.86	0.48
28	18	1.65	0.46
27	23	1.45	0.44
26	21	1.27	0.42
25	38	1.10	0.41
24	28	0.94	0.40
23	31	0.78	0.39
22	59	0.63	0.39
21	45	0.49	0.38
20	57	0.35	0.38
19	59	0.21	0.38
18	37	0.07	0.38
17	49	-0.07	0.38
16	63	-0.20	0.38
15	44	-0.34	0.38
14	36	-0.48	0.38
13	33	-0.63	0.39
12	28	-0.78	0.39
11	22	-0.93	0.40
10	23	-1.09	0.41
9	9	-1.26	0.43
8	10	-1.45	0.44
7	5	-1.64	0.46
6	2	-1.86	0.49
5	5	-2.11	0.52
4	1	-2.39	0.57
3	0	-2.74	0.64
2	0	-3.21	0.76
1	0	-3.95	1.04

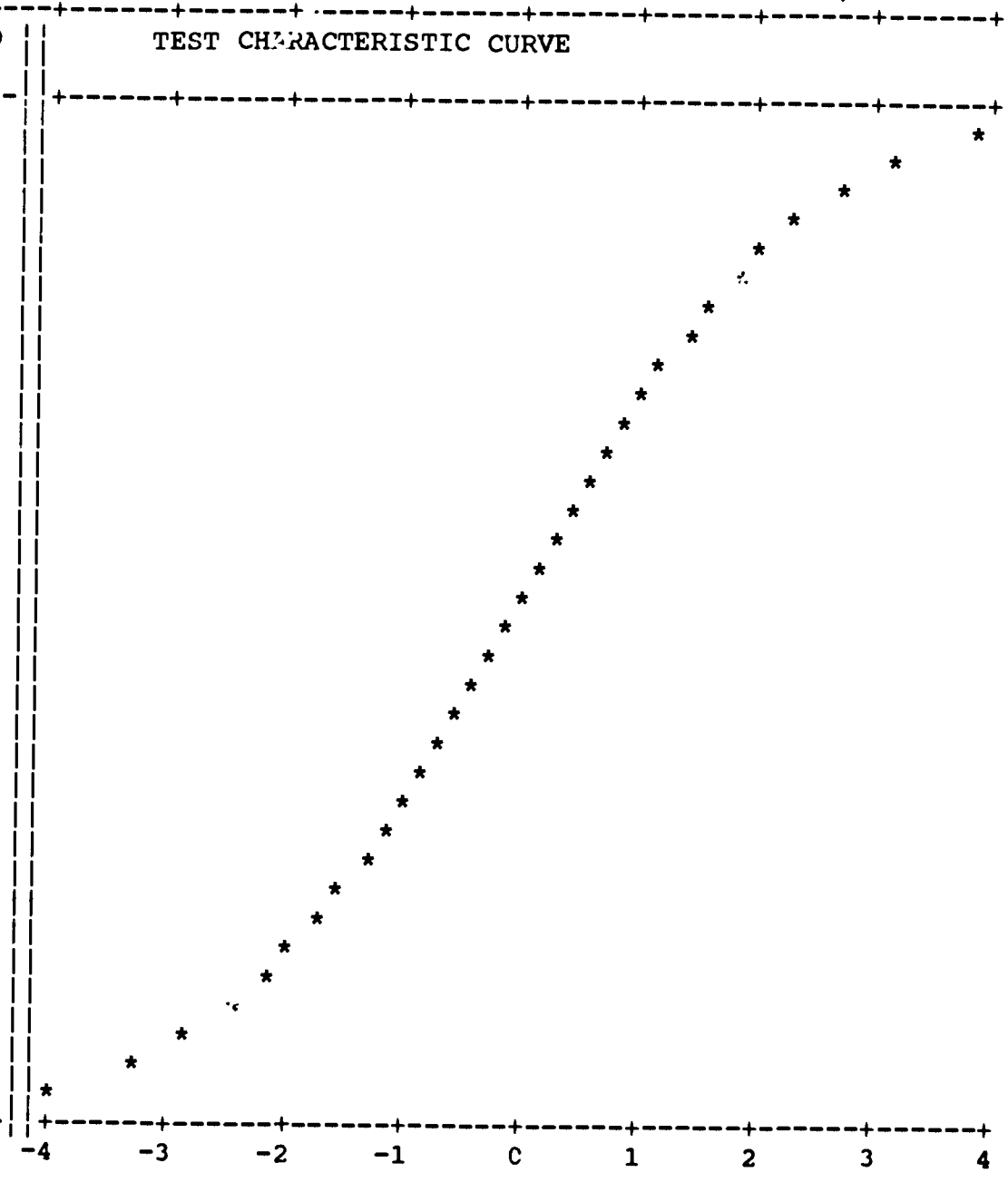

Figure 3. COMPLETE SCORE EQUIVALENCE TABLE (Parts A&B: n=60-6=54)

RAW SCORE	COUNT	LOG ABILITY	STANDARD ERRORS
68	0 + 0	4.78	1.01
66	0 + 0	3.63	0.60
64	0 + 0	3.07	0.48
62	0 + 0	2.67	0.42
60	0 + 0	2.35	0.38
58	1 + 1	2.09	0.35
56	3 + 2	1.85	0.34
54	0 + 0	1.64	0.32
52	1 + 1	1.45	0.31
50	1 + 0	1.26	0.30
48	0 + 0	1.09	0.29
46	4 + 3	0.92	0.29
44	2 + 0	0.76	0.28
42	5 + 3	0.60	0.28
40	0 + 1	0.45	0.28
38	1 + 1	0.29	0.28
36	2 + 5	0.14	0.28
34	1 + 2	-0.01	0.28
32	6 + 1	-0.16	0.28
30	1 + 1	-0.32	0.28
28	0 + 1	-0.47	0.28
26	0 + 1	-0.63	0.29
24	1 + 0	-0.80	0.29
22	0 + 1	-0.97	0.30
20	1 + 0	-1.15	0.30
18	0 + 0	-1.33	0.31
16	0 + 0	-1.53	0.32
14	0 + 0	-1.74	0.34
12	0 + 0	-1.98	0.35
10	0 + 0	-2.24	0.38
8	0 + 0	-2.55	0.41
6	0 + 0	-2.91	0.46
4	0 + 0	-3.40	0.54
2	0 + 0	-4.17	0.73

