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Refining a Multidimensional Model of Community Adjustment Through an Analysis of Postschool Follow-Up Data

James R. Thompson

*Department of Special Education
Illinois State University*

Kevin S. McGrew

Institute for Applied Psychometrics

David R. Johnson and Robert H. Bruininks

University of Minnesota

The integration and participation of persons with disabilities in community life has emerged as a primary guiding value of contemporary policies and practices for people with disabilities. As a result, the development of models of community adjustment has been the focus of recent research. Survey data were collected on the life experiences and status of 388 young adults with disabilities who had been out of school for 1 to 5 years. Five alternative community adjustment measurement models and a null model were evaluated in separate model development and cross-validation samples. The results, paired with findings from prior research, support a 7-factor model of community adjustment. Implications and recommendations are provided for future research regarding the development and validation of measures and multidimensional models of community adjustment for persons with disabilities.

Although there are many different perspectives on what constitutes a good quality of life for individuals with and without disabilities (cf. Hughes, Hwang, Kim, Eisenman, & Killian, 1995; Parmenter, 1992; Schalock, 1996), there is widespread consensus that

quality of life is inextricably linked to having opportunities to participate in all aspects of community life. For the past 40 years, public-policy and service-delivery approaches in the disability field have been based on the premise that it is desirable to involve children, youth, and adults with disabilities in the same settings and activities that are accessed by the majority of the population. Seemingly divergent practices such as supported employment, barrier-free architectural design, and the provision of specialized accommodations in postsecondary education programs all share the common goal of promoting greater participation in community life. Currently, program models and services that result in separation and limited involvement in community life by persons with disabilities are generally considered to be undesirable.

Despite the prevailing interest in supporting persons with disabilities in community settings and activities, there is little agreement on how to measure the extent of a person's community adjustment. Much of the community adjustment research has been criticized for an excessive reliance on single outcome variables. Although unidimensional outcome measures provide important descriptive information, they do not accurately capture the rich and complex nature of community adjustment (Heal, 1985; McGrew & Bruininks, 1994; Zetlin, 1988). Furthermore, the wide array of indicators used by different researchers has made it difficult to synthesize research findings (Halpern, 1990). A multidimensional framework for conceptualizing and measuring community adjustment is needed to establish an appropriate foundation for research, evaluation, and quality improvement efforts. The purpose of this study was to compare competing multidimensional measurement models of community adjustment in order to expand and extend a systematic program of research aimed at identifying empirically valid community adjustment domains.

PRIOR EFFORTS TO MEASURE COMMUNITY ADJUSTMENT

For years a variety of community adjustment measures have been used to examine diverse topics such as the effects of deinstitutionalization (e.g., Bijou, Ainsworth, & Stockey, 1943), the success of community-based adult training programs (e.g., Schalock & Lilley, 1986), and the outcomes of special education services (e.g., Wagner, Blackorby, Cameto, & Newman, 1993). Findings from many of these investigations have often been analyzed and presented in a dichotomous manner. Numerous tables are often used to cross a wide variety of variables. For example, one table may compare the number of hours that individuals work to their disability classification, another table may compare wages earned per hour by gender, and a third table may indicate the percentage of people living outside of the family home. The possibilities for cross-tabulation are limited solely by the number of variables that are collected.

Perhaps no set of studies better illustrates the limitations of univariate, descriptive community adjustment measures than the investigations that have focused on the life experiences of former students who received special education while in high school. These studies have been conducted for more than 60 years (e.g., Baller, 1936; Blackorby & Wagner, 1996; Halpern, 1973; Hasazi, Gordon, & Roe, 1985; Kennedy, 1948; McFall,

1966; Saenger, 1957). Although these investigations have provided interesting descriptive information, it is clear that additional data has yielded diminishing returns. McGrew and Bruininks (1994) observed that dichotomous descriptions of outcome data make “it difficult for researchers and the consumers of the research to see the forest from the trees as extensive and detailed descriptive summaries often overwhelm even the most careful reader” (p. 67). They maintained that a multivariate approach to reporting outcome findings would be more useful in terms of guiding professional practice, future research, and policy decision making. Kerlinger (1986) summarized the rationale for basing research efforts on a multivariate approach by asserting that “multivariate methods ... mirror the actual complexity of behavioral reality” (p. 524).

TOP-DOWN AND BOTTOM-UP MODELS OF COMMUNITY ADJUSTMENT

Several multidimensional models of community adjustment have been presented in the past. These can be roughly divided into two categories: models developed through the “bottom-up” approach and models developed through the “top-down” approach. In bottom-up models, a variety of status variables are grouped into different categories to provide an organizing structure for the presentation of descriptive data or clustering of curricular goals. Bottom-up models begin with either a review of outcome variables investigated in prior research or consideration of life skills needed to function in the community. They culminate in the formation of multidimensional domains through a logical and, in some cases, statistical analysis. Models presented by Brolin (1995); Bruininks, Morreau, Gilman, and Anderson (1991); Cronin and Patton (1993); Dever (1988); Smith and Schloss (1988); and DeStefano and Wagner (1992) are examples of bottom-up models.

In contrast to the bottom-up approach, several researchers have developed multidimensional models of community adjustment through a top-down approach. “The top-down approach starts with the question: ‘regardless of what variables are currently included in current research studies, what needs to be included to build a comprehensive ideal conceptual model?’” (McGrew & Bruininks, 1994, p. 68). Halpern (1993) and Ysseldyke et al. (1992) proposed top-down models, although both models focus on community adjustment domains within broader contexts. Ysseldyke et al.’s model focused on educational outcomes, whereas Halpern’s focused on the quality of life construct.

Community adjustment models emerging from the bottom-up and top-down approaches provide a reasonable means by which to conceptually organize a body of outcome data. However, the mere specification of a model does not guarantee valid measurement of the model components. Heal (1985) warned that arbitrarily employing operational measures to index abstract constructs “constitutes a logical flaw that threatens the validity of most social science research” (p. 211) and asserted that developing empirically valid measures is essential to efforts to scientifically investigate the interrelations of variables. Fortunately, the statistical procedures of exploratory and confirma-

tory factor analysis enable researchers to build scientifically valid multivariate measurement models that serve as the operational foundation for theoretical modeling.

FACTOR ANALYSIS: A PRIMARY MODEL-BUILDING TOOL

Factor analysis procedures contribute to model building primarily through the identification of the underlying model dimensions and the evaluation of the validity of potential measures (indicators) of the dimensions. "Factor analysis is based on the premise that there are variables of theoretical interest that cannot be directly observed. Information concerning unobservable variables, which are typically referred to as latent factors or common factors, must be obtained indirectly by examining their effects on observed variables" (Thompson, McGrew, & Bruininks, 1999, p. 18). Because it is assumed that covariation among observed variables (e.g., satisfaction rating scale items) is due to a latent factor(s) that the observed variables have in common (e.g., Personal Satisfaction), factor analytic procedures can be used to reduce a large set of correlated, observed variables to a small set of latent factors. According to Harman (1976), the chief aim of factor analysis is to "attain scientific parsimony or economy of description" (p. 4). Factor analytic procedures yield the precise amount of variance that a model explains and does not explain (Harman, 1976) and have been used to identify the underlying structure of a wide variety of constructs, including intelligence (Carroll, 1993), adaptive behavior (Thompson et al., 1999), anxiety (Shevlin & Lewis, 1999), and job satisfaction (Law & Wong, 1999), to name a few.

