

Community Integration of Young Adults With Mental Retardation: A Multivariate Analysis of Adjustment

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The purpose of the present study was to determine whether differences in community adjustment existed for three groups of young adults with mental retardation using data organized on the basis of four empirically validated factors identified in prior research. A descriptive discriminant function analysis was used as a follow-up to a statistically significant multivariate analysis of variance F-ratio. Results obtained from the discriminant analysis indicated that five variables (number of limiting factors, earned income, number of support services, living arrangement, number of daytime activities) contributed substantially to separation of the three group centroids.

The adjustment of young adults transitioning from school to community living continues to be a concern of parents, professionals, and policy mak-

ers interested in the provision of services to persons with mental retardation. Where service providers were once concerned primarily with the physical integration of clients into normative settings, this concern has now given way to an emphasis on and appreciation for quality-of-life issues, a quality that implies the integration and adjustment of the whole person into community living (Ittenbach, Larson, Spiegel, Abery, & Prouy, in press b).

Although much has changed about the ways in which services are provided to young adults with mental retardation, the research base has remained remarkably constant. For example, despite the rather extensive and longstanding nature of studies pertaining to the adjustment of adults with mental retardation (Craig & McCarter, 1984; Goldstein, 1964), most recent studies have concentrated on the relationships among educational characteristics and vocational opportunities for persons with mild mental retardation (e.g., Edgar, 1987; Fardig, Algozzine, Schwartz, Hensel, & Westling, 1985; Schalock et al., 1986; Wehman, Kregel, & Seyfarth, 1985; Zigmund & Thornton, 1985). Far fewer have focused on the transitional needs of persons with moderate to severe disabilities (e.g., Edgar & Levine, 1986; Hasazi, Gordon, & Roe, 1985; Thurlow, Bruininks, & Lange, 1989; Wehman et al., 1985), and still fewer have approached the issue from anything more than a simple univariate perspective (Heal, 1985; Larson & Ittenbach, 1991). The research has indeed provided valuable descriptive information on the characteristics, integration, and adjustment of young adults with mental retardation, yet, has somehow failed to capture the complexity of the rich and vital patterns of community adjustment (McGrew & Bruininks, 1991). Given that "the research questions in community integration are almost certainly multivariate in complexity" (Heal, 1985, p. 215), and that "multivariate methods . . . mirror the actual complexity of behavioral 'reality'" (Kerlinger, 1986, p. 524), it is somewhat surprising that multivariate techniques have not been used with greater frequency in community adjustment research in recent years.

Apart from two principal studies (i.e., Halpern, Nave, Close, & Nelson, 1986; McGrew, Bruininks, Thurlow, & Lewis, 1992), little empirically defensible data have been generated with which to examine multidimensional patterns of community adjustment. In the McGrew et al. (1992) model, and the one on which this study is based, four principal areas of community adjustment have been identified: Social Network Integration, Recreational/Leisure Integration, Community and Economic Integration, and Need for Support Services. The four dimensions consist of 12 composite variables and represent in excess of 50 separate indicator variables. A brief review of the literature pertaining to these factors, generated through exploratory and confirmatory factor analytic methods in samples of persons with mild to severe levels of disability ($N > 500$; McGrew et al., 1992) follows.

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SOCIAL NETWORK INTEGRATION

The ability to enter into and sustain interpersonal relationships, hereafter referred to as social network integration, remains a crucial component of one's level of community adjustment (Landesman-Dwyer & Berkson, 1984). The ability to relate to others, development of social controls, and internalization of societal values are some of the many contributions of social relationships to the adjustment process (Hartup, 1991). Despite the importance of socialization to community adjustment, however, there is evidence to suggest that socialization patterns of young adults with mental retardation are inordinately different from those of peers without mental retardation. For example, young adults with mental retardation tend to have few longstanding friends without mental retardation, have socialization patterns that consist primarily of family members or paid caregivers, and are much more likely to be affected by the limiting influences of barriers within the family and community (Abery, Thurlow, Bruininks, & Johnson, 1989; Abery, Thurlow, Johnson, & Bruininks, 1990; Kennedy, Horner, & Newton, 1989; Zelin & Murrain, 1988). Attitudes of community members, access to age-appropriate community-based programs, and a general hesitancy to treat young adults with mental retardation as young adults first and foremost place them at a distinct disadvantage in the acquisition of essential socialization skills (Ittenbach, Abery, Larson, Spiegel, & Prouty, in press a).