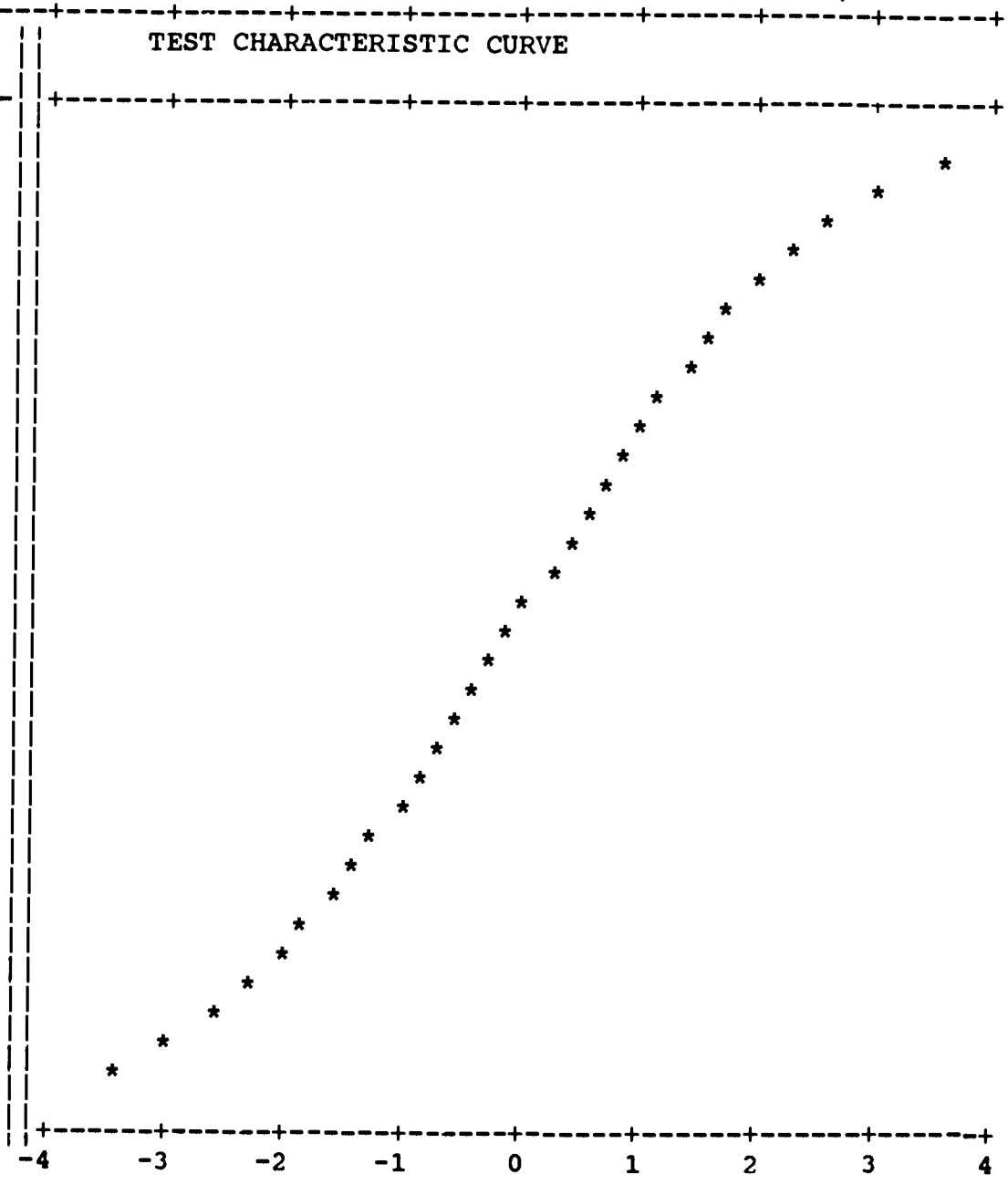

Figure 4
MAP OF VARIABLE (Part A: n=791-3-22=766)

	RAW SCORE	MEASURE MIDPOINT(S.E.)	ITEM COUNTS	TYPICAL ITEMS (BY NAME)
+4SD	34	3.90(1.04)		
		3.70(1.04)		
		3.50(1.04)		
+3SD	33	3.30(0.76)		
		3.10(0.76)		
		2.90(0.76)		
	32	2.70(0.64)		
+2SD	31	2.50(0.57)	1	A*07
		2.30(0.57)		
	30	2.10(0.52)		
	29	1.90(0.49)	1	A*10
+1SD	28	1.70(0.46)	1	A009
	27	1.50(0.44)	1	A*15
	26	1.30(0.43)	1	A005
	25	1.10(0.42)	2	A011 A*20
MEAN	24	0.90(0.41)	1	A017
	22	0.70(0.39)	1	A013
	21	0.50(0.39)	3	A*06 A030 A031
-1SD	20	0.30(0.38)	1	A*24
	18	0.10(0.38)	5	A*08 A026 A*29 A032 A034
	17	-0.10(0.38)	3	A004 A*12 A033
	15	-0.30(0.38)	1	A*16
-2SD	14	-0.50(0.39)	2	A025 A027
	13	-0.70(0.39)	3	A002 A*14 A028
	11	-0.90(0.40)	1	A035
	10	-1.10(0.41)	2	A*19 A*22
-3SD	9	-1.30(0.42)	2	A*03 A*21
	8	-1.50(0.44)		
	7	-1.70(0.46)	1	A018
	6	-1.90(0.48)		
-4SD	5	-2.10(0.52)	2	A001 A023
		-2.30(0.52)		

Figure 5
MAP OF VARIABLE: Part A
(n=225-3-8=214 college students)

	RAW SCORE	MEASURE MIDPOINT(S.E.)	ITEM COUNTS	TYPICAL ITEMS (BY NAME)
	34	3.90(1.03)		
+3SD		3.70(1.03)		
		3.50(1.03)		
		3.30(1.03)		
	33	3.10(0.75)		
+2SD		2.90(0.75)		
	32	2.70(0.63)		
		2.50(0.63)		
	31	2.30(0.56)		
+1SD	30	2.10(0.51)		
		1.90(0.51)	3	A07 A09 A15
	29	1.70(0.48)	1	A05
	28	1.50(0.46)		
MEAN	26	1.30(0.42)	1	A30
	25	1.10(0.41)		
	24	0.90(0.40)		
	23	0.70(0.39)		
-1SD	21	0.50(0.38)	7	A01 A10 A12 A13 A17 A20 A26
	20	0.30(0.37)	1	A02
	18	0.10(0.37)	3	A06 A11 A33
	17	-0.10(0.37)	5	A04 A08 A24 A28 A29
-2SD	15	-0.30(0.37)	4	A14 A16 A31 A32
	14	-0.50(0.37)	1	A25
	12	-0.70(0.38)	1	A19
	11	-0.90(0.39)	4	A21 A27 A34 A35
-3SD	10	-1.10(0.40)	1	A23
	8	-1.30(0.43)	1	A18
	7	-1.50(0.45)	1	A03
	6	-1.70(0.47)		
-4SD		-1.90(0.47)	1	A22
	5	-2.10(0.51)		

Figure 6
MAP OF VARIABLE (Part B: n=797-24=773)

	RAW SCORE	MEASURE MIDPOINT(S.E.)	ITEM COUNTS	TYPICAL ITEMS (BY NAME)
+5SD	34	3.90(1.03)		
		3.70(1.03)		
		3.50(1.03)		
		3.30(1.03)		
+4SD	33	3.10(0.75)		
		2.90(0.75)		
	32	2.70(0.63)		
+3SD		2.50(0.63)		
	31	2.30(0.56)		
	30	2.10(0.52)	1	B003
	29	1.90(0.48)	1	B*06
+2SD	28	1.70(0.46)		
	27	1.50(0.44)	3	B002 B013 B*17
	26	1.30(0.42)	1	B007
	25	1.10(0.41)		
+1SD	24	0.90(0.40)		
	22	0.70(0.39)	2	B025 B030
	21	0.50(0.38)	3	B010 B024 B035
	19	0.30(0.38)	4	B004 B*05 B012 B*22
MEAN	18	0.10(0.38)	4	B008 B*11 B*29 B033
	17	-0.10(0.38)	3	B*14 B016 B020
	15	-0.30(0.38)	1	B023
-1SD	14	-0.50(0.38)	3	B*09 B031 B*32
	12	-0.70(0.39)	1	B*18
	11	-0.90(0.40)		
	10	-1.10(0.41)	3	B*15 B*26 B034
-2SD	9	-1.30(0.43)	2	B*21 B*28
	8	-1.50(0.44)	1	B*01
	7	-1.70(0.46)	1	B027
	6	-1.90(0.49)		
-3SD	5	-2.10(0.52)		
	4	-2.30(0.57)		
		-2.50(0.57)	1	B019
	3	-2.70(0.64)		

Figure 7
MAP OF VARIABLE: Part B
(n=232-2-4=226 college students)

	RAW SCORE	MEASURE MIDPOINT(S.E.)	ITEM COUNTS	TYPICAL ITEMS (BY NAME)
	34	4.10(1.04)		
		3.90(1.04)		
+3SD		3.70(1.04)		
		3.50(1.04)		
	33	3.30(0.76)		
		3.10(0.76)		
+2SD	32	2.90(0.65)		
		2.70(0.65)	1	B03
	31	2.50(0.58)		
		2.30(0.58)		
	30	2.10(0.53)	1	B13
+1SD	29	1.90(0.49)		
	28	1.70(0.47)	3	B02 B06 B17
	27	1.50(0.45)		
	26	1.30(0.43)		
MEAN	25	1.10(0.42)		
	24	0.90(0.41)	2	B07 B30
	22	0.70(0.39)	1	B24
	21	0.50(0.39)	3	B04 B10 B35
	20	0.30(0.38)	1	B16
-1SD	18	0.10(0.38)	6	B08 B11 B12 B14 B23 B25
	17	-0.10(0.38)	3	B22 B32 B33
	15	-0.30(0.38)	3	B05 B20 B29
	14	-0.50(0.39)		
	13	-0.70(0.39)	2	B09 B31
-2SD	11	-0.90(0.40)	1	B26
	10	-1.10(0.41)	3	B15 B18 B28
	9	-1.30(0.42)	2	B21 B27
	8	-1.50(0.44)		
-3SD	7	-1.70(0.46)	2	B01 B34
	6	-1.90(0.48)		
	5	-2.10(0.52)		
		-2.30(0.52)	1	B19