Factor analytic procedures are typically divided into exploratory and confirmatory approaches. Exploratory methods are useful in the early or formative stages of theory building and measurement development because they provide a means by which to investigate the structure within a set of indicators when there is little basis for hypothesizing the parameters of a model (Jöreskog & Sörbom, 1993a). For example, exploratory procedures were used in early work investigating the factor structure of intelligence (e.g., Thurstone, 1938) and adaptive behavior (Nihira, 1969). Researchers who utilize exploratory procedures must be aware of the possibility of producing an arbitrary solution due to the atheoretical nature of exploratory methods. Models generated from exploratory procedures eventually should be tested by confirmatory methods.

Confirmatory methods are used when investigators have a theoretical and research base by which to hypothesize one or more specific factor structures based on a set of indicators. Long (1983) reported that confirmatory procedures require researchers to specify any or all of the following four restrictions prior to data analysis: "(1) which pairs of common factors are correlated, (2) which observed variables are affected by which common factors, (3) which observed variables are affected by a unique factor, and (4) which pairs of unique factors are correlated" (p. 12). Researchers decide which restrictions to impose based on hypotheses developed through a review of prior research or theory; more restrictions will result in a more rigorous test. Confirmatory procedures yield a variety of statistical tests that indicate the extent to which data are consistent with a hypoth-

esized model (Long, 1983). Confirmatory procedures are best suited to the late or summative stages of model development research.

TESTING A COMMUNITY ADJUSTMENT MODEL

This study contributes to a growing body of conceptual and empirical work directed at identifying reliable and valid multidimensional measures and models of community adjustment. It was specifically designed to build and expand on a sequence of research studies completed at the University of Minnesota in the late 1980s and early 1990s (Bruininks, Chen, Lakin, & McGrew, 1992; Bruininks, Thurlow, McGrew, & Lewis, 1990; McGrew, Bruininks, Thurlow, & Lewis, 1992; McGrew, Johnson, & Bruininks, 1994). McGrew and Bruininks (1994) reported that an initial community adjustment model was established through a combination of the top-down and bottom-up approaches discussed earlier. Based on findings from investigations using four different data sets, McGrew and Bruininks concluded there was empirical support for the following eight dimensions of community adjustment: Personal Satisfaction (satisfaction with life activities), Employment Stability (job stability and job satisfaction), Employment-Economic Integration (integrated employment and economic self-sufficiency), Recreation/Leisure Integration (participation in recreation and leisure activities), Residential Integration (community integration and independent living), Social Network Integration (social support system), Community Assimilation and Acceptance (involvement with and acceptance by others), and Need for Support Services (need for extraordinary supports).

In this investigation, confirmatory factor analytic procedures were applied to data from a postschool follow-up study of 388 young adults with disabilities to refine, evaluate, and cross-validate the multidimensional community adjustment measurement model presented by McGrew and Bruininks (1994). The research questions driving this investigation were the following: (a) Which of four multidimensional models of community adjustment, all based on prior research, is best supported by community adjustment data that was collected on a sample of young adults with disabilities? (b) Will a model generated through exploratory factor analysis of data from half of the sample have a latent factor structure that is the same as one of the four a priori models? (c) If an exploratory model with a different latent factor structure emerges from an exploratory analysis on data from one half of the sample, will the exploratory model be supported (i.e., cross-validated) by data from the other half of the sample? (d) Is a null model (i.e., a model that assumes no covariation among indicator variables and has no latent factors) better supported by data than the best fitting a priori model or the exploratory model?

METHOD

Sample

The sample consisted of 388 young adults with disabilities in Minnesota who had been out of high school from 1 to 5 years. The mean age of the sample was 21.6 years ($SD = 1.9$;

range = 17.9–27.8). Descriptive characteristics and response rates for the initial and final samples are summarized in Table 1.

Sample selection occurred in two phases. In the first phase, 193 youth with a primary disability of learning disability, mild mental retardation, emotional or behavior disorder, or moderate or severe mental retardation were selected. At the time of sample selection, these individuals were enrolled in a school district in a metropolitan community or a school district in a midsized city. All individuals were scheduled to graduate from school within the next 2 to 4 years. Two to 4 years after the initial sample was identified, 112 postschool follow-up interviews were completed 1 to 2 years after the individuals had last attended school.

A quasi-random sampling procedure was used in the second phase of the sample selection process. As part of a follow-up study initiated by the Minnesota Department of Education (Thompson, Lin, Halpern, & Johnson, 1994), 11 communities (including the 2 from Phase 1 of data collection) were identified based on their diverse geographical distribution within the state. Young adults from these communities who met the following criteria were included in the pool from which this sample was to be selected: (a) The former student must have been out of school for at least 1 year but not more than 5 years; (b) the school needed to have a phone number or an address for the former student; and (c) the former student needed to have been classified as having a primary disability of learning disability, emotional or behavioral disorder, mild mental retardation, or moderate or severe mental retardation during the year he or she last attended school. Potential participants within each disability group were further divided by gender. A maximum

TABLE 1
Response Rates by Community Type, Disability Classification, Gender, and Sample Selection Phase

<i>Characteristic</i>	<i>Number of Interviews Attempted</i>	<i>Number of Interviews Completed</i>	<i>% of Response Rate</i>
Community			
Metropolitan	226	120	53
Midsized city	245	142	58
Rural	234	126	54
Disability			
Learning disability	278	148	54
Emotional/behavior disorder	134	55	41
Mild mental retardation	165	95	57
Moderate/severe mental retardation	128	90	70
Sex			
Male	409	227	55
Female	296	161	54
Sample selection phase			
Phase 1	193	112	58
Phase 2	512	276	54
Total	705	388	55

Note. Communities were labeled by population size as either metropolitan (over 2 million), midsized city (between 60,000 and 100,000), or rural (less than 20,000).

number of youth from each disability by gender group were identified from each community for selection in the sample. The table of random numbers was used to select 512 former students for follow-up interviews in Phase 2 of the sample selection process. Interviews were completed on 276 individuals.

The overall contact rate of 55% (388 of 705) is sufficient for drawing conclusions from postschool follow-up data (Bruininks, Wolman, & Thurlow, 1990). In contrast to the consistency of the contact rates for region and gender, the rates varied considerably for participants in the four disability groups. Although the 41% contact rate for the emotional or behavioral disorder group was disappointing, it was not surprising. Previous follow-up studies of young adults with emotional or behavior disorder have consistently reported difficulty contacting participants (e.g., see Leone, 1984; Neel, Meadows, Levine, & Edgar, 1988; Wagner, D'Amico, Marder, Newman, & Blackorby, 1992). The Carson, Sitlington, and Frank (1995) study was the only one found in which a contact rate greater than 50% was reported.

Data Collection Procedures

Interviewers used a scripted interview survey to collect data. The survey was the fourth revision of an instrument developed at the University of Minnesota over a 10-year period. The original survey was based on input from (a) a survey of practitioners nationwide about follow-up information considered important for programs to have to plan for the needs of students receiving special education; (b) a review of instruments used by other postschool follow-up projects in the United States; and (c) a task force of school district officials (Thurlow, Bruininks, & Lange, 1989).

Interviewers were trained in data-collection procedures by the project coordinators and the principal investigator. Training included a presentation of guidelines for effective interviewing, a review of the survey instrument, and a mock interview. Additionally, interviewers were provided with materials that included explicit instructions for initiating and conducting the interviews. Interviews took between 15 and 30 min to complete. Ninety-five percent were completed over the telephone, with the remaining interviews completed in person (i.e., face to face). The participants themselves were the primary sources of information for those with learning disabilities (82%), emotional or behavioral disorders (69%), and mild mental retardation (71%). Parents (56%) were the most common respondents for young adults with moderate or severe disabilities.