RECREATIONAL/LEISURE INTEGRATION

The ability to initiate and sustain meaningful leisure-time activities, generally referred to as recreational/leisure integration, is also an essential component of community adjustment (Rynders & Schleien, 1991; Verhoven, Schleien, & Bender, 1982). Similar to the aforementioned difficulty acquiring and maintaining social relationships, young adults with mental retardation are reported to engage in recreational and leisure programs much less frequently than young adults without mental retardation (Dattilo, 1987). Further, these activities tend to be passive rather than active and tend to be other- rather than self-selected (Aveno, 1987; Kregel, Wehman, Seyfarth, & Marshall, 1986). Although integrated recreational and leisure programs are becoming much more prevalent, nearly one-third of all adults with mental retardation in the United States report an unmet need for recreational and leisure services (Temple University Developmental Disabilities Center, 1990). Whether one is interested in a hobby, specialized skill development, recreational pastimes, or international competition (e.g., Special Olympics, Unified Sports Activities), the benefits of involvement in such programs are many (e.g., enhanced skill development, increased social interactions,

greater acceptance by peers with and without disabilities, greater enjoyment in life-affirming activities) (Ittenbach et al., in press a).

COMMUNITY AND ECONOMIC INTEGRATION

The degree to which a person is able to systematically obtain and disburse income generally typifies the concept of economic integration. However, the Community and Economic Integration dimension defined by McGrew, Bruininks, and Thurlow (in press) implies a somewhat broader definition, one that includes, to a very large degree, employment. Unlike the rather obvious link between social integration and employment, unlike integration, the relationships between economic integration and the aforementioned areas are much more subtle. That is, opportunities for inclusion in community-based social and recreational programs, particularly highly organized ones, require money, a commodity that most young adults with mental retardation find in short supply. And, as Salzberg, Lignagaris-Kraft, and McCuller (1988) have documented, the ability to hold a job requires some degree of proficiency in socialization. Although economic integration does not require paid employment, an occupation and the self-sufficiency that it provides offer many direct (increased independence and autonomy) and indirect (feelings of competence and self-worth) rewards (Ittenbach et al., in press b). Ironically, however, job retention, limited employment options, and financial disincentives to employment for young adults with mental retardation often inhibit efforts toward normalization (Brickey, Browning, & Campbell, 1982; Rusch, 1986; Schaffer, Banks, & Kregel, 1991; Schloss, Schloss, & Wolf, 1988).

NEED FOR SUPPORT SERVICES

Young adults with mental retardation, similar to young adults without mental retardation, vary in the extent to which they adapt to independent and semi-independent living arrangements. However, unlike their peers without mental retardation, these young adults generally require the presence of support services for full community adjustment (Temple University Developmental Disabilities Center, 1990). Among the many studies that have identified and quantified specific types of support services required by persons with mental retardation (e.g., Hill et al., 1989; Temple University Developmental Disabilities Center, 1990; Thurlow, Bruininks, & Lange, 1989), lack of access to activities, lack of a friend or advocate with whom to share experiences, and lack of financial resources were reported to be common impediments to full community inclusion (Ittenbach et al., in press a). In addition, and not surprisingly, young adults

with more severe degrees of mental retardation were found to require more numerous, specific, and expensive supports than young adults with mild mental retardation (Thurlow, Bruininks, Wolman, & Steffens, 1989). Shaping these supports further are the many different characteristics of individuals, families, and communities responsible for providing and accessing such services.

Given the pressing concerns of parents, professionals, and policy makers, the growing data base on key components of the community adjustment process, and the need to understand more fully the complex nature of community adjustment, a multivariate analysis of the adjustment of young adults with mental retardation seems long overdue. The purpose of the present study, then, was to determine whether differences in community adjustment existed for three groups of young adults with mental retardation. Data analyzed were organized on the basis of four empirically validated factors identified in prior research.