Figure 8
MAP OF VARIABLE (Parts A&B: n=60-6=54)

RAW SCORE	MEASURE MIDPT(S.E.)	ITEM COUNTS	TYPICAL ITEMS (BY NAME)
59	2.30(0.37)	1	B003
58	2.10(0.35)	1	A*07
+2SD 56	1.90(0.34)	3	B002 B*06 B013
54	1.70(0.32)	2	B007 B*17
52	1.50(0.31)	4	A*10 A011 A*15 B030
50	1.30(0.30)	2	B004 B035
+1SD 47	1.10(0.29)	6	A005 A009 A013 A*20 B010 B025
45	0.90(0.29)	2	A017 B033
42	0.70(0.28)	3	B016 B*22 B024
MEAN 40	0.50(0.28)	2	B008 B*29
37	0.30(0.28)	3	A*06 A*08 B031
3'	0.10(0.28)	8	A*24 A030 A031 B*09 B*11 B012 B*14 B*32
32	-0.10(0.28)	4	A004 A032 B*05 B020
-1SD 29	-0.30(0.28)	3	A034 B023 B034
27	-0.50(0.28)	4	A*12 A025 A026 A*29
24	-0.70(0.29)	1	B*28
-2SD 22	-0.90(0.30)	3	B*15 B*26 B027
20	-1.10(0.30)	6	A*14 A*19 A028 A033 B*18 B*21
18	-1.30(0.31)	1	A027
16	-1.50(0.32)	3	A002 A*16 A*21
-3SD 14	-1.70(0.34)		
12	-1.90(0.35)	1	B019
11	-2.10(0.36)	2	A*03 A*22
9	-2.30(0.39)	1	A035
-4SD 8	-2.50(0.41)	3	A018 A023 B*01
7	-2.70(0.43)		

Figure 9

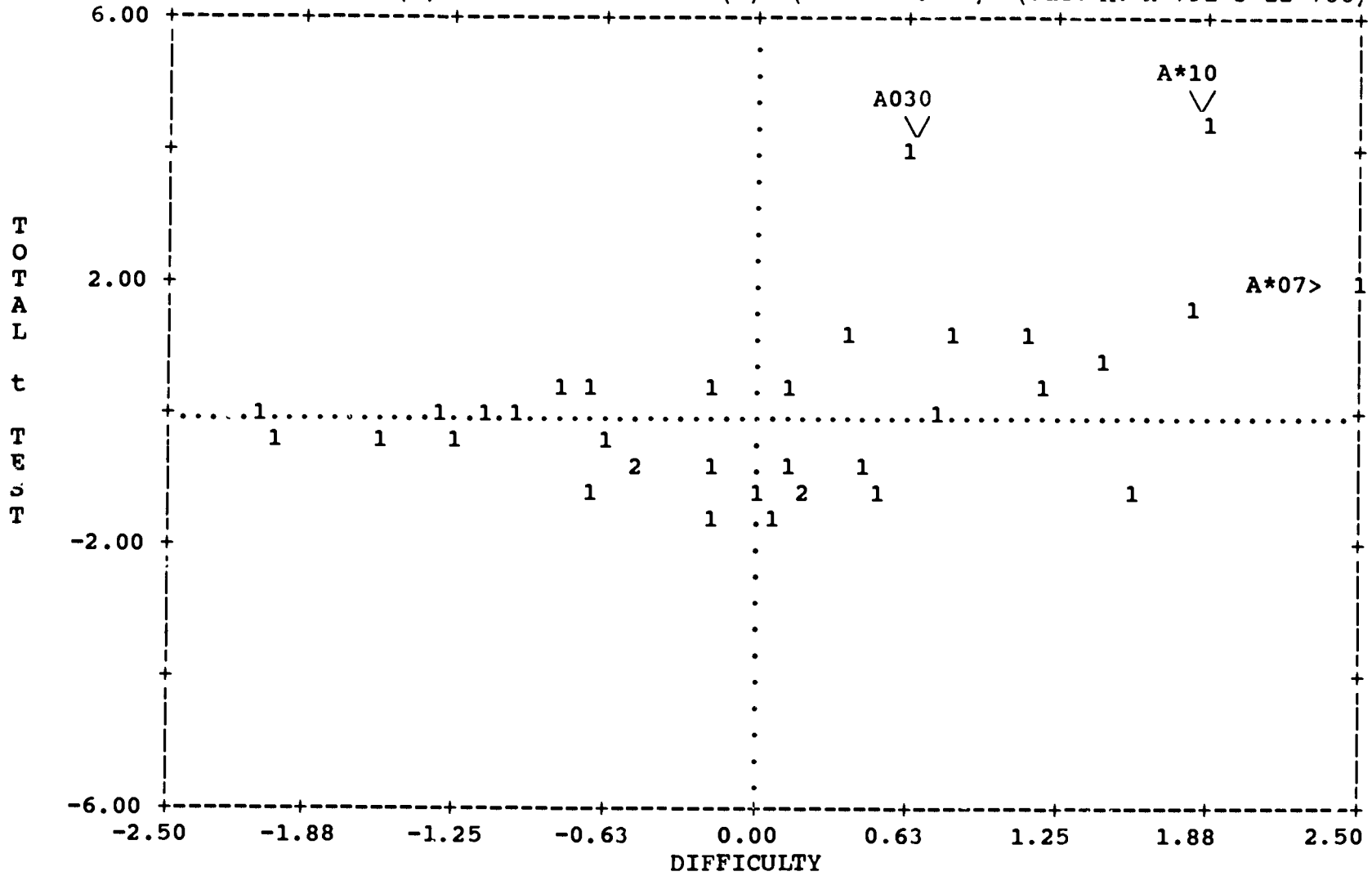
TOTAL FIT t-TEST (Y) VERSUS DIFFICULTY (X) (CORR = 0.43) (Part A: n=791-3-22=766)
6.00
2.00
-2.00
-6.00
TOTAL t TEST
A030
A*10
A*07>
-2.50
-1.88
-1.25
-0.63
0.00
0.63
1.25
1.88
2.50
DIFFICULTY