Data Analysis

Construction and screening of variables. Composite indicator variables were constructed from the postschool interview survey data in a manner similar to the process described by McGrew et al. (1992, 1994). Although 13 variables used the exact same survey items and combinations of data as was used by McGrew et al. in the previous studies, 8 variables were constructed slightly differently to provide a more meaningful and valid data set (i.e., the survey items were either worded differently to enhance clarity, the com-

bination of data sources was slightly modified, or both survey items and data sources were changed). One new variable was added consisting of data that was not collected by McGrew et al. (1992, 1994). Table 2 provides a description of each indicator variable and its composition related to McGrew et al.'s studies.

The adequacy of the indicators for use in a confirmatory factor analysis study was assessed using the PRELIS (Version 2.0; Jöreskog & Sörbom, 1993a) computer program, a preprocessor program for the LISREL structural equation modeling program. Data screening involved examining (a) the amount and pattern of missing data, (b) the sum-

TABLE 2
Indicator Variable Descriptions

<i>Variable</i>	<i>Description</i>
Friendship Satisfaction ^a	Likert scale item (1–4) measuring satisfaction with friendships
Recreation/Leisure Satisfaction ^a	Likert scale item (1–4) measuring satisfaction with recreation and leisure activities
Living Arrangement Satisfaction ^a	Likert scale item (1–4) measuring satisfaction with living arrangements.
Daytime Activity Satisfaction ^a	Likert scale item (1–4) measuring satisfaction with daytime activities.
Number of Jobs ^b	Number of different jobs held per year since leaving high school.
Percentage of Time Employed ^b	Percentage of time employed since leaving high school.
Length of Employment ^b	Longest continuous time (months) employed at the same job.
Employment Benefits ^a	Number of six possible benefits received on current job.
Hours Worked per Week ^a	Number of hours worked during a typical week.
Earned Income ^a	Gross pay earned during a typical week.
Daily Activity ^b	Participant's primary vocational or training activity (scaled 1–5).
Economic Independence ^b	Extent to which a participant independently uses and manages personal income (scaled 0–8).
Income Support ^b	Amount of monthly income received from public sources.
Formal Support Services ^c	Number of support services used involving paid staff.
Recreation/Leisure–Formal and Community ^a	Number of recreation/leisure activities involving community or public facilities in which a person participated during the past week.
Recreation/Leisure–Informal and Home ^b	Number of unstructured recreation/leisure activities within the home in which the person was engaged during the past week.
Recreation/Leisure–Social ^b	Number of recreation/leisure activities involving an active participation with others in which the person participated during the past week.
Number of Friends ^a	Number of friends (not relatives) identified as part of the individual's social network.
Number of Immediate Family ^a	Number of immediate family members identified as part of the individual's social network.
Number of Extended Family ^a	Number of extended family members identified as part of the individual's social network.
Number of Staff and Professionals ^a	Number of staff and professionals identified as part of the individual's social network.
Living Arrangements ^a	Extent to which the individual lives independently in the community (scaled 1–4).

^aVariable was constructed exactly the same way as McGrew et al. (1992, 1994). ^bVariable was constructed slightly differently than McGrew et al. (1992, 1994). ^cVariable was not included in research completed by McGrew et al. (1992, 1994).

TABLE 3
Descriptive Statistics for Indicator Variables

<i>Variable</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Scale</i>
Friendship Satisfaction	367	3.52	0.72	Ordinal
Recreation/Leisure Satisfaction	378	3.47	0.89	Ordinal
Living Arrangement Satisfaction	386	3.42	0.79	Ordinal
Daytime Activity Satisfaction	369	3.27	0.78	Ordinal
Number of Jobs	387	0.99	0.81	Interval
Percentage of Time Employed	387	74.95	34.90	Interval
Length of Employment	386	18.95	17.67	Interval
Employment Benefits	386	1.21	1.53	Ordinal
Hours Worked per Week	388	25.61	18.78	Interval
Earned Income	378	133.26	153.39	Interval
Daily Activity	388	3.87	1.46	Ordinal
Economic Independence	365	4.39	2.16	Ordinal
Income Support	341	4880.77	204.07	Interval
Formal Support Services	371	1.73	1.98	Ordinal
Recreation/Leisure–Formal and Community	379	1.64	1.29	Ordinal
Recreation/Leisure–Informal and Home	378	5.01	1.34	Ordinal
Recreation/Leisure–Social	383	2.45	1.18	Ordinal
Number of Friends	374	2.78	2.80	Interval
Number of Immediate Family	374	2.70	2.06	Interval
Number of Extended Family	374	0.62	1.22	Interval
Number of Staff and Professionals	375	0.51	0.91	Interval
Living Arrangements	388	3.93	1.15	Ordinal

mary statistics for continuous variables, (c) the test for univariate normality for continuous variables, (d) the test of multivariate normality for continuous variables, and (e) the frequency or histograms for all variables.

Inspection of missing data revealed that 126 (32%) of the participants were missing data on one or more indicator variables. Because missing data can be problematic in multivariate analyses, data for four indicators (Satisfaction with Friendships, Satisfaction with Daytime Activities, Income Support, and Economic Independence) were imputed. The PRELIS imputation procedure (Jöreskog & Sörbom, 1993a), a correlational procedure that substitutes a value for a missing value for a case with that from another case that has a similar response pattern over a set of matching variables, was used. The imputation procedure recovered data for 61 participants. In the final sample ($n = 323$), only 1% of the data were imputed; 18% were recovered (i.e., these data would have been discarded if the imputation procedure had not been used); and 81% were original data. The ratio of recovered to imputed data was substantial (i.e., 18:1), a situation that justifies the use of data imputation procedures (Raymond, 1987; Raymond & Roberts, 1987).

Table 3 presents the descriptive statistics for the 22 indicator variables. Summary screening statistics (skew, kurtosis, or frequency histograms) revealed that 9 interval variables and 11 ordinal variables had distributions that were markedly skewed and nonnormal. Based on the guidelines provided by Tabachnick and Fidell (1989), the in-

verse, logarithmic, and square root transformations were applied to interval scaled variables in an attempt to improve normality. However, these transformations did not improve the normality of the distributions, and the variables were retained in their original form. Two of the ordinal variables (Number of Immediate Family, Number of Extended Family) were discarded as they were highly skewed and displayed little shared variance with the other indicators.

The degree of nonnormality associated with 18 of the 20 remaining variables indicated that the assumption of multivariate normality was not met in this study. Jöreskog and Sörbom (1986) reported that the use of confirmatory factor analysis in such cases requires caution when evaluating the *absolute* level of model fit and the inferential statistical results. However, when researchers are interested in the *relative* fit of competing models (as was the case in this study), variables with moderately to highly nonnormal distributions can still be used.

Analytic strategies. The complete sample was randomly divided into two groups: a model development sample ($n = 161$) and a cross-validation sample ($n = 162$). The standard confirmatory factor analysis steps of model specification, estimation, evaluation, and readjustment (Bollen & Long, 1993; Horn & McArdle, 1980) guided the analysis. In addition, exploratory factor analysis was employed using data from the model development sample to determine if a reasonable alternative model would emerge for comparison with the four a priori models.

