

# Relationship Between Measures of Adaptive Functioning and Community Adjustment for Adults with Mental Retardation

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*ABSTRACT: This study investigated the concurrent relations between measures of adaptive/maladaptive behavior and community adjustment in a sample of 239 adults with mild to severe degrees of mental retardation. Using canonical correlation procedures and multidimensional community adjustment measures, the investigators found significant relations between the measures of behavior and several community adjustment dimensions. The results provided evidence for the criterion-related validity of measures of adaptive/maladaptive behavior and suggested that such skills provide an important contribution to community adaptation and to program planning and decision making for individuals with mental retardation.*

□ The construct of adaptive functioning is relatively old; its contemporary roots can be found in the early social competency research and definitions of mental retardation (Doll, 1934, 1953; Kanner, 1964; Scheerenberger, 1983). During the past two decades, however, adaptive functioning has been the object of considerable activity. This activity has focused on a variety of theoretical and practical issues, such as the definition of adaptive behavior (Clausen, 1972; Grossman, 1983; Leland, Shellhaas, Nihira, & Foster, 1967; Mercer, 1973, 1979; Reschly, 1982, 1985, 1987; Zigler, Balla, & Hodapp, 1984), the integration of the adaptive behavior construct within broader models of personal competence (Greenspan, 1979, 1981a, 1981b; McGrew & Bruininks, 1990), empirical investigations of the nature of the adaptive behavior construct (Keith, Fehrman, Harrison, & Pottebaum, 1987; Keith, Harrison, & Ehly, 1987; McGrew & Bruininks, 1989, 1990; McGrew, Ittenbach, Bruininks, & Hill, 1991), and the assessment of adaptive behavior (Harrison, 1987; Heath, 1986; Holman &

Bruininks, 1985; Meyers, Nihira, & Zetlin, 1979).

The American Association of Mental Retardation's *Manual on Terminology and Classification* (Grossman, 1973, 1977, 1983) provides a definition of adaptive behavior, but there remains some disagreement on how to operationally define and measure adaptive functioning. Despite some remaining definitional and measurement issues, professionals increasingly are required to formally assess adaptive behavior, especially as it relates to criteria for classifying someone as an individual with mental retardation and determining eligibility for services.

An important issue in the application of the adaptive behavior construct is criterion-related validity. Extensive research has investigated the relation between measures of adaptive behavior and measures of intelligence, academic achievement, physical developmental abilities, and social skills (Harrison, 1987; Kamphaus, 1987; McGrew & Bruininks, 1990). A major problem, however, remains—lack of evidence for sound

predictive validity related to major aspects of adaptation in community environments (Kamphaus). Though adaptive behavior has been found to correlate significantly with measures of academic achievement, the magnitude of the correlations suggests that knowledge of performance on adaptive behavior scales adds little to predictive ability beyond what is already provided by measures of intelligence.

Perhaps a more important criterion for research and for educational and human service providers would be the prediction of nonacademic functioning, such as performance in a variety of community settings. In recent reviews, Kamphaus (1987) and Harrison (1987) found that adaptive behavior correlated at moderate levels with a variety of nonacademic criteria (e.g., workshop placement, hourly salary, group home resident performance, and postschool adjustment ratings). However, this research has been limited to a handful of studies with a few adaptive behavior scales, limited samples, and a limited range of outcomes.

More recent research in community adjustment has focused on multidimensional outcome measures developed within conceptual models of community adjustment (Bruininks, Thurlow, McGrew, & Lewis, 1990; Halpern, Nave, Close, & Nelson, 1986; Heal, 1985; McGrew, Bruininks, Thurlow, & Lewis, in press). In a sample of 257 adults with mild to moderate retardation, Halpern et al. (1986) used confirmatory factor analysis methods to validate a four-factor community adjustment model that included the dimensions of occupation, residential environment, social support/safety, and client satisfaction. In a sample of 239 young adults with mild to severe retardation, McGrew, Bruininks, Thurlow and Lewis (in press) used confirmatory factor analysis methods to test and cross-validate a four-dimensional model of community adjustment using 12 separate measures. These investigators reported evidence in support of a model that included the dimensions of social network/integration, recreation/leisure integration, community/economic integration, and need for support services.