METHOD

Participants

The records of 105 young adults with mild to severe levels of mental retardation were taken from a broader sample ($N = 239$) of subjects on whom community integration data were gathered (Bruininks, Thurlow, McGrew, & Lewis, 1990). In this study, three samples of 35 persons per group were selected from those with mild, moderate, and severe/profound mental retardation. Group assignment was based on formal classification information from previous records, standardized IQ scores (mild, IQs 60-79; moderate, IQs 40-59; severe/profound, IQs ≤ 39), and adaptive behavior scores. Because a disproportionately small number of persons in the broader sample were classified as mild, all subjects in the mild group with complete data were included in the study. The records of subjects with moderate and severe/profound levels of mental retardation were selected randomly from among their respective samples. The samples were limited to 35 persons per group for two reasons: the need for a balanced design due to heterogeneity of variance, and the need for complete sets of data.

Respondents ranged from 19 to 33 years of age ($M = 25$ years, $SD = 3$ years) and were interviewed 1-10 years after exiting high school. The total sample was divided evenly according to gender (50% female, 50% male); 3% were African American, 2% Asian American, 94% European American, and 1% Native American. The majority of respondents (94%) were never married; 4% were married, 1% were separated, and 1% were divorced. In terms of service level, 2% required total care, 9% required extensive care, 25% required regular care, 30% required limited care, and 34% required

infrequent or no assistance for daily living. See Bruininks, Thurlow, McGrew, and Lewis (1990) for a description of the broader sample.

Instruments

Two instruments were used to provide information for this investigation. The first was a detailed 142-item questionnaire designed to represent 11 areas of community adjustment (viz., employment, education, social participation, support payments, social adjustment and living skills, health/physical status, family household characteristics, living arrangement, service and program participation, citizenship status, miscellaneous information). Items on the questionnaire were based upon previous and extensive field research on community adjustment (Thurlow, Bruininks, & Lange, 1989). The second instrument, the Inventory for Client and Agency Planning (ICAP; Bruininks, Hill, Weatherman, & Woodcock, 1986a), is a "comprehensive, structured instrument designed to assess the status, adaptive functioning, and service needs of clients" in large- and small-scale facilities (Examiner's Manual; Bruininks, Hill, Weatherman, & Woodcock, 1986b, p. 1). The ICAP is reported to be appropriate for the service and programming needs of clients regardless of ability level. According to the Manual, the ICAP was normed on a nationally representative sample of approximately 1,700 persons 3-42 years of age. Median split-half reliability estimates for the battery composite are high (median = .89) with test-retest values in the .80s and .90s. Validity data for the ICAP indicate that it discriminates effectively among levels of mental retardation, special education service, restrictiveness in residential placement and employment, and between children with and without behavior problems (Bruininks et al., 1986b). Table 1 presents a summary description of the 11 dependent variables obtained from the two instruments and organized according to the four areas of community adjustment validated in the McGrew et al. (1992) study.

Procedures

Both instruments were administered directly to the subject or to an informed respondent. In each case, the ICAP was administered first (20-30 min) followed by the 142-item questionnaire (40-50 min). All interviewers were carefully trained and supervised to provide reliable results (see Thurlow, Bruininks, & Lange, 1989; Thurlow, Bruininks, Wolman, & Steffens, 1989).

Data Analysis

A single one-way multivariate analysis of variance design (MANOVA) was used to determine whether differences in community adjustment exist-

TABLE 1
Description of Community Adjustment Variables

Domain/Measure	Description
Social network integration Number of friends Variety of friends	Number of friends Special friend, peer friend, residence staff friend, teacher/boss friend, romantic friend, other friend, regular contact with same age nonhandicapped friend
Recreation/Leisure integration Recreation/Leisure — social	Dined out, visited a friend, attended: party, dance, sporting event, movie, concert, play Involvement in club or organization, visited others in community, attended sporting event, religious service
Recreation/Leisure — formal	Games (cardboard, toys), musical activities, hobbies, went to a park or for a walk, paper activities, visited with relatives
Recreation/Leisure — informal	
Community and economic integration Income support	Amount of social security and disability income per month
Earned income Daytime activity ^a	Amount of income earned per month 1 = no formal program outside home, 2 = day care, 3 = day/work activity center, 4 = sheltered workshop, 5 = school or volunteer, 6 = supervised/support employment, 7 = competitive employment
Living arrangement ^a	1 = institution, hospital, or nursing home, 2 = group residence, 3 = family or relatives, 4 = apartment training, 5 = independently or with friends
Need for support services Number of limiting factors	Number of factors limiting social and leisure activities as reported on the ICAP Social and Leisure Activities Scale
Number of support services	Number of community support services as reported on the ICAP Support Services Scale