Because there is no consensus regarding which goodness-of-fit statistics to use from the large number that are available (Tanaka, 1993), multiple-fit statistics were used to evaluate the different models. Specifically, chi-square statistics, the Parsimonious Goodness-of-Fit Index, the standardized root mean square residual, the Goodness-of-Fit Index, and the Adjusted Goodness-of-Fit Index (see Hayduk, 1987; Jöreskog & Sörbom, 1993c; Loehlin, 1987; Tanaka, 1993) were inspected.

Loehlin (1987) reported that the ratio of the chi-square value to its degrees of freedom provides a useful rough index of the fit of competing models. In essence, the chi-square statistic is a *poorness-of-fit* measure because larger values indicate poorer fit (Jöreskog & Sörbom, 1993c). The chi-square to *df* ratio and the Parsimonious Goodness-of-Fit Index are from a family of parsimony fit indexes that penalize models that have a large number of parameters in favor of simpler models. Unlike the chi-square/*df* ratio, larger Parsimonious Goodness-of-Fit Index statistics indicate better fitting models (Tanaka, 1993).

Cole (1987) reported that standardized root mean square residuals below .10 reflect a good fit between a model and data. The Goodness-of-Fit Index and Adjusted Goodness-of-Fit Index statistics, which are analogous to the multiple and adjusted multiple correlation in regression analyses (Tanaka, 1993), provide norm values between 0 and 1, with 1.0 being a perfect fit and .00 indicating that there is no relation whatsoever between a factor structure (i.e., model) and sample data. Goodness-of-Fit Indexes above .90 and Adjusted Goodness-of-Fit Indexes above .80 are indicative of a good fitting model (Cole, 1987).

In Phase 1, an exploratory model (Model 5.0) was developed through principal components factoring followed by varimax rotation using data from the model development sam-

ple ($n = 161$). A combination of objective (viz., eigenvalues greater than one; scree test) and subjective (viz., interpretability of factors) factor extraction criteria were employed to identify a model of best fit. In Phase 2, four a priori models (Models 1.0 through 4.0) that were based on a review of five prior community adjustment structural modeling studies (i.e., Bruininks et al., 1992; Bruininks, Thurlow, et al., 1990; Halpern, Nave, Close, & Nelson, 1986; McGrew et al., 1992, 1994), a null model, and the exploratory model (Model 5.0) were tested using data from the model development sample ($n = 161$). Confirmatory factor analysis with the maximum likelihood fitting function (i.e., maximum likelihood method) in the LISREL computer program (Jöreskog & Sörbom, 1993b) was used. Figure 1 shows the variables that load on different factors associated with the models tested in Phase 2. A single correlated error parameter was included in each model to account for the

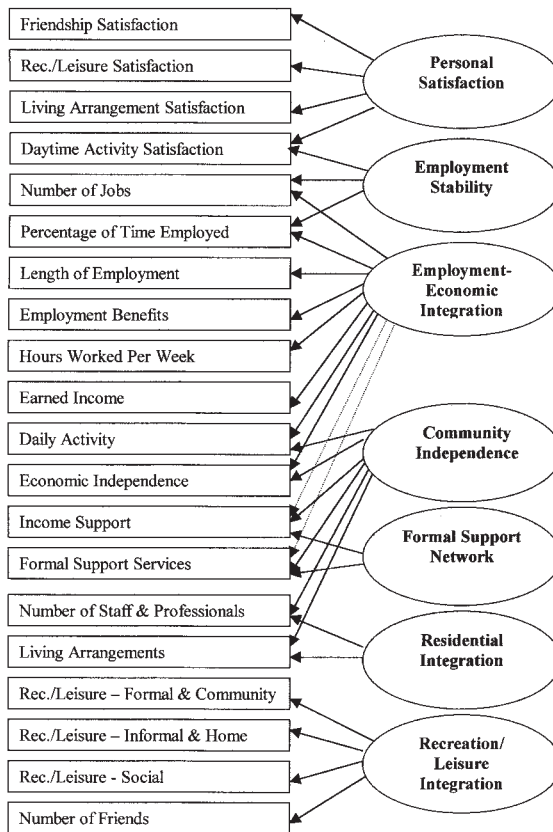


FIGURE 1 Factors with white backgrounds were included in all five models tested in Phase 2 of the data analysis. The Employment Stability factor was included in Models 1.00, 4.00, and 5.00. The Community Independence factor was included in Model 5.00. The Formal Support Network factor was included in Models 3.00 and 4.00. The Residential Integration factor was included in Models 1.00, 2.00, 3.00, and 4.00. In Models 1.00, 4.00, and 5.00 the variables Income Support and Formal Support Services did not load on the Employment-Economic Integration factor.

use of common variables in the construction of the Earned Income and Hours Worked per Week indicators. For the purpose of clarity and readability, arrows denoting latent factor correlations and residual parameters are not included in Figure 1.

In Phases 3 and 4 of the data analysis, three respecified models from Phase 2 were tested. The LISREL output was used together with logical analysis to identify model parameters to delete or add to the best fitting models. New model parameters were added only if they made logical or theoretical sense.

In Phase 5, the three best fitting respecified models were evaluated using data from the cross-validation sample. Examination of the cross-validation covariance matrix revealed a nonpositive definite matrix (also referred to as a nondefinite matrix). This precluded the use of the maximum likelihood fitting function. Three options (*viz.*, ridge option, discarding variables, use alternative estimation algorithm), as suggested by Wothke (1993), were explored for addressing the nondefinite matrix problem. The use of an alternative estimation algorithm was determined to be the most viable option. The unweighted least squares algorithm, an algorithm that does not require a positive definite covariance matrix, was used in lieu of the maximum likelihood method in the cross-validation sample. Although the maximum likelihood estimation method has slightly better statistical properties (*i.e.*, more stable estimators of population parameters; Loehlin, 1987), the unweighted least squares method is a credible procedure for completing factor analysis (Harman, 1976; Jöreskog & Sörbom, 1993c; Kim & Mueller, 1978b). Because fit statistics from maximum likelihood and unweighted least squares method are not directly comparable (Loehlin, 1987), an additional phase of data analysis was initiated. In Phase 6 the final models identified in the model development sample were reanalyzed using the unweighted least squares method so the results from the two subsamples could be meaningfully compared.

RESULTS

The Phase 1 exploratory analysis revealed five eigenvalues greater than one, which suggested that at least five factors were present. The scree test suggested the presence of five to six factors. The five-, six-, and seven-factor solutions were reviewed. The five-factor model was considered to present the most meaningful representation of the data. This model was substantially different from the four a priori models due to the emergence of a Community Independence factor. This factor incorporated variables associated with the Residential Integration, Formal Support Network, and Employment–Economic Integration dimensions in the a priori models and had not emerged in prior structural modeling studies. Community Independence was defined as the extent to which individuals function independently in their communities with limited support from paid service providers.

The model fit statistics for the six models (*i.e.*, four a priori, exploratory, and null models) evaluated in Phase 2 are summarized in Table 4. The fit indexes and a review of each model's parameters indicated that Models 3.00 and 5.00 were the most plausible models. Table 4 also shows the results of Phase 3 of the analysis, in which two respecified versions of Model 3.00 (Model 3.10 and 3.20) and one respecified version of Model 5.00 (Model 5.10) were developed and tested. The goodness of fit of Model 5.10 and Model 3.20 were virtually identical. Although the differences were not extreme, all five indexes showed Models 5.10 and 3.20 to be better fitting models than Model 3.10.

Model 3.11, a respecified version of Model 3.10, was tested in Phase 4 of the analysis. As the fit statistics in Table 4 reveal, the relative fit of Model 3.11 improved sufficiently to warrant inclusion in subsequent phases of this study. The differences in the fit statistics of Model 3.11 and Models 3.20 and 5.11 were all within one hundredth to two one hundredths of a point. These differences were so small that all three models were considered to be equally plausible.