The prevalent approach in assessing community adaptation is to assess single outcomes, such as employment status, without regard to the clustering of multiple measures into broader constructs (see Goldstein, 1964; McCarver & Craig, 1974). Through the use of multivariate statistical procedures, it is increasingly feasible to identify

broader measures of adaptation. Research on the adaptive behavior of people with mental retardation has similarly been limited to single measures, often without assessment of maladaptive behaviors, thereby unduly restricting the overall measurement of adaptive skills (Bruininks, Thurlow, & Gilman, 1987). Studies have relied primarily on assessing relations among different dimensions of personal competence (e.g., intelligence, academic achievement, and adaptive behavior). These studies have used limited measures, without regard to actual measures of adaptation in home, work, and community environments. Finally, few studies have employed multivariate statistical methods to enable the full exploration of relations among measures of adaptive behavior skills and other constructs.

There is a pressing need for research to explore the relation between aspects of adaptive behavior and a broad array of community-based criterion measures. The purpose of this study was to explore the relation between measures of adaptive and maladaptive behavior and several previously validated, multidimensional community adjustment measures.

## METHOD

### Sample

The sample included young people who had exited secondary public school programs in a large midwestern metropolitan area and who were classified as having mild ( $n = 44$ ), moderate ( $n = 91$ ), or severe ( $n = 104$ ) degrees of mental retardation. During their high school grades, the students with mild disabilities were mainstreamed and were served in resource rooms for part of their school day. The students with moderate or severe disabilities were served primarily in separate special education programs either outside their school district or in an alternative school. The 239 subjects (126 male, 113 female) represented a 68% response rate from all possible subjects who had been out of school from 1 to 10 years and who were contacted for the study. Subjects were contacted first by telephone, followed by a letter that confirmed their agreement to participate in the study and repeated information on the scheduled time of the interview.

At the time of the follow-up contacts, the subjects were found to live and work in a variety of settings. The most frequent daytime activities for the subjects were involvement in a day/work ac-

tivity center (48.7%), competitive employment (27.3%), or a sheltered workshop (14.7%). The remaining subjects were either involved in no formal program outside of their home (5.9%), or were involved in supervised/supported employment (2.5%) or day care settings (0.8%). The largest number of subjects were either living with family members or relatives (46.9%) or in a group residence (41.8%). The remaining subjects were either living independently or with friends (6.7%); were in apartment training or a half-way house (3.4%); or were in an institution, hospital, or nursing home (1.3%). The mean chronological age of the sample was 302.1 months ( $SD = 33.4$  months), and the mean adaptive behavior age (as measured by the *Inventory for Client and Agency Planning*) was 122.4 months ( $SD = 88.7$  months).

### Instrumentation

Information from the *Inventory for Client and Agency Planning* (ICAP) (Bruininks, Hill, Weatherman, & Woodcock, 1986) was gathered directly from the respondent, who was either the former student or an informed third party. The ICAP is a tool for managing information related to planning and evaluating services for people with disabilities, including information on diagnostic and health status, adaptive behavior, problem or maladaptive behaviors, projected service needs, current service placement, support services, and social-leisure activities. The adaptive behavior section contains 77 adaptive behavior items that are also used in a more extensive test, the *Scales of Independent Behavior* (SIB) (Bruininks, Woodcock, Weatherman, & Hill, 1984). The ICAP also includes standardized Problem Behavior scales. The ICAP was standardized on 1,764 subjects selected to be representative of the U. S. population (1980 census). Test-retest, internal consistency, and interrater reliabilities are generally in the .80s to .90s. Extensive validity studies (Bruininks, Woodcock, Hill, & Weatherman, 1985; Bruininks et al., 1986) have indicated that the scales discriminate well between samples of individuals with and without disabilities, correlate in the .70s with other adaptive behavior scales, and correlate highly with age.

The four ICAP adaptive behavior clusters were used in this analysis. The *Social/Communication* skills cluster measures social interaction and the ability to use and understand language.

The *Personal Living* skills cluster measures an individual's effectiveness in meeting the everyday demands of personal independence and autonomy (e.g., self-care, eating, dressing). The *Community Living* skills cluster assesses successful adjustment in the community (e.g., time, money, work skills, use of community). Finally, the *Motor* skills cluster assesses gross and fine motor skills.