Figure 10

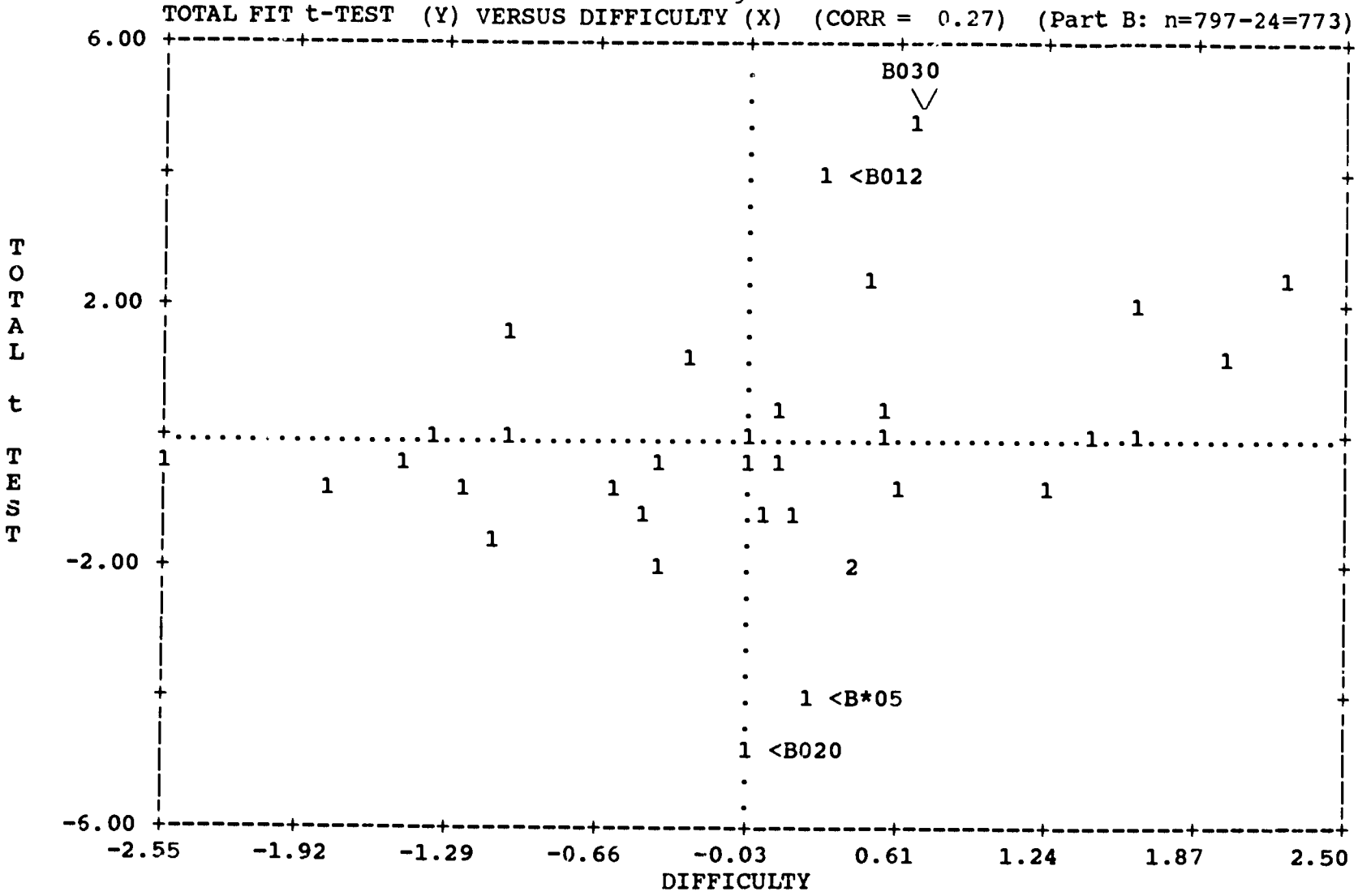
TOTAL FIT t-TEST (Y) VERSUS DIFFICULTY (X) (CORR = 0.27) (Part B: n=797-24=773)
6.00
2.00
-2.00
-6.00
TOTAL t TEST
B030
1 <B012
1 <B*05
1 <B020
-2.55
-1.92
-1.29
-0.66
-0.03
0.61
1.24
1.87
2.50
DIFFICULTY

Figure 11

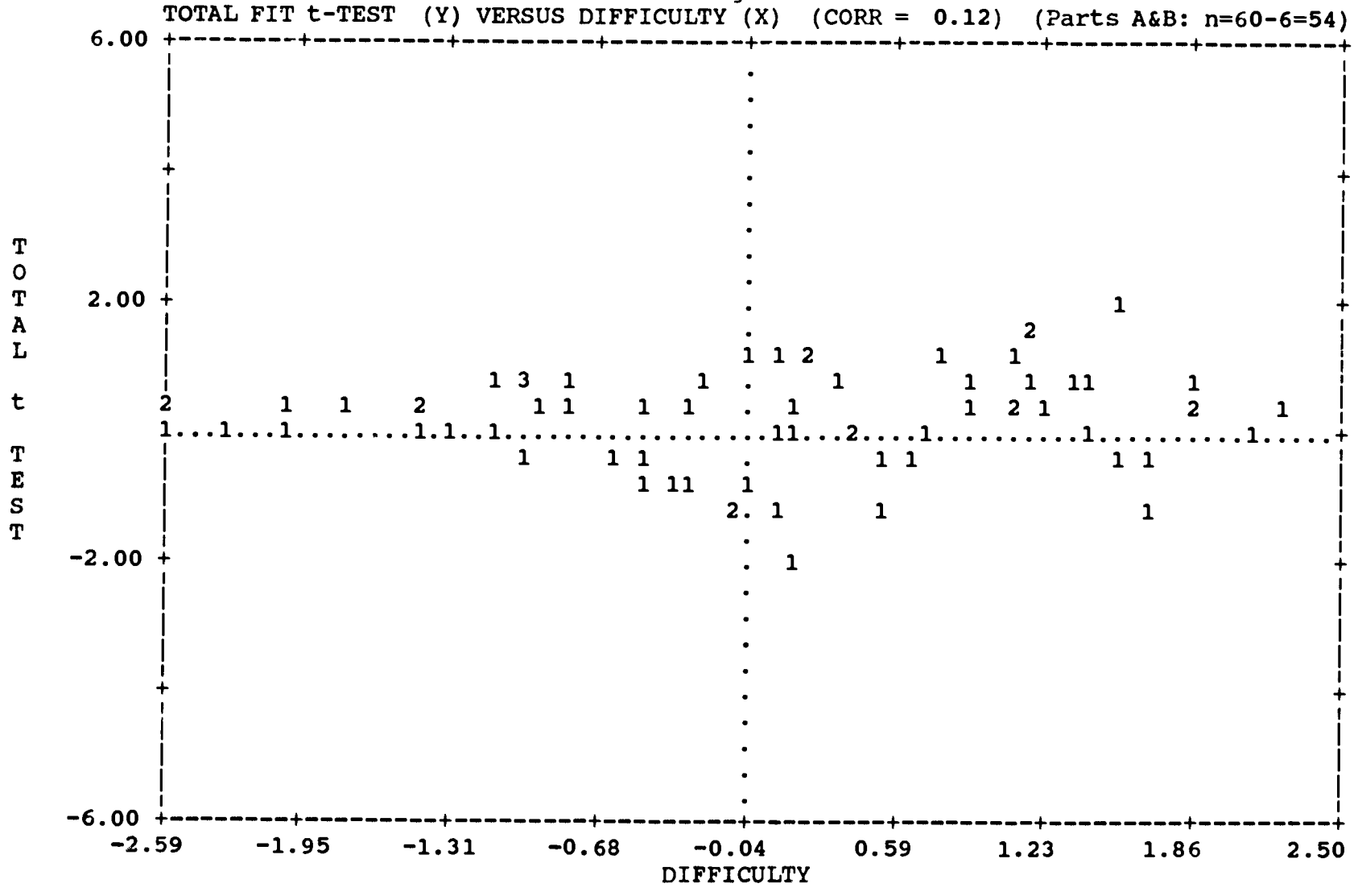
TOTAL FIT t-TEST (Y) VERSUS DIFFICULTY (X) (CORR = 0.12) (Parts A&B: n=60-6=54)
6.00
2.00
-2.00
-6.00
TOTAL t TEST
-2.59
-1.95
-1.31
-0.68
-0.04
0.59
1.23
1.86
2.50
DIFFICULTY