^aDenotes a continuum or rating scale format; all other variables are assumed to be based on an additive scale. See McGrew et al. (1992) for a more detailed description of the variables presented here.

ed for the three groups of young adults with mental retardation across all 11 of the aforementioned variables. Levels of mental retardation (mild, moderate, severe/profound) served as the controlling variable. All data were analyzed using SPSS/PC+ statistical software (SPSS/PC+, Inc., 1986). Pillai's trace (Pillai, 1955) was used as the multivariate test of choice because of the likelihood of two discriminant functions and the test's tendency to retain statistical power when violations of homogeneity of matrices and distributional normality are present (Bernstein, 1988; Stevens, 1986). Descriptive discriminant function analysis was used as the follow-up technique because of the intercorrelated nature of the dependent variables, robustness to multivariate normality, and ease and efficiency of interpretation (Huberty, 1992).

Violations of homogeneity of matrices and univariate normality were observed but were not considered threatening enough to abandon the hypothesized model. For example, a Bartlett's Box-M observed $\chi^2(66)$ of 129.42, $p = .00$, exceeded the critical $\chi^2(01; 66)$ of 88.38, a violation that may have been as due to the sensitivity of the test as to meaningfully and statistically significant differences among groups. The decision to proceed with the multivariate analysis was made with caution, given the beliefs that these data represent fairly the general population of persons with mental retardation and the linear composite is usually normally distributed even when the dependent variables, taken independently, are not (Barker & Barker, 1984; Harris, 1985).

RESULTS

Prior to conducting the MANOVA, mean and standard deviation values were computed for each of the 11 dependent variable measures by level of mental retardation (see Table 2).

The hypothesis that no statistically significant differences in community adjustment existed for the three groups of young adults with mental retardation was rejected based on a Pillai $F(05; 2, 102)$ of 5.91, $p < .01$. A posthoc analysis of power computed using criteria outlined by Stephens (1980) exceeded .96 ($\beta \leq .04$) and suggested that the test was indeed capable of detecting statistically significant differences at the .05 level, a level of power that is in part traceable to $\eta^2(1 - \Lambda)$ in which 74% of the total variance was accounted for by levels of mental retardation. Centroids for each of the three groups of young adults with mental retardation were distributed along the function's axis in a statistically and sufficiently disparate manner: mild (-2.03), moderate (.49), severe/profound (1.54).

Follow-up analyses using descriptive discriminant analysis revealed that, although as many as two orthogonal functions were possible, only one was deemed powerful enough to discriminate among the three groups of young adults with mental retardation. The first residual (2nd function) was not statistically significant, $\chi^2(10) = 12.93$, $p = .23$. The 11 variables associated with the first function yielded a Wilk's lambda of .26 and a canonical correlation of .70 with levels of mental retardation. The relative importance of the first discriminant function is underscored by the finding that the eigenvalue for the first function (2.31) was nearly 17 times larger than the eigenvalue for the residual (.14).

Two different types of coefficients were used to examine the fully specified equation, standardized discriminant weights, and structure (variable-function) coefficients. Where the standardized weights reveal the strength of individual variables relative to the entire model, structure coefficients describe the strength of the relationship between group performance on a

single variable and group performance on the discriminant function. Both are considered to be indispensable components of multivariate discriminant analysis (Huberty, 1992; Thompson 1990; Thompson & Borrello, 1985).

Inspection of the standardized weights revealed a well-balanced function comprised of many influential contributors. Although only 1 variable had a standardized value in excess of .50 (number of limiting factors), 5 of the remaining 10 variables exceeded $\pm .30$. All others fell short of the .30 mark with only two variables, recreation/leisure — informal (-.04) and number of friends (-.14), as particularly weak contributors (see Table 2).