The ICAP Problem Behavior Scales use eight problem behavior scales to represent three maladaptive clusters. The *Internalized* cluster measures maladaptive behavior directed toward oneself, and the *Externalized* cluster measures maladaptive behavior directed toward others or the environment. The *Asocial* cluster measures maladaptive behavior in social contexts. The adaptive behavior cluster scores were in the form of *W* scores, a special transformation of the Rasch ability scales (Bruininks et al., 1985, 1986; Woodcock, 1978). The *W* scale is an equal-interval scale centered on a value of 500, which is the approximate average performance of a beginning fifth-grade student. The maladaptive clusters are based on a scale with a zero mean and a standard deviation of 10, which represents the variability typically observed in a variety of clinical samples (Bruininks et al., 1985).

A 142-question interview protocol was administered concurrently to the same respondents. This protocol was designed to gather information concerning the subject's current work, day program or other activities, past employment, job-search skills, education, day program participation, living arrangements, social networks, citizen responsibilities, use of support programs, and social adjustment and skills (Bruininks, Lewis, & Thurlow, 1990; Thurlow, Bruininks, & Lange, 1989; Thurlow, Bruininks, Wolman, & Steffens, 1989). Through the use of exploratory and confirmatory factor analysis, Bruininks, Thurlow, McGrew, and Lewis (1990) and McGrew, Bruininks, Thurlow, and Lewis (in press) reduced the pool of 142 interview items and selected ICAP service information items to the 12 composite community adjustment variables presented in Table 1. In this table, the variables are organized according to the four community adjustment factors validated in the McGrew, Bruininks, Thurlow, and Lewis (in press) confirmatory factor analysis study.

The four factors identified by McGrew, Bruininks, Thurlow, and Lewis (in press) were as follows:

**TABLE 1**  
**Description of Community Adjustment Variables**

<i>Variable</i>	<i>Description</i>
<b>Social Network/Integration:</b>	
Number of Friends	Number of friends reported
Variety of Friends	Additive Scale of: has special friends; peer friend; residence staff friend; teacher/boss friend; other friends; romantic friend; regular contact with same age person without disabilities
<b>Recreation/Leisure Integration:</b>	
Recreation/Leisure-Social	Additive scale of activities done in past 7 days: out to eat; visited a friend; party or dance; attended sporting event; attended movie, concert, or play
Recreation/Leisure-Formal and Community	Additive scale of activities done in past 7 days: visiting in community; attended religious service; club/organization meeting; participated in sports; activities in community
Recreation/Leisure- Informal and Home	Additive scale of activities done in past 7 days: played cards, games, or toys; music activities; hobbies; went to park or on walk; sat resting; TV, radio, or records; shopping; cut, paste, or paper activities; cleaning/maintenance; saw/talked to relatives
<b>Community/Economic Integration:</b>	
Income Support	Amount of social security and disability income received per month
Economic Independence	Additive scale of: pays income tax; receives medicare/medicaid; receives social security income; puts money in/out of savings account; has own checking account; employed
Earned Income	Amount of income earned per month
Daytime Activity Scale	Continuum scale: 7 = competitive employment; 6 = supervised/supported employment; 5 = school or volunteer; 4 = sheltered workshop; 3 = day/work activity center; 2 = day care; 1 = no formal program outside of home
Living Arrangement Scale	Continuum scale: 5 = living independently or with friends, spouse; 4 = apartment training or half-way house; 3 = living with family or relatives; 2 = group residence; 1 = institution, hospital, nursing home
<b>Need for Support Services:</b>	
Number of Limiting Factors	Count of factors that limit social activities (from ICAP Social and Leisure Activities)
Number of Support Services	Count of 13 different community support services being used (from ICAP Support Services)

*Note:* Variables were derived from a 142-question interview protocol and selected support service items from the *Inventory for Client and Agency Planning* (ICAP; Bruininks, Hill, Weatherman, & Woodcock, 1986).

- *Social Network/Integration*—the extent to which a person has developed an active social network.
- *Recreation/Leisure Integration*—the extent to which a person is actively involved in formal and informal recreation and leisure activities both at home and in the community.
- *Community/Economic Integration*—the extent to which a person is independent in the community in the areas of economics and income, daytime activities, and living arrangements.
- *Need for Support Services*—the extent to which a person needs a wide variety of services to function within the community.