Figure 12

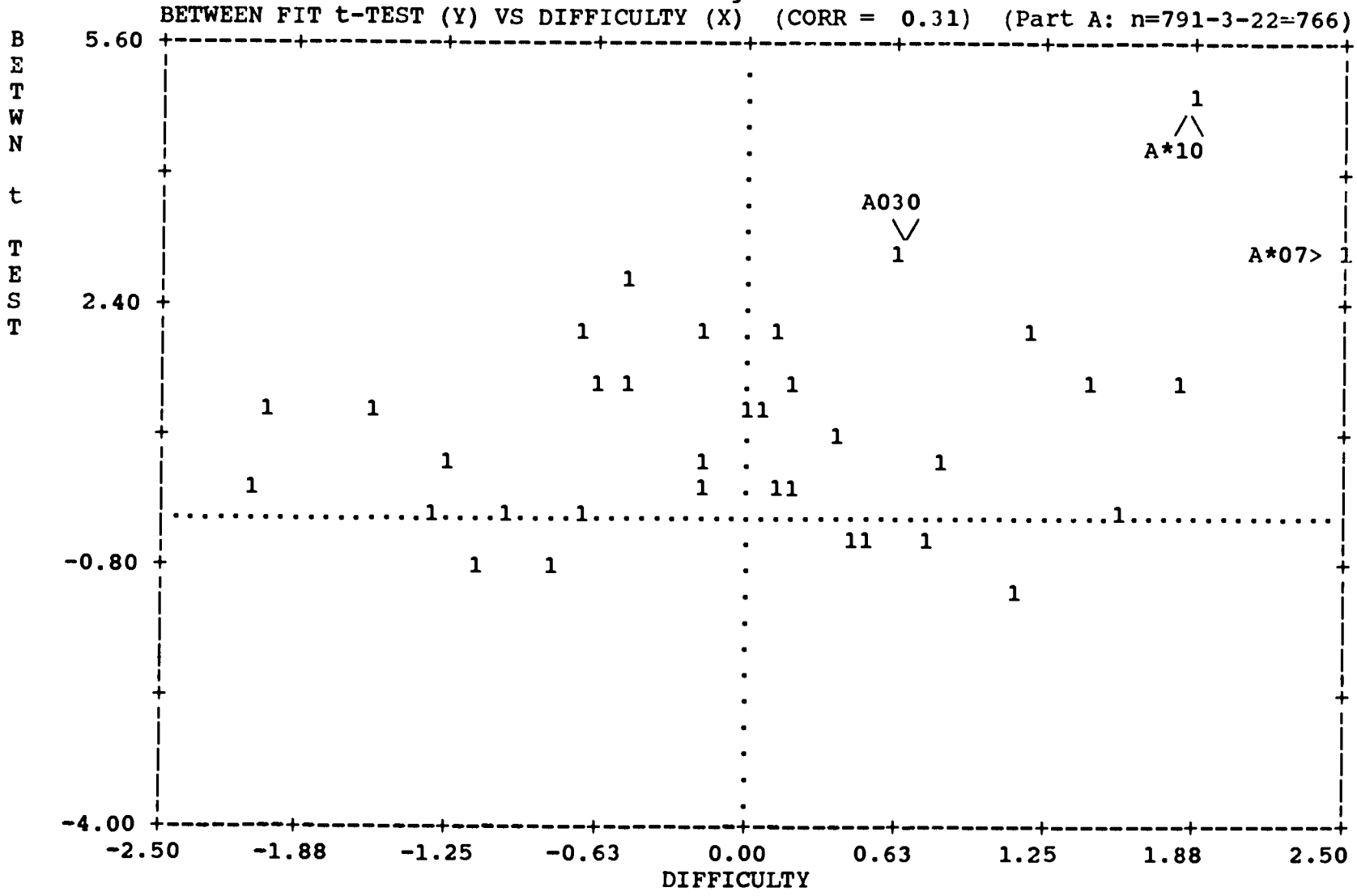
BETWEEN FIT t-TEST (Y) VS DIFFICULTY (X) (CORR = 0.31) (Part A: n=791-3-22=766)
BETWN t TEST
5.60
2.40
-0.80
-4.00
A*10
A030
A*07>
-2.50
-1.88
-1.25
-0.63
0.00
0.63
1.25
1.88
2.50
DIFFICULTY

Figure 13

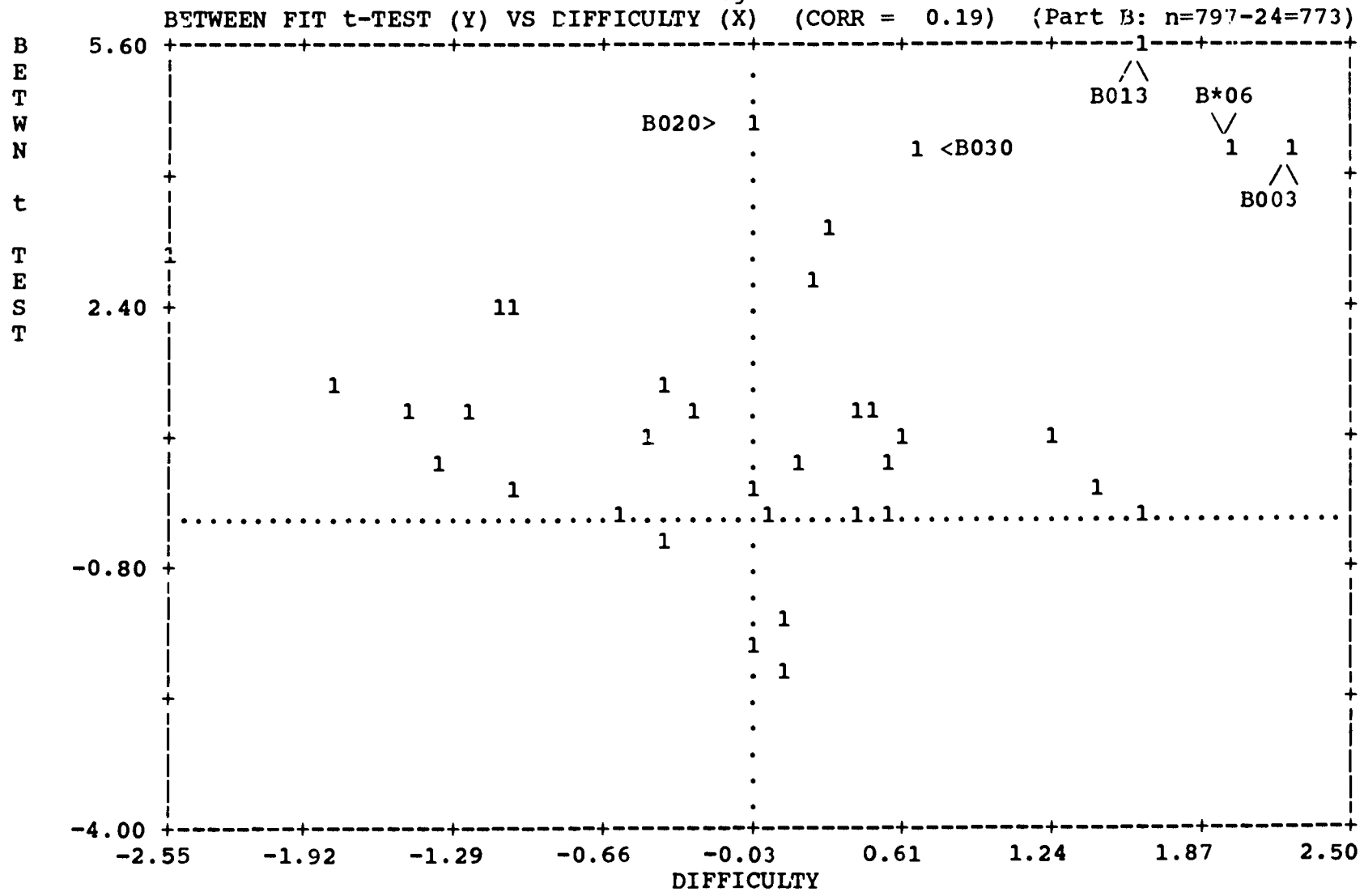
BETWEEN FIT t-TEST (Y) VS DIFFICULTY (X) (CORR = 0.19) (Part B: n=797-24=773)
B
E
T
W
N
t
T
E
S
T
5.60
2.40
-0.80
-4.00
B020>
1 <B030
B013
B*06
B003
-2.55
-1.92
-1.29
-0.66
-0.03
0.61
1.24
1.87
2.50
DIFFICULTY