Only 1 structure coefficient was found to be low in magnitude (income support, .27); the remaining 10 fell into one of two categories, moderate or very low in magnitude. All five variables with structure coefficients in the moderate range were considered strong enough to be worthy of consideration in the present model: number of support services (.53) number of limiting factors (.52), earned income (-.48), daytime activities (-.42), and living arrangement (-.41) (see Table 2). When taken together, indices from both the standardized weights and the structure coefficients provided evidence to suggest that these five variables were primarily responsible for the strong discriminating ability of the first discriminant function.

DISCUSSION

Results of this study suggest three findings. First, differences among groups of persons with varying degrees of mental retardation exist relative to community adjustment. Second, only one underlying dimension of community adjustment was found necessary to discriminate among groups of persons with varying degrees of mental retardation. Third, although this dimension represents a composite of many different measures, 5 of the 11 variables can be considered major contributors to the discriminating ability of the function. An implicit purpose of this investigation was to include a wide array of variables not typically used in adjustment studies, variables that these and other researchers (e.g., Bruininks, Thurlow, Lewis, & Larson, 1988; Larson & Lakin, 1989; McDonnell & Hardman, 1985) have found to be important correlates of adjustment for young adults with mental retardation. The search for measures that discriminate effectively among young adults with mental retardation who are and are not making the adjustment to community living appears to have been achieved.

Of the two discriminant functions that were identified (based on a dependent variable with three levels), only one was believed to be interpretable. That is, of the 11 variables working together to provide a conjoint measure of community adjustment that effectively discriminated among the three groups of young adults with mental retardation, only 5 variables appeared to be particularly strong contributors to the model: number of support ser-

TABLE 2
Descriptive Statistics and Discriminant Function Values

Dimension Variable	Mild			Moderate			Severe/Profound			Standardized Weights	Structure Coefficients
	M	SD		M	SD		M	SD			
	Levels of Classification										
Social network integration	3.60	4.36	2.62	2.89	1.86	3.14	1.97	1.82	3.14	-.14	-.13
Number of friends	2.80	1.26	2.63	1.61	1.86	3.14	1.97	1.82	3.14	-.14	-.13
Variety of friends	2.80	1.26	2.63	1.61	1.86	3.14	1.97	1.82	3.14	-.14	-.13
Recreation and leisure integration	2.03	1.07	2.00	1.26	1.97	1.27	1.27	1.04	1.27	.31	-.01
Recreation/Leisure — social	2.03	1.07	2.00	1.26	1.97	1.27	1.27	1.04	1.27	.31	-.01
Recreation/Leisure — formal	.80	.63	.91	.82	1.40	1.04	1.42	1.04	1.27	.24	.17
Recreation/Leisure — informal	5.40	1.17	6.09	1.48	6.03	1.42	1.42	1.04	1.27	-.04	.14
Community and economic integration	38.02	96.99	150.31	129.85	154.36	149.93	149.93	154.36	149.93	.22	.27
Income support	38.02	96.99	150.31	129.85	154.36	149.93	149.93	154.36	149.93	.22	.27
Earned income	539.18	458.20	179.76	193.27	39.05	62.01	39.05	62.01	39.05	-.31a	-.48a
Daytime activities	6.11	2.04	4.34	2.21	3.31	.87	3.31	.87	3.31	-.21a	-.42a
Living arrangement	3.46	1.97	2.80	.58	2.31	.47	2.31	.47	2.31	-.35a	-.41a
Need for support services	.06	.24	1.11	.76	1.11	.72	1.11	.72	1.11	.54a	.52a
Number of limiting factors	.06	.24	1.11	.76	1.11	.72	1.11	.72	1.11	.54a	.52a
Number of support services	.06	.24	1.11	.76	1.11	.72	1.11	.72	1.11	.54a	.52a
*Substantive contributors to the first discriminant function.											

ices, number of limiting factors, earned income, daytime activities, and living arrangement. Two variables, variety of friends and recreation/leisure — informal, had sufficiently strong standardized weights but lacked convincing structure coefficients, thus calling into question the unique relationships between each variable and the function itself, respectively.