Phase 5 of the analysis involved testing the three best fitting models (Models 3.11, 3.20, and 5.10) using data from the cross-validation sample. The results of this analysis are also shown in Table 4. The cross-validation sample data generated virtually identical fit statistics for Models 3.11 and 3.20 but did not support Model 5.10 at all. The biggest problem with Model 5.10 stemmed from the Community Independence dimension. Not surprisingly, this dimension was the one dimension that was unique to Model 5.10 and had not emerged in prior model-building studies. The three indicators that had been associated solely with the Employment–Economic Integration Dimension (i.e., daily activity, economic independence, and earned income) in prior research studies simply did not have any relation to the other indicators comprising the Community Independence factor of Model 5.10.

The final phase of analysis, Phase 6, involved applying the unweighted least squares estimation method to data from the model development sample. As is apparent in Table 4, all three models fit data from the model development sample better than data from the cross-validation sample. This was not surprising because the three models were in effect “tailored” to the model development sample data through the exploratory factoring and model respecification processes. The key finding is that the relative fit of Models 3.11

TABLE 4
Summary of Fit Indexes for Data Analysis Phases 2 Through 6

<i>Analysis Phase</i>	<i>Model</i>	χ^2/df	<i>RMR</i>	<i>GFI</i>	<i>AGFI</i>	<i>PGFI</i>
Phase 2	1.00 ^a					
Phase 2	2.00	675.82/163	.12	.71	.63	.55
Phase 2	3.00	591.51/159	.11	.75	.67	.57
Phase 2	4.00 ^a					
Phase 2	5.00	497.68/153	.10	.78	.70	.57
Phase 2	Null	1434.73/190	.24	.45	.39	.41
Phase 3	3.10	608.14/163	.12	.74	.67	.58
Phase 3	3.20	514.03/159	.10	.78	.71	.59
Phase 3	5.10	471.80/158	.11	.79	.73	.60
Phase 4	3.11	523.65/161	.11	.77	.70	.59
Phase 5	3.11	602.43/161	.13	.86	.82	.66
Phase 5	3.20	566.22/159	.13	.87	.83	.66
Phase 5	5.10 ^a					
Phase 6	3.11	371.21/161	.11	.90	.86	.69
Phase 6	3.20	339.04/159	.10	.90	.87	.69
Phase 6	5.10	356.38/158	.10	.90	.87	.68

Note. RMR = root mean square residual; GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index; PGFI = Parsimonious Goodness-of-Fit Index.

^aFit statistics were not generated because the model did not converge after 300 iterations.

and 3.20 are virtually identical in both samples, whereas Model 5.10 was not supported at all by cross-validation sample data.

The two models of best fit are shown in Figure 2. Inspection of estimated parameter values (i.e., residual variance, correlated error, factor loadings, and latent factor correlations) that were derived from the unweighted least squares estimator (i.e., parameters emerging in Phases 5 and 6 of the data analysis process) revealed a similar pattern across the two samples (see Tables 5 and 6). Indicator variables with relatively large factor loadings in the model development sample solution also tended to have relatively large factor loadings in the cross-validation sample solution. Additionally, latent factor correlations and residual variance tended to be similar in the solutions that were generated from these two independent samples.

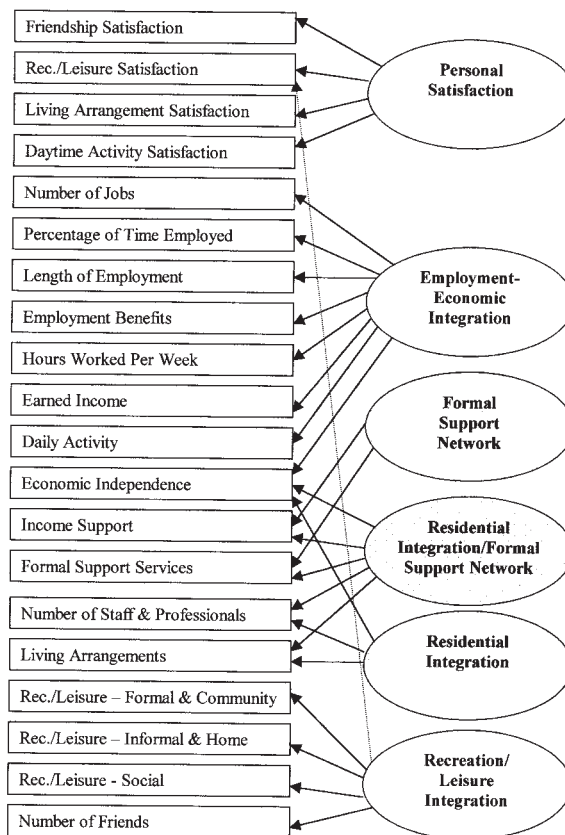


FIGURE 2 Factors with white backgrounds were included in Models 3.11 and 3.20. The Residential Integration/Formal Support Network factor (dotted background) was included in Model 3.11 but not in Model 3.20. The Residential Integration and Formal Support Network factors (striped backgrounds) were included in Model 3.20 but not in Model 3.11. In Model 3.20 the Recreation/Leisure Satisfaction variable did not load on the Recreation/Leisure Integration factor.

TABLE 5
Parameter Estimates for Model 3.11

Variable	Latent Factor Loadings ^a				Residuals
	PS	EEI	RFISN	RLI	
Friendship Satisfaction	.96 (.74)				.08 (.45)
Recreation/Leisure Satisfaction	.57 (.53)			.31 (.27)	.42 (.57)
Living Arrangement Satisfaction	.41 (.15)				.83 (.98)
Daytime Activity Satisfaction	.27 (.39)				.93 (.86)
Number of Jobs		.34 (.36)			.89 (.87)
Percentage of Time Employed ^b		.48 (.45)			.77 (.80)
Length of Employment ^b		.32 (.24)			.90 (.94)
Employment Benefits		.59 (.70)			.65 (.51)
Hours Worked per Week ^c		.74 (.84)			.45 (.29)
Earned Income per Week ^c		.74 (.90)			.45 (.19)
Daily Activity		.96 (.99)			.09 (.03)
Economic Independence		.37 (.49)	-.45 (-.27)		.53 (.52)
Income Support		.33 (.06)	-.31 (-.74)		.71 (.40)
Formal Support Services			.97 (.82)		.06 (.33)
Number of Staff and Professionals			.49 (.43)		.77 (.81)
Living Arrangements			-.56 (-.78)		.70 (.40)
Number of Friends				.38 (.50)	.86 (.76)
Recreation/Leisure-Formal and Community				.58 (.60)	.66 (.64)
Recreation/Leisure-Informal and Home				.48 (.53)	.77 (.72)
Recreation/Leisure-Social				.56 (.65)	.69 (.58)

Note. PS = Personal Satisfaction; EEI = Employment-Economic Integration; RFISN = Residential Integration/Formal Support Network; RLI = Recreation/Leisure Integration.

^aParameter estimates outside of the parentheses were derived from data from the model development sample; values within the parentheses were derived from cross-validation sample data; ^bCorrelated residuals for Percentage of Time Employed and Length of Employment was .43 for the model development sample and .40 for the cross-validation sample; ^cCorrelated residuals for Hours Worked per Week and Earned Income was .15 for the model development sample and .08 for the cross-validation sample.

