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ABSTRACT

Special and regular education reforms toward more inclusionary models impact the practice of school psychology. Traditional school psychological services involving testing and placement are being challenged through inclusive education initiatives. In this study, school psychologists' attitudes toward inclusive education were measured via a Rasch model of a brief attitude scale (N=298). The Attitude Toward Inclusive Education Scale (ATIES) records positive and negative attitudes toward integrating children with various disabilities in regular classes. Rasch analysis resolved the nonlinear relationship between the finite range of recorded ATIES scores and the conceptually infinite range of attitudes. Results showed that the ATIES items calibrated in a recognizable hierarchy reflecting the impact of the student's disability on his or her own learning or the learning of classmates and the extent of the regular classroom accommodations required by the student. Implications of the present findings for school psychology research and practice are discussed. (Two tables and two figures present data and statistical analysis. Contains 22 references.) (Author/TS)

Running Head: ATTITUDES TOWARD INCLUSIVE EDUCATION

SCHOOL PSYCHOLOGISTS' ATTITUDES TOWARD INCLUSIVE EDUCATION: A RASCH ANALYSIS

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Abstract

School psychologists' attitudes toward inclusive education were measured via a Rasch model of a brief attitude scale. The Attitude Toward Inclusive Education Scale records positive and negative attitudes toward integrating children with various disabilities in regular classes. Rasch analysis resolved the nonlinear relationship between the finite range of recorded ATIES scores and the conceptually infinite range of attitudes. Results showed that the ATIES items calibrated in a recognizable hierarchy reflecting the impact of the student's disability on his or her own learning or the learning of classmates and the extent of the regular classroom accommodations required by the student. Implications of the present findings for school psychology research and practice are discussed.

School Psychologists' Attitudes Toward Inclusive Education: A Rasch Analysis

Special and regular education reforms toward more inclusionary models impact the practice of school psychology (Reschly, 1988). Traditional school psychological services involving testing and placement--special education gatekeeping--are being challenged through inclusive education initiatives (Stainback & Stainback, 1988). The National Association of School Psychologists has urged its members to advocate for the development of inclusive programs for students with disabilities (NASP, 1993). How do practicing school psychologists view educational reforms such as inclusion? Are full inclusion models preferred? Do school psychologists defend traditional practices or have attitudes changed?

Preservice and inservice teachers apparently hold ambivalent attitudes about inclusive education (for example, see Knoff, 1985; Vaughn, Schumm, Jallad, Slusher, & Saumell, 1995; and Wilczenski, 1993); however, school psychologists' attitudes toward inclusion have not been assessed. Considering the critical role of school psychologists in placement decisions and the potential impact of educational reforms on the profession, it is important to examine the attitudes of practitioners toward initiatives such as inclusion which may profoundly alter school psychology practice.

Use of the Rasch Model to Develop an Attitude Scale

The Rasch measurement model is one of several psychometric models explained by item response theory (Hambleton & Swaminathan, 1985). This model has been used extensively to develop tests of educational attainment and increasingly to develop attitude and personality measures (Meier, 1994). Applications of the Rasch model in work relevant to school psychology include the development of scales to measure attitudes toward school (Masters, 1984), the measurement of childhood depression (DeRoos & Allen-Meares, 1992), analyzing cognitive proficiency (Sheehan & Mislevy, 1990), and the detection of item bias in the assessment of test session behavior (Nandakumar, Glutting, & Oakland, 1993). Lambert (1991) exhorted testing practitioners to become familiar with the modern test models. This paper describes an application of the Rasch model in measuring school psychologists' attitudes toward inclusive education.

Attitudes toward inclusive education may be expected to vary based on the social, physical, academic, or behavioral accommodations that students with disabilities need in order to participate in activities in regular classes, regardless of their handicap classification. The Attitudes Toward Inclusive Education Scale (ATIES) was designed to measure attitudes toward including children with various functional disabilities in regular classes. Sixteen items describing social, physical, academic, and behavioral problems which may adversely affect functioning in the classroom are contained on the ATIES. Items

are rated according to a six-point Likert-type classification with strongly agree/strongly disagree anchors. Ratings are summed across items to indicate positive or negative attitudes toward inclusive education. Scores range from 16 to 96 with high scores indicating more favorable attitudes.