Figure 14

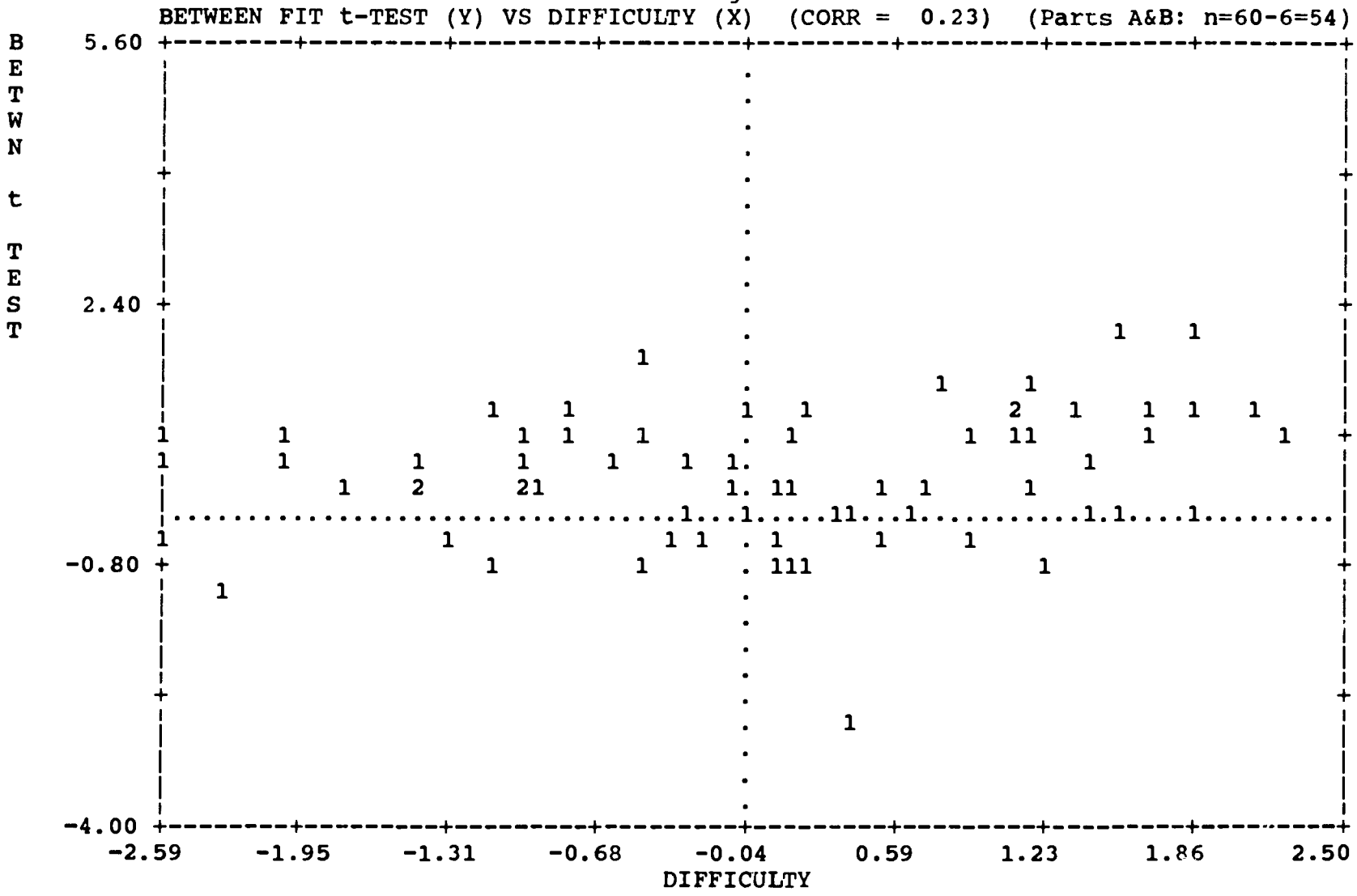
BETWEEN FIT t-TEST (Y) VS DIFFICULTY (X) (CORR = 0.23) (Parts A&B: n=60-6=54)
BETWN t TEST
5.60
2.40
-0.80
-4.00
-2.59
-1.95
-1.31
-0.68
-0.04
0.59
1.23
1.86
2.50
DIFFICULTY

Figure 15
TOTAL FIT t-TEST (Y) VERSUS DISCRIMINATION (X) (CORR = -0.93)
(Part A: n=791-3-22=766)

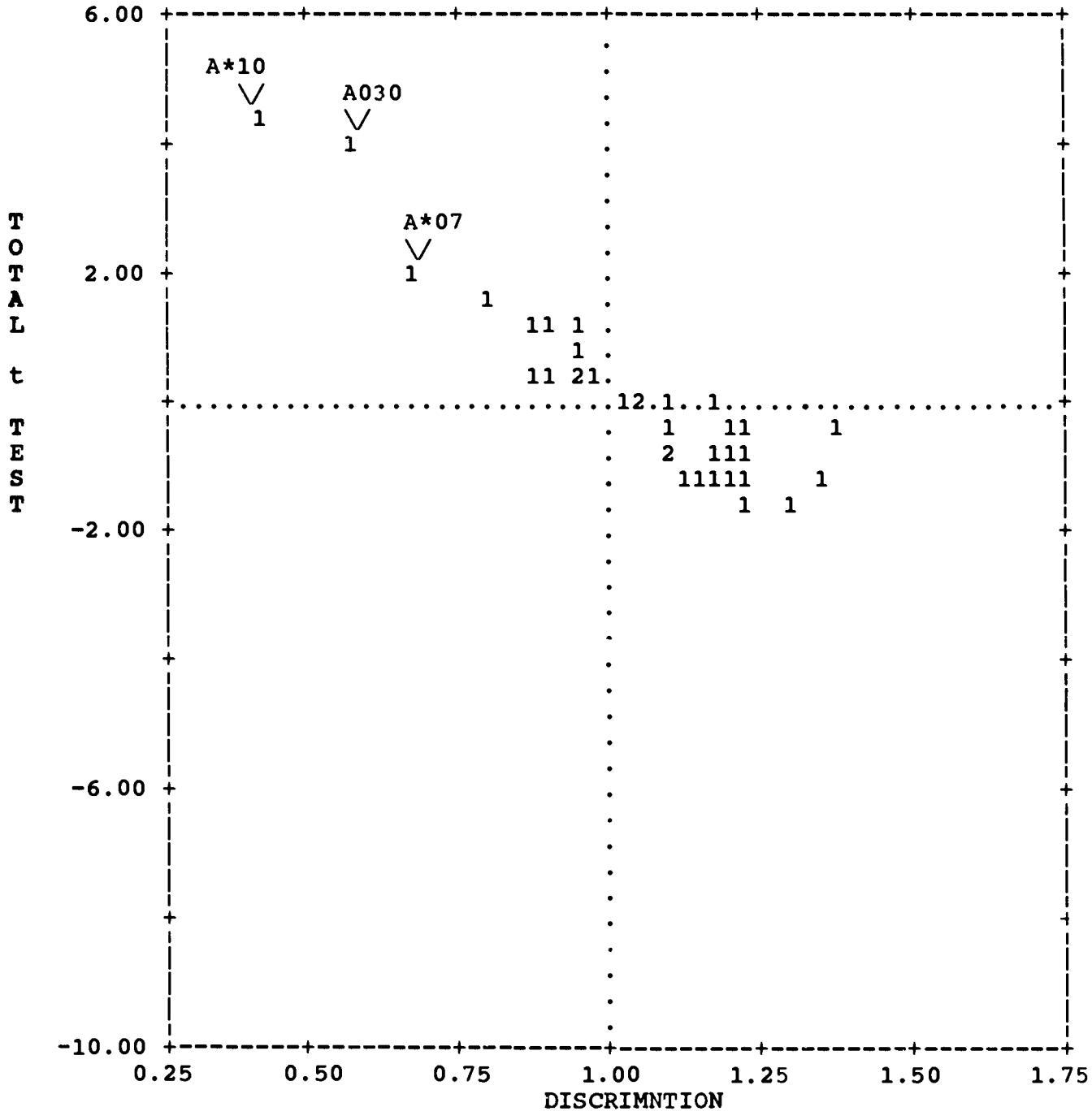

Figure 16
TOTAL FIT t-TEST (Y) VERSUS DISCRIMINATION (X) (CORR = -0.87)
(Part B: n=797-24=773)