The fit of the respecified exploratory model to the cross-validation sample data was so poor that the model did not converge. These results suggested that the emergence of the Community Independence factor in the exploratory model was the result of measurement or sampling error (i.e., an artifact of the model development sample data) and clearly illustrated the limitations of relying solely on exploratory factoring procedures to identify structural models. Results also indicated the rejection of the null model (i.e., a model that assumes no covariation among indicator variables and has no latent factors) and provided strong evidence that a latent factor structure underlies the 20 outcome indicators of community adjustment that were investigated. Results also revealed that correlations among community adjustment factors were either nonexistent or moderate for the two models of best fit (i.e., Models 3.20 and 3.11). This finding supported previous research that indicated different dimensions of community adjustment were independent of one another (cf. Bruininks et al., 1992; Bruininks, Thurlow, et al., 1990; Halpern et al., 1986; McGrew et al., 1992, 1994).

TABLE 6
Parameter Estimates for Model 3.20

Variable	Latent Factor Loadings ^a					Residuals
	PS	EEI	FSN	RLI	RI	
Friendship Satisfaction	.92 (.74)					.15 (.46)
Recreation/Leisure Satisfaction	.74 (.63)					.45 (.61)
Living Arrangement Satisfaction	.41 (.11)					.83 (.99)
Daytime Activity Satisfaction	.25 (.34)					.94 (.89)
Number of Jobs		.34 (.36)				.89 (.87)
Percentage Time Employed ^b		.48 (.45)				.77 (.80)
Length of Employment ^b		.31 (.25)				.90 (.94)
Employment Benefits		.59 (.70)				.65 (.51)
Hours Worked per Week ^c		.75 (.85)				.44 (.29)
Earned Income per Week ^c		.75 (.90)				.44 (.19)
Daily Activity		.95 (.99)				.10 (.02)
Economic Independence		.42 (.45)			.50 (.39)	.48 (.48)
Income Support			.63 (.78)			.61 (.40)
Formal Support Services			-.90 (-.80)			.19 (.37)
Recreation/Leisure-Formal and Community				.52 (.44)		.73 (.80)
Recreation/Leisure-Informal and Home				.40 (.40)		.89 (.84)
Recreation/Leisure-Social				.59 (.61)		.65 (.63)
Number of Friends				.46 (.74)		.79 (.45)
Number Staff and Professionals					-.56 (-.50)	.69 (.75)
Living Arrangements					.66 (.90)	.57 (.18)

Note. PS = Personal Satisfaction; EEI = Employment-Economic Integration; FSN = Formal Support Network; RLI = Recreation/Leisure Integration; RI = Residential Integration.

^aParameter estimates outside of the parentheses were derived from data from the model development sample; values within the parentheses were derived from cross-validation sample data; ^bCorrelated residuals for Percentage of Time Employed and Length of Employment was .43 for the model development sample and .39 for the cross-validation sample; ^cCorrelated residuals for Hours Worked per Week and Earned Income was .15 for the model development sample and .08 for the cross-validation sample.

The key difference between the models of best fit concerned the Residential Integration and Formal Support Network factors. The five-factor model (Model 3.20) supported the independence of these two dimensions, whereas the four-factor model (Model 3.11) combined them into one dimension. Model 3.11 was the more parsimonious model because it included only four factors. Harman (1976) stated that "parsimony is one of the fundamental standards in selecting a preferred solution" (p. 280). Whenever alternative models are equally plausible on a conceptual and empirical basis, the more parsimonious model should be chosen (Harman, 1976; Kim & Mueller, 1978a).

On closer consideration of these models, however, it did not appear that they were equally defensible based on conceptual criteria. Model 3.20, which separated the Formal

Support Network and Residential Integration dimensions, was found to be conceptually superior because the two dimensions clearly represent fundamentally different constructs and measures. Residential Integration is what Schalock (1990) described as a "Social Indicator," whereas Formal Support Network is best conceptualized as what Ysseldyke et al. (1992) referred to as an "Enabling Outcome." Social Indicators reflect external, environmentally based conditions that are influenced by Enabling Outcomes. In regard to these two factors, the extent to which individuals are part of an appropriate Formal Support Network should influence the degree to which they experience a positive Residential Integration. Model 3.20, with separate Residential Integration and Formal Support Network dimensions, was empirically and conceptually the strongest model tested in this investigation.

Goodness-of-fit statistics for Model 3.20 were slightly below the standard that is indicative of a good model fit. Slightly "poorer than acceptable" fit statistics were also reported by McGrew et al. (1992) in the other community adjustment model-building study reporting goodness-of-fit statistics. They concluded that model fit may have been improved had more sensitive measures been collected and pointed out that their final community adjustment model was very restrictive in the sense that none of the indicator variables were factorically complex (i.e., no variable loaded on more than one factor). Factorically complex indicators tend to account for more variance and therefore generate better fit statistics. However, models that contain too many factorically complex indicators violate the principle of parsimony (Harman, 1976).

The same reasons for less than acceptable fit statistics in the McGrew et al. (1992) study would apply to this investigation. Although more sensitive measures were developed for this study, the nature and range of indicators to define community adjustment dimensions requires refinement and expansion. Also, the final model in this study (Model 3.20) is restrictive in that only one indicator loaded on more than one factor. Although the factorical complexity of several indicators could have been expanded through a more liberal respecification approach, the parsimony of the model would have been reduced. Also, respecifying models to simply capture more variance is poor science in that the purpose of post hoc respecification is to create a more conceptually meaningful model, not to manipulate fit statistics.

An additional explanation for the mediocre fit statistics of Model 3.20 lies in the nature of the community adjustment construct and the nature of the fit statistics used to evaluate structural models. Bollen and Lennox (1991) distinguished models comprised of "causal" indicators that influence latent factors from models comprised of "effect" indicators that are influenced by latent factors. Good effect indicators are highly correlated with one another (i.e., have a high degree of internal consistency). Fit statistics are significantly influenced by the internal consistency of the indicators because they are based on assumptions associated with the classical factor analytic model in that they represent how well the latent variables explain the total variance and the shared variance among indicator variables (Cole, 1987).

Models of community adjustment do not conform to the classical factor analytic model that treats indicators as *effects* of the construct. Rather, indicators of community adjustment are clearly *causes* of the construct. Because causal indicators do not result from the influence of an underlying construct, they do not share the same degree of inter-

nal consistency (i.e., do not correlate as well with one another) as effect indicators (Bollen & Lennox, 1991). Therefore, a model of community adjustment that is comprised of causal indicators will not produce nearly as good fit statistics as a structural model comprised of effect indicators.

Bollen and Lennox (1991) cautioned researchers who are interested in structural models with causal indicators to not be overly concerned with fit statistics as indicators of absolute fit when evaluating the appropriateness of their models. Rather, fit statistics are best used to assess the relative fit of alternative models. It is important that researchers using causal indicators inspect model parameters and assess models logically and conceptually in conjunction with fit statistics when evaluating the overall appropriateness of a factor structure. Preoccupation with measures of internal consistency to evaluate models with causal indicators will result in the dismissal of important measures of a construct.

DISCUSSION

A Revised Model of Community Adjustment

There is conceptual and empirical support for the seven-dimensional model of community adjustment shown in Figure 3. The robustness of the model is supported by significant statistical evidence that has emerged from this investigation and five previous studies as well as by substantial conceptual support for each dimension in professional literature associated with the fields of special education and habilitation (e.g., Cronin & Patton, 1993; Dever, 1988; Hughes & Hwang, 1996; Parmenter, 1992; Schalock, 1996; Smith & Schloss, 1988). This model differs primarily from the eight-factor model presented by McGrew and Bruininks (1994) in the elimination of the Employment Stability dimension. This dimension, reflecting the extent to which individuals are stable in their employment and satisfied with their daytime activities, was abandoned due to the lack of support from data in this study as well as the investigations completed prior to McGrew et al. (1994).