Because the ATIES raw scores cover a limited range of responses and are made up of only ordinal ratings, they do not meet the conditions for measurement. Measurement requires that (a) the greater the amount, the larger the number associated with it; and (b) an additional amount associated with the increase of a number by one unit is of the same size (Wright & Linacre, 1989; Wright & Stone, 1979). Rasch analysis is a statistical procedure for constructing interval measures from unidimensional ordinal data. Raw scores on the ATIES were transformed by Rasch analysis to allow ratings by each school psychologist to be located at a defined point on an additive scale of attitude toward inclusive education.

ATIES raw scores are counts of the agree/disagree ratings of attitude toward inclusive education which each school psychologist recorded. If variations in attitude are unidimensional, each school psychologist can be described by a single latent attitude measure, and each item by a single latent difficulty calibration both of which are positions on a linear measurement continuum. The probability of answering a given ATIES item positively depends on the school psychologist's attitude and the characteristics of the item. Latent measures and calibrations are not observable but inferred from the ordinal

observations obtained by the school psychologist ratings. Observations are modeled from these latent measures and calibrations. When the data are unidimensional, the measures are useful in evaluating school psychologists' attitudes (see Andrich, 1988; Hambleton & Swaminathan, 1985; Wright, 1977; Wright & Masters, 1982).

It was hypothesized that the ATIES items would calibrate in a recognizable hierarchy reflecting the impact of the student's disability on his or her own learning or the learning of classmates and the extent of the regular classroom accommodations required by the student. School psychologists would be most agreeable to integrating students who required only minor classroom accommodations but less agreeable as the demands for accommodations increase. It follows then, on the ATIES, school psychologists should find it easiest to agree with items relating to social integration, next to agree with physical integration, then to agree with academic integration, and find it most difficult to agree with items addressing the integration of students with behavioral problems in regular classes. The objectives of this study were to assess the attitudes of school psychologists toward inclusive education and to demonstrate the utility of Rasch analysis for scaling the ATIES into a measure of attitudes toward inclusive education among school psychologists.

Method

Subjects

Data concerning school psychologists' attitudes toward inclusive education were collected as part of a larger nationwide

longitudinal study of professional roles and functions. (Wilczenski, Bontrager, & Bosco, 1995). In the Spring of 1992, forced-choice surveys were mailed to a random sample of 1000 "regular" members of the National Association of School Psychologists. Seven hundred thirty-nine surveys (74%) were returned the first year. Annual follow-up surveys were sent to the previous year's respondents from 1993 through 1995; returns for each of the 3 follow-up years were: 442 (62%), 298 (68%), and 202 (68%). The ATIES was included on the 1994 survey. Initial and follow-up samples were representative of the NASP membership on important demographic variables (see Table 1). Survey respondents (N=298) had a median 11 years of experience in the field of school psychology.

Insert Table 1 about here

Instrument

A 16-item scale was developed to measure attitudes toward inclusive education; specifically, the feasibility of a regular class placement for students requiring social, physical, academic, or behavioral accommodations in the classroom. Social integration refers to the placement of students with social difficulties in regular classes. Items concerning physical integration refer to the placement of students with physical or sensory disabilities in regular classes. Academic integration pertains to the placement of students with learning problems in regular classes. Statements about behavioral integration

question the placement of students manifesting behavior problems in regular classes. The scale was anchored by extreme ratings of strongly disagree (1) and strongly agree (6).

Statistical analyses

Rasch analysis of ATIES items was carried out with BIGSTEPS (Wright & Linacre, 1993), a computer program for the analysis of rating scale data. Two school psychologists' records with ratings indicating strong agreement with all ATIES items were excluded because such records did not provide enough information concerning the full extent of possible attitudes to be useful. The infinite range of attitude possibilities below the floor and above the ceiling of the available ATIES ratings was represented by finite values just beyond the most extreme estimable measures. To standardize the results, the origin of the measurement scale was placed in the middle of the item calibrations, so that the sum of the calibrations was zero. Measures are reported in terms of a log-odds unit (logit) which is the natural log of the odds of a correct response. Through Rasch analysis, raw response data from the persons and items are transformed into measures and calibrations in logits so that person and item information can be interpreted using the same equal-interval units of measurement. The contrast attitude minus item difficulty is a logit representing the odds of a favorable response.