### RESULTS

Canonical correlation procedures were used to explore the relation between the set of four

adaptive and three maladaptive variables and the four sets of community adjustment variables representing the dimensions of social network/integration, recreation/leisure integration, community/economic integration, and need for support services. Canonical correlation procedures, which examine the relation between two sets of variables when each set consists of at least two variables (Cooley & Lohnes, 1971; Thompson, 1984), were judged to be more appropriate than either the calculation of all pairwise correlations among measures of adaptive/maladaptive behavior and community adjustment variables, or the exploration of the linear relations between the adaptive/maladaptive variables and single community adjustment outcome variables through multiple regression.

Prior research with this data set (Bruininks, Thurlow, McGrew, & Lewis, 1990; McGrew, Bruininks, Thurlow, & Lewis, in press) indicated that the 12 community adjustment variables are best interpreted to represent four factors and should thus be combined into multidimensional criteria. In addition, factor analytic research with the same seven ICAP clusters in this and other studies has consistently found the four adaptive clusters to form a single adaptive dimension and the three maladaptive clusters to form a single maladaptive dimension (Bruininks, Thurlow, McGrew, & Lewis, 1988; McGrew & Bruininks, 1987; McGrew et al., in press). Both empirical and conceptual evidence suggest that canonical correlation procedures would best examine the relations between these sets of multivariate dimensions.

The purpose of the current study was to determine whether any significant relation existed among adaptive/maladaptive behavior and the community adjustment measures, and, if significant, to determine the degree of this relation. The following information was obtained from each canonical analysis: (a) canonical correlations and related statistics and (b) significant canonical variates and canonical loadings. Within each of the four community adjustment dimensions, three separate canonical analyses were performed:

1. Adaptive and maladaptive clusters with the respective community adjustment variables.
2. Adaptive behavior clusters with the respective community adjustment variables.
3. Maladaptive behavior clusters with the respective community adjustment variables.

The .01 significance level was used to evaluate the significance of the canonical results.

The results shown in Table 2 reveal a strong significant relation between the set of adaptive/maladaptive behavior variables and the set of community/economic integration variables. Canonical correlations of .74 were found between the set of community/economic integration variables and the sets of adaptive/maladaptive and adaptive behavior. The majority of the relation with the set of community/economic integration variables appears to result primarily from the adaptive behavior clusters. All adaptive behavior clusters loaded highly on the significant variate: the highest loading was for Community Living Skills (.98 and .99), and the lowest was Motor Skills (.72).

The maladaptive behavior clusters appeared to add little to the canonical correlation; but when they were used in isolation, this set of problem behavior measures displayed a significant relation (canonical correlation = .44) with the rest of community/economic integration variables. Across the two relevant analyses, the three maladaptive clusters displayed loadings at approximately the same level. The pattern of loadings for the community/economic integration variables on the three variates was similar to the pattern of factor loadings reported by McGrew, Bruininks, Thurlow, and Lewis (in press) for their Community/Economic Integration factor. There were higher loadings for the variables reflecting degree of economic independence (Economic Integration, Earned Income) and independence in work and residential living arrangements (Daytime Activity and Living Arrangement). These findings suggest that increasing levels of adaptive behavior are associated with increasing degrees of community/economic independence and integration.

The relations between the sets of adaptive and maladaptive clusters and the set of need for support variables are summarized in Table 3. All three canonical variates were significant. Similar to the results presented for community/economic integration, the largest canonical correlations were for the adaptive/maladaptive (.47) and adaptive only (.44) analyses. The adaptive behavior variables accounted for the majority of the relationship with the need for support variables. Again, the Personal Living Skills (.83, .90), Community Living Skills (.90, .98), and Social/Communication Skills (.84, .91) clusters loaded the highest on the significant variates. The Motor

**TABLE 2**  
**Summary Table of Canonical Correlations and Statistics: Community/Economic Integration**

Variable	Loadings on Significant Variate in Each Canonical Analysis		
	Adaptive and Maladaptive	Adaptive Only	Maladaptive Only
<b>ICAP<sup>a</sup> Adaptive and Maladaptive Variables:</b>			
Personal living skills	.80	.80	—
Community living skills	.98	.99	—
Social/communication skills	.85	.85	—
Motor skills	.72	.72	—
External maladaptive	.40	—	.82
Internal maladaptive	.42	—	.86
Asocial maladaptive	.39	—	.88
<b>Community/Economic Integration Variables:</b>			
Income support	.44	.46	.04
Economic integration	.97	.97	.74
Earned income	.84	.84	.67
Daytime activity	.79	.79	.54
Living arrangement	.56	.56	.88
<b>Canonical Summary Statistics</b>			
Canonical correlation	.74*	.74*	.44*
Chi-square	220.26	185.72	55.29
df	35	20	15

Note: This table represents three analyses of ICAP adaptive/maladaptive clusters with the community/economic integration variables.