Personal satisfaction. Personal Satisfaction refers to “the extent to which individuals appear satisfied with their daytime activities, living arrangements, social network, and recreation/leisure activities” (McGrew & Bruininks, 1994, p. 73) and has emerged in every study in which satisfaction indicators were included. This dimension is unique in that it is the only factor that reflects subjective feelings and opinions about one’s quality of life. In discussing the quality of life construct, Schalock (1990) distinguished *social indicators* from *psychological indicators*: “Social indicators generally refer to external, environmentally based conditions such as health, social welfare, friendships, standard of living, education, public safety, housing, neighborhood, and leisure. ... Psychological indicators focus on a person’s subjective reactions to life experiences (p. 142). Based on Schalock’s schemata, Personal Satisfaction is the only psychological dimension included in the model.

Although the Personal Satisfaction factor has been supported consistently in the structural modeling research, future investigations should incorporate additional indicators of satisfaction so that a richer, more complex factor can be defined. Indicators re-

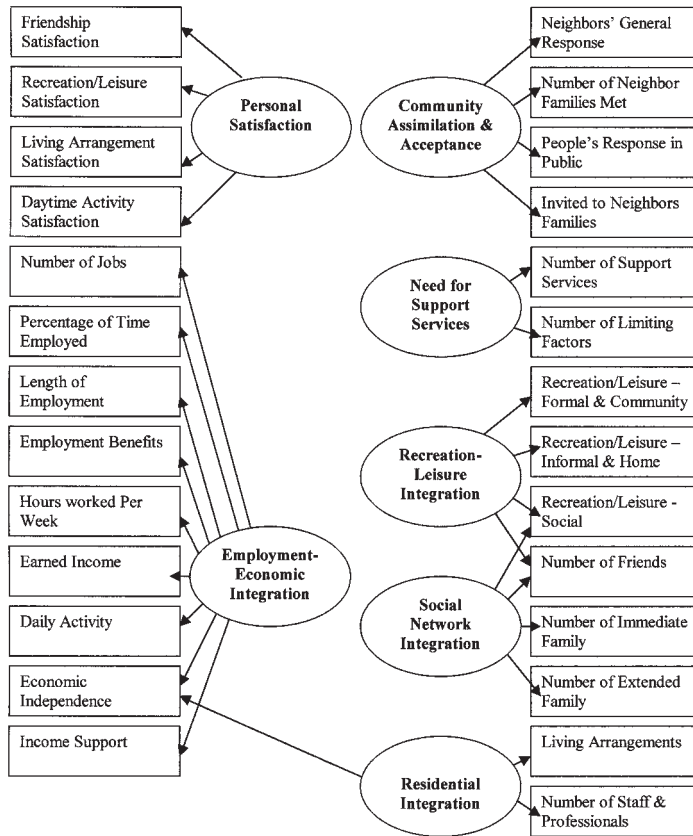


FIGURE 3 The seven-dimensional model of community adjustment supported by prior research.

flecting satisfaction with opportunities for personal growth and improvement, satisfaction with services and supports, and satisfaction with opportunities for choices and decision making would enrich data regarding this dimension. These measures would also be consistent with the recent emphasis on self-determination and personal empowerment within the disability field (e.g., Shapiro, 1994; Wehmeyer & Schwartz, 1997).

Parmenter (1992) reported that personal satisfaction is part of an “affective” subcomponent of an individual’s sense of “self.” He proposed that personal satisfaction is closely linked to feelings of self-esteem, sense of control, acceptance of disability, and happiness. Measures reflecting these concepts would also be important to include in future investigations.

Employment–economic integration. Employment–Economic Integration refers to “the extent to which individuals are economically self-sufficient and involved in stable and integrated daily work or related activities” (McGrew & Bruininks, 1994, p. 73). Because this factor has emerged in all of the previous structural modeling studies, future researchers may want to consider dropping certain indicators that consistently have small

loadings, are difficult to interpret, or contain substantial error variance (e.g., number of jobs, length of employment). Additionally, expanding the complexity of some indicators to create more sophisticated measures would be worthwhile (e.g., expanding the number of job benefits considered within the Benefits indicator). Finally, Kiernan and Knutson (1990) reported that measures of productivity and personal feelings of accomplishment and contribution are essential to understanding the quality of an individual's work life. The development and inclusion of such indicators would enhance the comprehensiveness of this dimension.

Recreation/leisure integration. This factor has emerged in all of the studies in which three or more multivariate recreation and leisure measures were collected. McGrew and Bruininks (1994) defined it as "the extent to which individuals are actively involved in formal and informal recreation-leisure activities both in the home setting and in the community" (p.73). Although this dimension is well defined in the sense that a relatively large and diverse collection of recreational and leisure activities are considered, it is important to note that the 16 dichotomous variables that were used to construct the indicators only measured frequency of participation in a variety of activities. Schleien, Rynders, and Green (1994) indicated that it is essential to consider the extent to which individuals have the option of participating in preferred activities when evaluating the quality of recreational and leisure programs. Variables measuring the extent of congruence between what an individual wants to do with his or her recreation/leisure time and what he or she has opportunities to do would generate a more complete dimension.

Community assimilation and acceptance. McGrew and Bruininks (1994) defined this factor as "a reflection of both involvement with and degree of positive response or acceptance of a person with a disability by neighbors and others in the community" (p. 74). Bruininks et al. (1992) reported that the factor was similar to the Social Support and Safety factor identified by Halpern et al. (1986). More than any other factor included in the model, Community Assimilation and Acceptance concerns the response of the larger society to the individual. Parmenter (1992) and Schalock (1997) discussed the importance of cultural factors on the quality of life of persons with disabilities and suggested that the degree to which persons are truly valued by the larger society is reflected in the extent to which they are accepted and included in cultural institutions (e.g., home, school, church) and culturally valued activities. Because this dimension emerged only in the Bruininks et al. (1992) study, a single exploratory analysis on data from a sample of adults with mental retardation, it is important that future studies involving more diverse populations include indicators related to this factor (i.e., neighbors' general responses, number of neighbor families met, people's responses in public, and invitations to homes of neighbors).

Additional indicators that logically reflect this dimension should also be developed for incorporation into future studies. Such measures may include membership in community organizations such as clubs and churches, use of public facilities and services, and participation in civic functions. Furthermore, inclusion of social safety indicators

(e.g., freedom from abuse, teasing, harassment, robbery) that Halpern et al. (1986) used in their research would be helpful in further understanding the Community Assimilation and Acceptance factor.

Social network integration. Social Network Integration can be defined as “the extent to which individuals have developed a social support network” (McGrew & Bruininks, 1994, p. 73). The extraction of this factor in this study was precluded because two of the four indicators that were expected to load on it had highly nonnormal distributions and had to be discarded.

The types of indicators associated with this dimension in previous studies appear to be limited in scope. Researchers have only used indicators that reflect the number of friends and family members who are identified as special friends to define the Social Network Integration dimension. Although the quantity of friends is certainly a plausible measure of an individual’s social integration, research on social relationships among people with disabilities has shown that variables reflecting quality of relationships, types of relationships, and social experiences are also important (Abery & Fahanestock, 1994). Including indicators that reflect opportunities for regular contact with friends and types of friendships (e.g., romantic, work, neighborhood) would provide a richer description.