Results

Rasch analysis measures estimated from the records of 296 school psychologists are shown in Table 2. When the attitudes of

group are transformed so that the mean is 0 and the standard deviation is 1, the measures typically range from -2.0 to +2.0 (Hambleton & Swaminathan, 1985); values near -2.0 correspond to easy items and values near +2.0 correspond to difficult items. Results of the ATIES analysis indicated that the easiest item on which school psychologists agreed, that with the most negative calibration (-1.82), concerned integrating students with relatively minor academic problems whereas the most difficult item, with a large positive logit value (+2.18), concerned integrating students who are physically aggressive in the classroom. Items referring to the social, physical, academic and behavioral aspects of inclusive education are noted in the Table. Measures had standard errors on the order of .07 logits (see Table 2).

Insert Table 2 about here

Accompanying each measure in Table 2 are infit and outfit statistics comparing the variance of the ratings observed in the data with that predicted by the Rasch measurement model. Infit is the standardized information-weighted mean-square statistic sensitive to unexpected responses near a person's ability level; outfit is the outlier mean-square statistic sensitive to unexpected responses far from a person's ability level. Both fit statistics have an expectation of 1. Values near 1.0 indicate satisfactory functioning of the item. Fit values below 0.7 indicate excessive predictability in the school psychologists'

ratings so that the item is not providing independent information as to the attitude of the school psychologist whereas values greater than 1.3 either indicate excessive randomness in the ratings or more likely, a specific, systematic problem causing the observed responses to differ from the expected responses. Extremely high or low infit and outfit values indicate serious misfit which threatens valid measurement. (see Wright & Linacre, 1993). Item misfit criteria of $\pm$0.3 are commonly applied with rating scales (Wright & Linacre, 1994); statistics in Table 2 indicated adequate fit for the ATIES items. Only the item addressing language disorders was not providing independent information, perhaps overlapping with other communication items.

A map showing the distribution of persons and items was constructed (see Figure 1). The attitude variable was drawn vertically with the school psychologists most favorable to inclusion and the most difficult items at the top. Column 1 locates the school psychologist attitude measures along the variable; each sharp (#) represents 5 persons and each dot (.) is 1 to 4 persons. The distribution indicates generally favorable attitudes toward inclusion. As indicated in the second column, the responses of the sample covered a range of 11 logits (+6.0 to -5.0). The third column lists the ATIES item numbers by difficulty; for example, the item dealing with including children who present disruptive behavior in regular classes was about a logit more difficult to agree with than the item addressing inclusion for children requiring a functional academic curriculum.

Insert Figure 1 about here

Item calibrations in Table 2 enabled the construction of a conversion from ATIES scores to linear measures. Figure 2 plots the curvilinear relationship of raw scores to latent attitude as measured from a Rasch model scaling of the ATIES (see Embretson, 1995). The nonlinear ogival shape of the curve shows how a finite range of ATIES raw scores maps onto a conceptually infinite range of school psychologists' attitudes toward inclusive education. Thus, raw scores are monotonically, but not linearly, related to latent attitudes. This figure shows the extent to which the use of ATIES raw scores as though they were already linear measures is unsatisfactory. A change in attitude of 8 points at the extremes of the ATIES range is much greater than a similar change in score points at the center of the ATIES range.

Insert Figure 2 about here

Discussion

Rasch analysis is a useful technique to evaluate instruments which are intended to measure scaled behavior, including attitudes. In this project, I examined the scalability of the Attitudes Toward Inclusive Education Scale for school psychologists. Rasch analysis of the ATIES ratings confirmed that the scale has measurement properties that can be obtained by converting the nonlinear ATIES scores into linear measures.

Analysis of the ATIES combined all 16 items into one set to define and to quantify a single measurement scale of attitudes toward inclusive education. Item fit statistics were acceptable which suggests that the unidimensionality assumption is plausible.