<sup>a</sup>ICAP = *Inventory for Client and Agency Planning* (Bruininks, Hill, Weatherman, & Woodcock, 1986).

\*Indicates canonical correlations significant at .01 level.

Skills cluster contributed less (.62, .67) to the significant variates.

In contrast to the findings shown in Table 2, the three ICAP maladaptive behavior clusters loaded differentially on the two variates in which they were included. In both cases, the Asocial/Maladaptive cluster appeared to be most strongly related to the variate (.64, .92). When only the set of maladaptive behavior clusters were included in the analyses, the Asocial (.92) and Internal (.83) maladaptive clusters were most strongly associated with the variate, followed by the External (.67) maladaptive cluster. Because all variables were scaled so that higher scores indicated higher functioning or better community adjustment, this finding suggests that the need for community support services was less when the individual displayed lower levels of asocial and internally directed maladaptive behavior. More-

over, higher levels of adaptive behavior appeared to be most strongly related with lower needs for community support services.

The relations between the sets of adaptive or maladaptive clusters and the social network/integration variables were all significant (Table 4). Similar to the results presented for community/economic integration and need for support, the largest canonical correlations were for the adaptive/maladaptive (.38) and adaptive-only (.30) analyses. The adaptive behavior variables accounted for the majority of the relationship with the social network/integration variables. All four adaptive behavior clusters and both social network/integration variables loaded at or above .71 on the significant variate in the adaptive-only analysis. This suggests that higher levels of adaptive behavior are associated with a larger number and variety of social contacts. In the case of the

**TABLE 3**  
**Summary Table of Canonical Correlations and Statistics: Need for Support Services**

Variable	Loadings on Significant Variate in Each Canonical Analysis		
	Adaptive and Maladaptive	Adaptive Only	Maladaptive Only
<b>ICAP<sup>a</sup> Adaptive and Maladaptive Variables:</b>			
Personal living skills	.83	.90	-
Community living skills	.90	.98	-
Social/communication skills	.84	.91	-
Motor skills	.62	.67	-
External maladaptive	.45	-	.67
Internal maladaptive	.58	-	.83
Asocial maladaptive	.64	-	.92
<b>Need for Support Services Variables:</b>			
Number of limiting factors	.82	.79	.91
Number of support services	.89	.92	.80
<b>Canonical Summary Statistics</b>			
Canonical correlation	.47*	.44*	.34*
Chi-square	61.16	49.42	28.94
df.	14	8	6

Note: This table represents three analyses of ICAP adaptive/maladaptive clusters with the need for support services variables.

<sup>a</sup>ICAP = *Inventory for Client and Agency Planning* (Bruininks, Hill, Weatherman, & Woodcock, 1986).

\*Indicates canonical correlations significant at .01 level.

maladaptive only analyses, the loadings suggest that less external (.53) and internal (.58) maladaptive behavior may be associated with a larger variety of friends (.87).

In the area of recreation/leisure integration (Table 5), significant canonical correlations were found with the adaptive behavior clusters either alone (.27) or in combination with the maladaptive behavior clusters (.30). No significant canonical variate was found with the set of maladaptive behavior clusters. For the two significant variates reported in Table 5, all adaptive behavior cluster loadings were at or above .71, while the Recreation/Leisure-Social variable loaded the highest on the variates (.78 and .82), followed by Recreation/Leisure-Informal and Home (.44 and .32). These results suggest that higher levels of involvement in social and informal recreation/leisure activities are associated with higher levels of adaptive behavior. The variable that reflected organized activities in the community (Recre-

ation/Leisure-Formal and Community) displayed negative loadings (-.33 and -.32) on both variates. Although the negative loading was unexpected, the relative pattern of the Recreation/Leisure integration variable loadings is similar to the factor loadings reported by McGrew, Bruininks, Thurlow, and Lewis (in press). These findings suggest that these three recreation and leisure variables may not represent a homogeneous dimension. Thus, it might be more appropriate to not include them in the same set in future multivariate analyses.