Interestingly, all five identified variables came from one of two previously validated dimensions of community adjustment, Community and Economic Integration and Support Services. By far, the strongest contributors came from the Support Services dimension (number of limiting factors and number of support services; see Table 2). As indicated previously, all young adults, including those without mental retardation, vary in their ability to adjust to community living. Those with mental retardation, however, generally require more services and supports (Temple University Developmental Disabilities Center, 1990). Therefore, it should come as no surprise to service providers that the more limiting factors with which a person must contend, the greater the difficulty in adjustment. Equally obvious is the relationship between number of limiting factors and number of support services. Although the Temple University study has pointed out many of the discrepancies between services needed and services provided, the number of services accessed rarely increases without an a priori increase in limiting factors. The relationship between measures of the Support Services dimension and each of the other dimensions becomes particularly obvious when one considers that neither limiting factors nor support services (needed or accessed) exists in a vacuum, and that whether a young adult or family is requesting transportation, in-home respite care, vocational training, counseling, or out-of-home leisure activities, barriers are encountered and supports are needed (Ittenbach et al., in press a).

Three of the five principal contributors came from the Community and Economic Integration dimension (earned income, daytime activities, living arrangement; see Table 2). Though this dimension implies more than simply obtaining and disbursing income, it does reflect strongly on one's ability to make substantive choices about one's financial obligations (Ittenbach et al., in press b). Not surprisingly, the greater the disability the greater the expenses (Thurlow, Bruininks, Wolman, & Steffens, 1989). Federal and state income-support programs combined with long-term entitlements that, in the past, have been tied as much to one's level of disability as to one's living accommodations, also reflect the overt relationship between financial obligations and degree of community inclusion. The aforementioned link between economic integration and each of the other dimensions is underscored by one very important requirement — adequate financial resources. The current emphasis on the adjustment of the whole person to community living requires financial supports to be available for more than basic care needs. Dining with friends, attending movies or sporting events,

pursuing hobbies at home or in the community, even regular attendance at religious events generally require financial commitments. Without money, many of these avenues of integration become inaccessible or at least extremely difficult.

The fact that Social Network Integration measures did not emerge as important indicators has some basis in the literature (Hill & Bruininks, 1981). For example, Bruininks et al. (1988), using a related data base on former students with mild disabilities, found that number of close friends did not vary across type of disability. The tendency for persons with more severe degrees of mental retardation who are often in supervised residential settings to have friends with care-provider responsibilities may account for the failure to find differences. Similarly, no Recreational/Leisure Integration measures were found to contribute to group differences in a readily identifiable manner. That is, all groups appeared to participate at the same approximate levels in social events inside and outside of the home (e.g., visiting with others or playing games). If anything, persons with more severe degrees of mental retardation seemed to access more formally scheduled group activities (e.g., attending more events or religious services than persons with mild or moderate retardation). A finding such as this is not surprising when one considers that many group homes and facilities have programmatic requirements for both staff and group home members, requirements that young adults with mild degrees of mental retardation may not have. The lack of advantage in recreational opportunities and friendships for those persons with mild mental retardation tends to confirm the observation of limited friendships and access to community resources (Abery et al., 1989; Halpern, Close, & Nelson, 1986).

There are several limitations that restrict the generalizability of these results and point to the need for further research. First, similar to other studies, samples used in this study were not randomly selected; therefore, generalizations to other samples of young adults with mental retardation must be made with caution. Second, the assumptions of homogeneity of matrices and normality were not met. Although the model was not abandoned, the extent to which departures from normality and homogeneity of matrices have affected the results cannot be known with certainty. Third, two variables (daytime activities and living arrangement) were ordinal in nature, thereby violating a major premise of parametric analyses — the requirement for interval level data. Fourth, data were not available on a control group of young adults without mental retardation to serve as a baseline. And, fifth, although 74% of the variance may have been accounted for by levels of mental retardation, 26% of the variance was unaccounted for, suggesting that factors other than levels of mental retardation may have accounted for many of the differences observed in these results.

It is recommended that investigators continue to search for techniques and models that better explain community adjustment outcomes for individuals with varying degrees of mental retardation. Additional variables could include indices of satisfaction, better indices of social networks, and more sensitive measures of recreational and leisure functioning. It is further recommended that research on the adjustment of young adults with mental retardation employ a broader range of outcome measures than has been used in the past, and that multivariate procedures be employed with greater frequency to derive dimensions of adjustment that adequately address quality-of-life issues and the multifaceted nature of community living.

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