Empirically determined ATIES attitude calibrations were ordered in a meaningful hierarchy. A progression of item difficulties reflected increasing demands upon school staff to modify the academic curriculum or structure of classrooms to accommodate students whose disabilities interfered with their own learning or the learning of others. Full inclusion models were not favored; rather school psychologists seemed to base their ratings on an assessment of the person/environment fit. School psychologists found it easiest to agree with statements describing the need for only minor regular class accommodations such as academic or social integration, followed by statements concerning the integration of students with physical disabilities, and hardest to agree with items addressing the integration of students manifesting significant academic and behavioral problems which would require substantial accommodations.

This analysis indicated an acceptable fit of the ATIES data to the Rasch model. Therefore, several advantages are obtained: attitude measures are not scale-dependent and item difficulty indices are not sample-dependent (see Hambleton & Swaminathan, 1985; Wright & Stone, 1979). The results of this study have immediate application in studies of inclusive education because

the ATIES is a linear measure whose scoring is not dependent on local data and attitudes toward inclusive education can be established based on these scaling results.

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Table 1

Comparison of NASP Membership and 1994 Survey Respondents

	NASP*		Sample 1994	
Gender				
Males	6765	32%	101	34%
Females	14603	68%	197	66%
Regional Distribution				
Northeast	4781	30%	93	31%
Southeast	3140	20%	54	18%
North Central	3222	20%	58	20%
West Central	2004	13%	33	11%
West	2615	17%	59	20%
Degree Status				
Masters or Specialist	14008	76%	220	74%
Doctorate	4327	24%	78	26%
Nationally Certified	17000[a]	75%	223	75%

*NASP Membership Data - April, 1992

[a] Estimate per NASP Certification Department

Table 2

ATIES items calibrated in logits with standard errors and mean-square variance-ratio fit statistics.

Item #	Item Topics and Categories*	Calibrations	Standard Errors	Fit Statistics Infit	Outfit
1	Minor curriculum changes (A)	-1.82	.10	1.18	1.08
2	Shyness (S)	-1.57	.09	1.01	.96
3	Speech disorders (S)	-1.30	.09	.83	.79
4	Absenteeism (S)	-1.17	.09	1.21	1.23
5	Language disorders (S)	-.97	.08	.58	.56
6	Vision impairments (P)	-.82	.08	.93	.88
7	Mobility (P)	-.26	.07	1.13	1.12
8	Manual communication (P)	-.04	.07	1.02	1.01
9	Hearing impairments (P)	+.01	.07	.93	.92
10	Verbal aggression (B)	+.39	.07	.88	.88
11	Major curriculum changes (A)	+.71	.07	.90	.88
12	Functional academic training (A)	+.78	.07	1.18	1.19
13	Self-help skills training (A)	+.97	.07	1.10	1.10
14	Conflicts with authority (B)	+.98	.07	1.25	1.32
15	Disruptive behavior (B)	+1.92	.07	.94	.95
16	Physical aggression (B)	+2.18	.07	1.05	1.05