Need for support services. This factor refers to “the extent to which a person needs a wide variety of services to function within the community” (McGrew & Bruininks, 1994, p. 73). Although it emerged in the Bruininks, Thurlow, et al. (1990) and McGrew et al. (1992) investigations, it has not been investigated in the more recent structural modeling studies. Its cross-validation was precluded in this study due to an insufficient number of appropriate indicators.

Bruininks, Thurlow, et al. (1990) and McGrew et al. (1992) reported that the two indicators loading on the Need for Support Services factor were Number of Personal Limiting Factors and Number of Support Services Used. The Number of Support Services Used indicator was taken from the Inventory for Client and Agency Planning (Bruininks, Hill, Weatherman, & Woodcock, 1986) and is conceptually similar to the Formal Support Services indicator that was used in this study. However, no measure of Number of Personal Limiting Factors was available for analysis in this investigation. The narrow scope of indicators used to extract this factor in past studies is a serious drawback to establishing the validity of this dimension. Future studies should include indicators that reflect the use of natural supports and the degree of fit between the types of supports that are available and the supports that an individual wants and needs.

Continued investigation of the Need for Support Services dimension is especially critical in light of the changing conceptualization of mental retardation that has occurred in recent years. According to the most recent definition and classification manual of mental retardation published by the American Association on Mental Retardation, “mental retardation is present when specific intellectual limitations affect the person’s ability to cope with the ordinary challenges of everyday living in the community” (Luckasson et al., 1992, p. 13). Based on this conceptualization, the primary role of the

service delivery system is to identify and provide the types and intensities of support that an individual needs to most fully participate in daily life activities. The American Association on Mental Retardation manual also calls for the classifying individuals according to intensity of support needs (i.e., intermittent, limited, intensive, and pervasive) rather than the severity of impairment (i.e., mild, moderate, severe, and profound). A reliable means by which to measure support needs is critical to assuring that assessment activities based on the new definition are truly more “functional, relevant, and oriented to service delivery and outcomes” (Luckasson et al., 1992, p. 34) than traditional assessment methods.

Although “Need for Support Services” is a very important concept, it is questionable whether this dimension fits conceptually within a measurement model of community adjustment. As discussed previously, a dimension of “supports” is best conceptualized as an “enabling” dimension (Ysseldyke et al., 1992) that functions to enhance “social” (e.g., Residential Integration, Employment–Economic Integration, Recreation/Leisure Integration) and “psychological” (e.g., Personal Satisfaction) outcomes. Due to the mediating function of supports and services, support outcomes are not necessarily desirable in and of themselves but are only appealing to the extent that they lead to enhance life options and experiences. In actuality, it is reasonable to assume that services and supports that are not effective (i.e., do not function to enhance social and psychological outcomes) are not wanted by most people. Additionally, the Need for Support Services factor is unique from the other dimensions of the model in that the indicators associated with it are effect indicators as opposed to causal indicators. “Need for Support Services” can best be conceptualized as an underlying cause of the indicators Number of Support Services Used and Number of Limiting Factors. As discussed earlier, the other dimensions comprising this community adjustment model are best conceptualized as being caused by their corresponding indicators.

Residential integration. The Residential Integration factor was defined by McGrew and Bruininks (1994) as “a person’s degree of independent living and integration into the community” (p. 73). The problem with this factor stems from a lack of cross-validation in prior studies and the narrowness of the indicators that have been used to define it. This study and the McGrew et al. (1994) study are the only two investigations that included a sufficient number of indicators that correspond to this dimension. In McGrew et al., only two indicators loaded on the factor. These indicators reflected people’s living arrangements (e.g., by self, with friends, in a group home, in an institution) and the number of staff and professionals whom individuals included in their circle of friends. This study included three indicators—the two from the McGrew et al. investigation plus a third indicator reflecting economic independence (i.e., independence in banking, shopping). Despite this addition, it is apparent that the scope of indicators defining this factor is extremely narrow.

Future investigations should include additional indicators that measure fundamental components of residential integration such as quality of home (e.g., physical attractiveness, space), neighborhood attractiveness and safety, accessibility to community services, personal choice regarding roommates and household decorations, and other integral measures related to an individual’s daily home life (Racino & O’Connor, 1994).

Moreover, variables used by Halpern et al. (1986) in defining their Residential Environment dimension, reflecting access to services, residential comfort and upkeep, and neighborhood quality, would be useful to include.

Implications for Program Evaluation and Research Integration

A future direction for this line of research is the development of measurement instruments that can be used to more broadly and deeply assess the community adjustment of people with disabilities. Such instruments would greatly assist individuals who are involved in the development and evaluation of services and public policies. Traditionally the evaluation of special education and other programs targeted to people with disabilities has focused on the extent to which organizations comply with rules and regulations that govern the way that services are to be delivered. Lakin, Larson, and Prouty (1994) referred to the monitoring and compliance measures that underlie these evaluations as structural and process variables. Examples of these variables include evidence of a planning document in each consumer's file, verification that qualified staff delivered specific services, and documentation that physical facilities meet health and safety criteria. An emerging trend in program evaluation is to base quality assessment on the outcomes that the individuals receiving services experience as opposed to structural and process measures of the organization.

Despite agreement regarding the importance of basing program evaluation on the outcomes experienced by the people who receive services, there is little consensus on which outcomes need to be measured. Although the model of community adjustment presented in this article is still in the formative stages of development, it can provide a starting place for identifying outcome measures for evaluation purposes. A useful way to select variables for inclusion into a minimum set of outcome indicators would be to identify indicators that have a strong empirical relation to larger community adjustment dimensions. Because these measures are collected on individuals, they could be used to monitor the well-being and growth of individuals with disabilities and aggregated to reflect the progress of programs. A longitudinal collection of key indicators would enable programs to identify relatively good and poor aspects of service provision. Additionally, such measures would provide programs with a means to assess the effectiveness of policy and programmatic initiatives.

The creation of a minimal data set comprised of key indicators of community adjustment would also enhance efforts to integrate and synthesize research. If researchers investigating the community adjustment of persons with disabilities collected data on a set of common indicators, research findings could be directly compared across studies and samples.

Limitations

Three study limitations related to the way in which data were collected must be considered. First, the practice of mixing respondents (i.e., self, parent) may have introduced an

unknown methodological artifact into the data. Research indicates that different informants do not always provide the same information (Bullis, Bull, Johnson, & Peters, 1994; Levine & Edgar, 1994). A second limitation was the lack of information on those who were not contacted. Although the 55% response rate was relatively good considering the population that was targeted, it is probable that the life experiences and status of those not reached for interviews differed from those who were interviewed. A third sampling limitation concerns the lack of documented diagnostic information on the participants in the study. Because the accuracy of disability diagnoses made by school districts included in the investigation could not be verified, the extent to which results can be generalized to similar populations is limited.

Conclusions

Successful community adjustment is considered to be a critical aspect of an individual's quality of life, a broad construct that encompasses a very rich and complex set of variables. The multivariate complexity of the quality of life construct requires methods and models that can capture the numerous subtleties of this construct. This investigation expanded and extended a line of research designed to identify empirically valid domains in an emerging multidimensional model of community adjustment. Valid measures of community adjustment dimensions are essential to understanding the complex and rich process of community adjustment. As this process becomes better understood through the validation of theories and measures of this admittedly complex process, researchers, policymakers, and service personnel will have an increasingly better basis by which to establish service priorities and monitor the outcomes of services and supports that are provided to persons with disabilities.

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