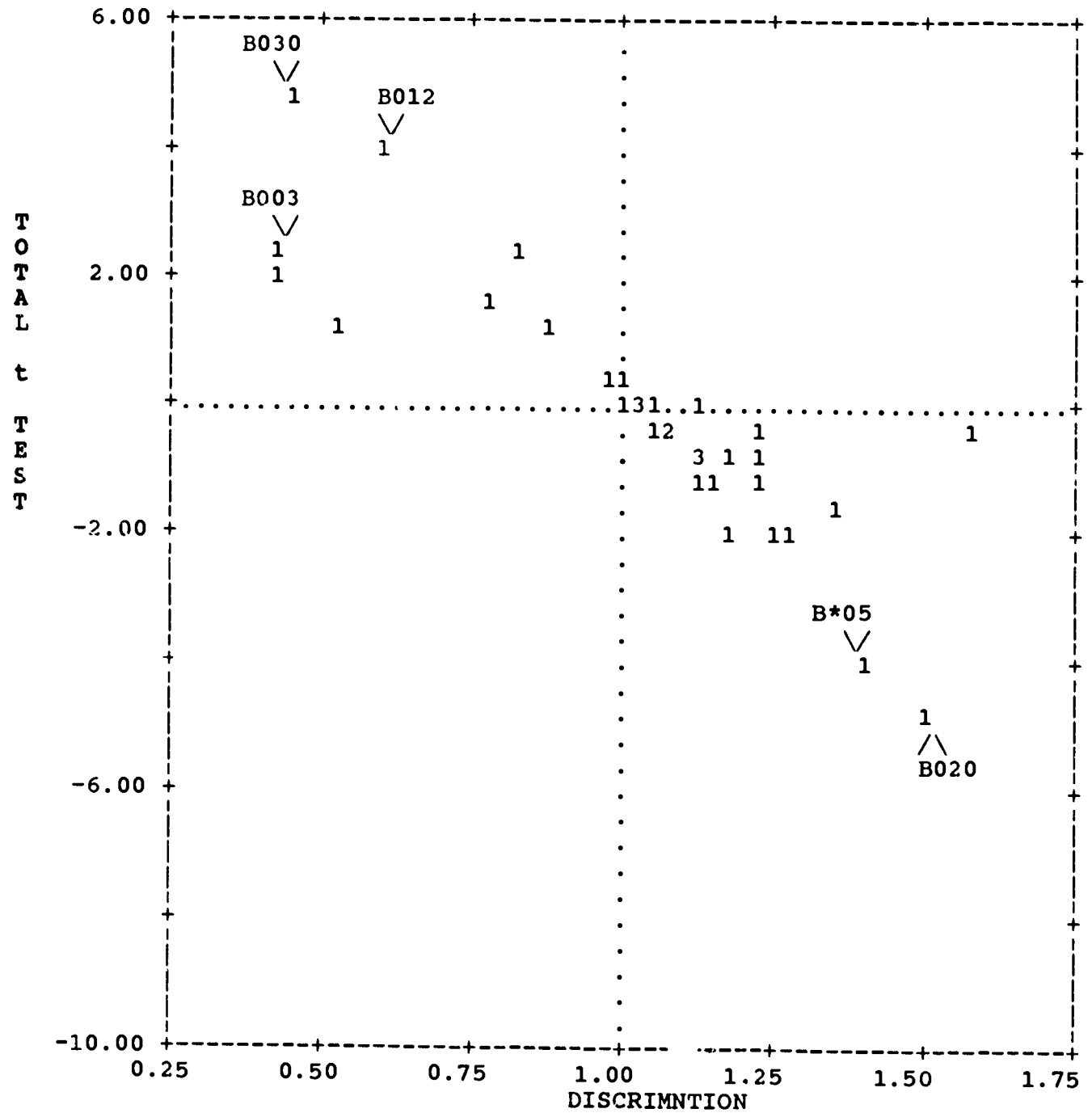

Figure 17
TOTAL FIT t-TEST (Y) VERSUS DISCRIMINATION (X) (CORR = -0.84)
(Parts A&B: n=60-6=54)

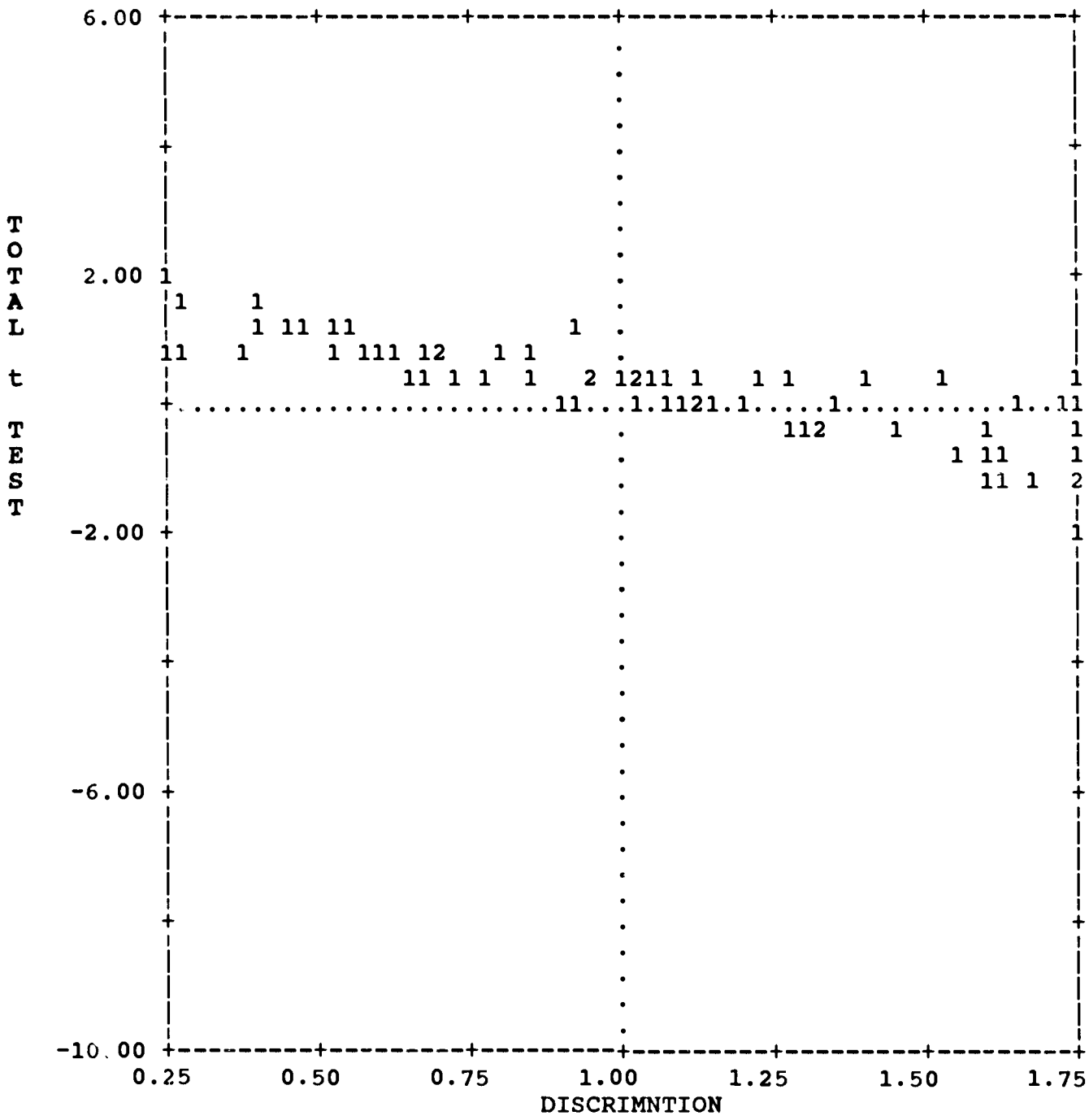

Figure 18
TOTAL FIT t-TEST (Y) VERSUS BETWEEN FIT t-TEST (X)
(Part A: n=791-3-22=766)