*Item Categories:
(S) = Social
(P) = Physical
(A) = Academic
(B) = Behavioral

Figure Caption

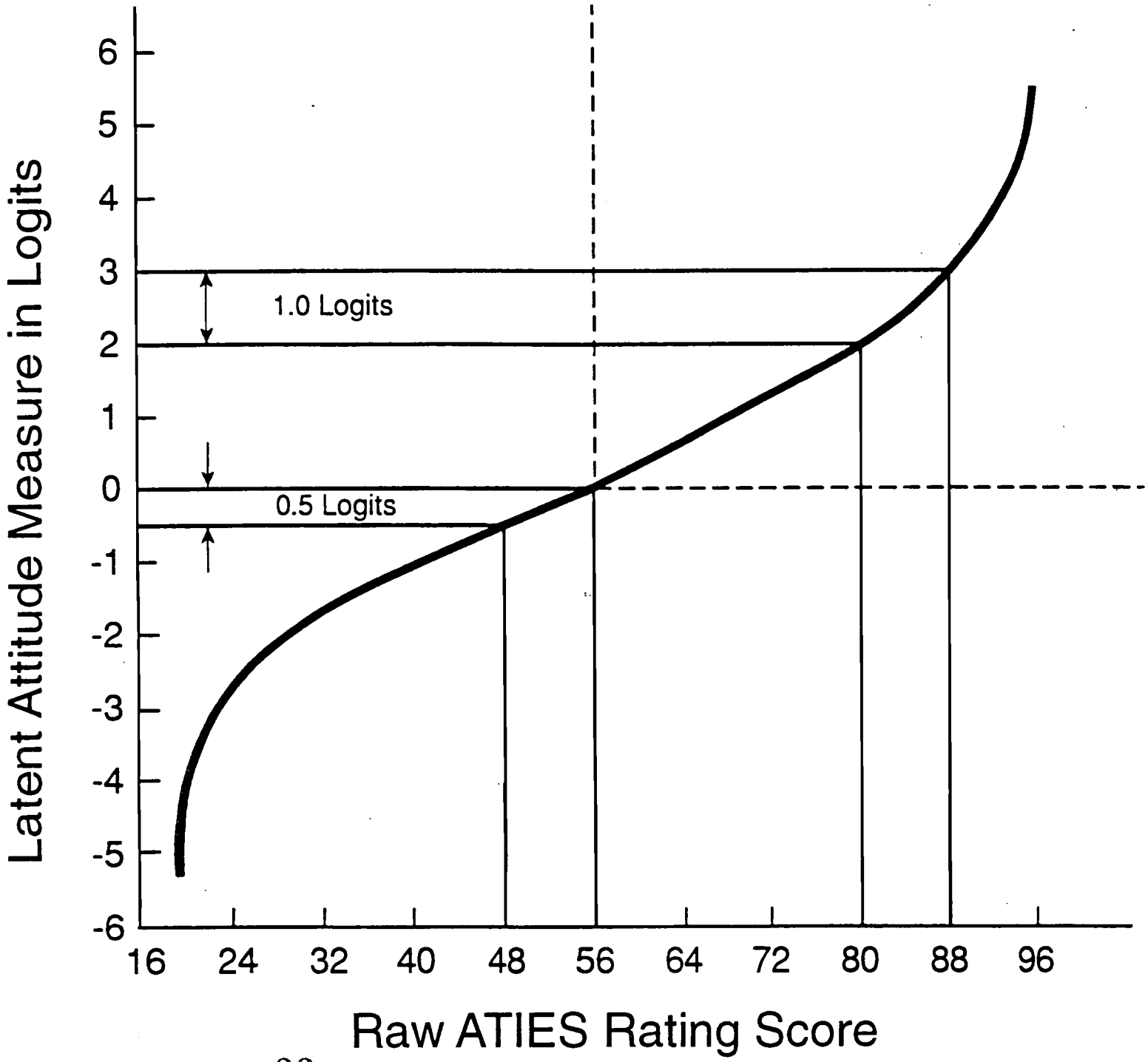
Figure 1. Map of persons and items.

Attitude Scale

Persons	Logits	Items
Agree		*Difficult*
•	6.0	
•	5.0	
•		
•		
•	4.0	
•		
•		
•#	3.0	
•##		
•#		16 Physical agg
•###	2.0	
####		15 Disruptive beh
#######		
•######	1.0	
•##########		12 Fuctional acad trng 13 Self-help trng 14 Conflicts
•######		9 Hearing impair 10 Verbal agg 11 Major curr changes
#####	.0	
##		7 Mobility 8 Manual comm
•#		5 Language dis 6 Vision impair
•	-1.0	
		3 Speech dis 4 Absenteeism
•		1 Minor curr change 2 Shyness
•	-2.0	
	-3.0	
	-4.0	
•	-5.0	
Disagree		*Easy*

Figure Caption

Figure 2. Relationship between raw scores and latent attitude measure on the ATIES.


Latent Attitude Measure in Logits
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
1.0 Logits
0.5 Logits
16
24
32
40
48
56
64
72
80
88
96
Raw ATIES Rating Score

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