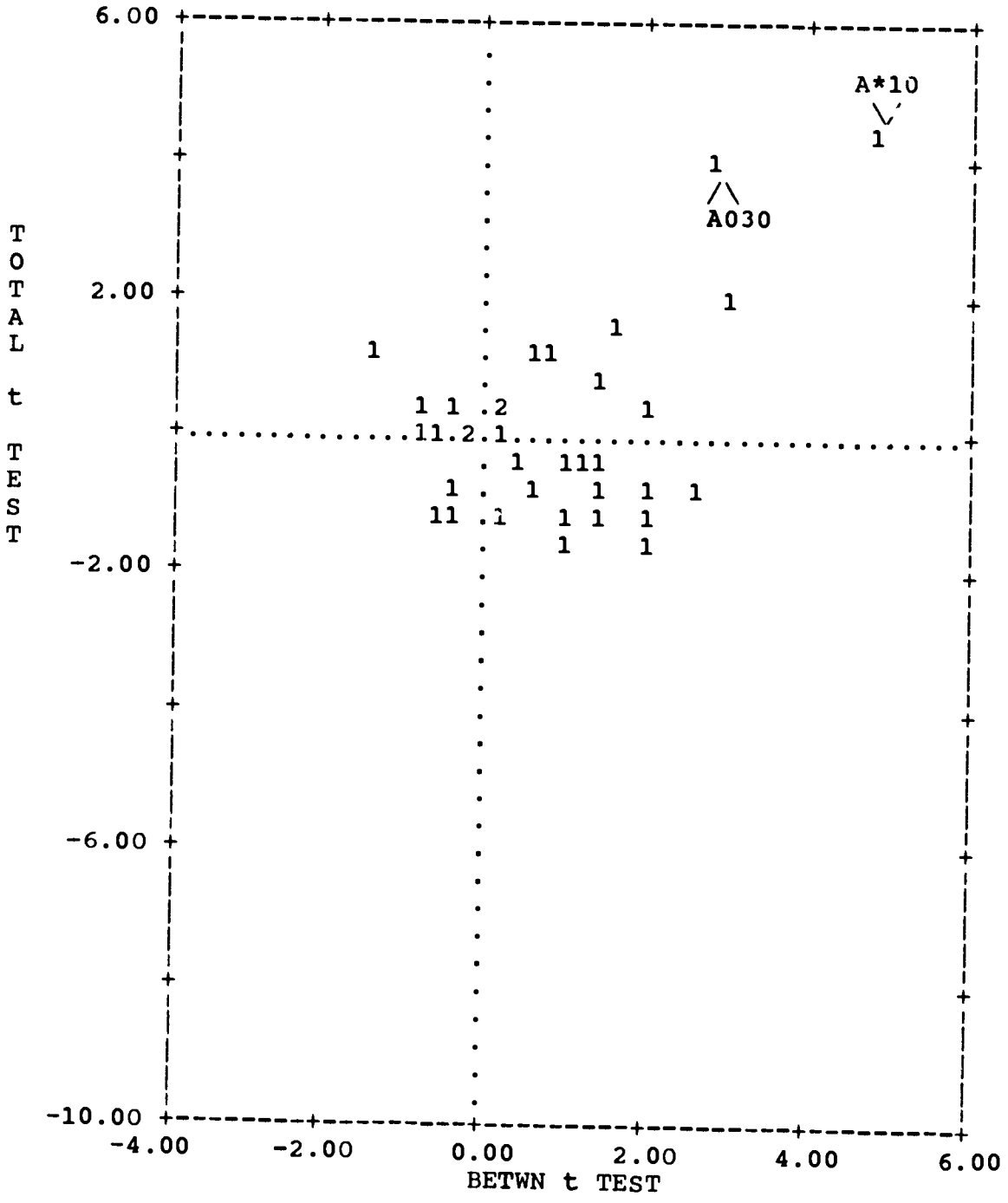

Figure 19
TOTAL FIT t-TEST (Y) VERSUS BETWEEN FIT t-TEST (X)
(Part B: n=797-24=773)

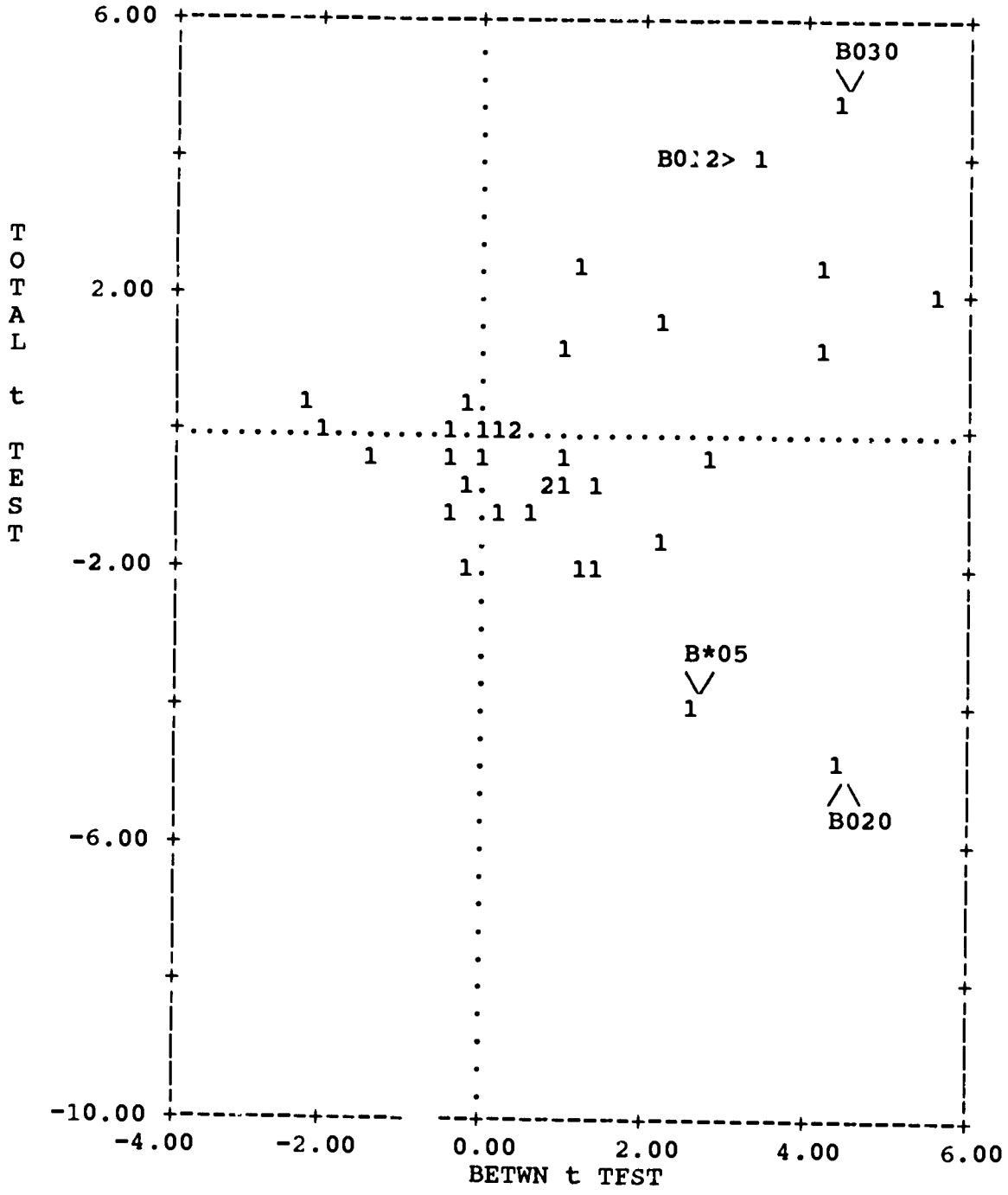

Figure 20
TOTAL FIT t-TEST (Y) VERSUS BETWEEN FIT t-TEST (X)
(Parts A&B: n=60-6=54)