## DISCUSSION

The results of this investigation indicate that measures of adaptive and maladaptive behavior from the ICAP are significantly related to measures of community adjustment for people with mild to severe degrees of retardation. Through the use of canonical correlation procedures, the combined Personal Living Skills, Community

**TABLE 4**  
**Summary Table of Canonical Correlations and Statistics: Social Network/Integration**

Variable	Loadings on Significant Variate in Each Canonical Analysis		
	Adaptive and Maladaptive	Adaptive Only	Maladaptive Only
<b>ICAP<sup>a</sup> Adaptive and Maladaptive Variables:</b>			
Personal living skills	.74	.94	—
Community living skills	.75	.95	—
Social/communication skills	.72	.92	—
Motor skills	.58	.71	—
External maladaptive	.14	—	.53
Internal maladaptive	.20	—	.58
Asocial maladaptive	-.23	—	-.09
<b>Social Network/Integration Variables:</b>			
Variety of friends	.86	.75	.87
Number of friends	.92	.97	.10
<b>Canonical Summary Statistics</b>			
Canonical correlation	.38*	.30*	.23*
Chi-square	42.81	22.68	16.63
df	14	8	6

*Note:* This table represents three analyses of ICAP adaptive/maladaptive clusters with the social network/integration variables.

<sup>a</sup>ICAP = *Inventory for Client and Agency Planning* (Bruininks, Hill, Weatherman, & Woodcock, 1986).

\*Indicates canonical correlations significant at .01 level.

Living Skills, and Social/Communication Living Skills clusters, and, to a lesser extent, the Motor Skills clusters, were highly related (canonical correlation = .74) with concurrent measures of community/economic integration. Although not as strong, a combination of four adaptive behavior clusters was also significantly related (canonical correlation = .44) with measures reflecting an individual's need for community support services. These findings support a strong association between the ICAP adaptive behavior clusters and successful integration in the community, as defined by economic independence, independence in daytime activities and living arrangements, and independence from community support services. These findings suggest that the ICAP adaptive behavior clusters can provide useful information for program planning, decision making, and program evaluation for people with retardation.

Canonical correlations between the four adaptive behavior clusters and measures of social net-

work and recreation/leisure integration, although significant, were much lower (.30 and .27). This suggests that, by themselves, the adaptive behavior measures are not strongly associated with the activity levels of people with retardation in social and recreation/leisure activities in the community. Many social and leisure-recreation activities for persons with mental retardation may be highly structured and supervised, leaving little opportunity for the expression of preferences or the application of abilities. Other environmental or personal competence variables need to be considered in combination with adaptive behavior measures when formulating program plans or making decisions related to these two important areas of community adjustment. The correlation magnitudes do not support making individual predictions in these two areas. The presence of significant canonical correlations, however, suggests that adaptive behavior measures should be included in research that seeks to understand how different personal competence and environmen-



**TABLE 5**  
**Summary Table of Canonical Correlations and Statistics: Recreation/Leisure Integration**

Variable	Loadings on Significant Variate in Each Canonical Analysis**		
	Adaptive and Maladaptive	Adaptive Only	Maladaptive Only
<b>ICAP<sup>a</sup> Adaptive and Maladaptive Variables:</b>			
Personal living skills	.76	.84	-
Community living skills	.81	.93	-
Social/communication skills	.89	.99	-
Motor skills	.71	.79	-
External maladaptive	.08	-	-
Internal maladaptive	.51	-	-
Asocial maladaptive	.06	-	-
<b>Recreation/Leisure Integration Variables:</b>			
Recreation/leisure-social	.78	.82	-
Recreation/leisure-formal and community	-.33	-.32	-
Recreation/leisure-informal and home	.44	.32	-
<i>Canonical Summary Statistics</i>			
Canonical correlaton	.30*	.27*	.19
Chi-square	37.63	30.46	10.51
df	21	12	9

Note: This table represents three analyses of ICAP adaptive/maladaptive clusters with the recreation/leisure integration variables.

<sup>a</sup>ICAP = *Inventory for Client and Agency Planning* (Bruininks, Hill, Weatherman, & Woodcock, 1986).

\*Indicates canonical correlations significant at .01 level. \*\*Loadings not reported for analyses where no significant canonical variate was identified.

tal variables interact in contributing to the social and recreation/leisure integration of people with mental retardation.

The stronger relation of measures of adaptive behavior with community independence (community/economic integration and need for support variables) than with measures of social and recreation/leisure integration likely reflects an interaction between the level of adaptive functioning and environmental variables. The generation of income and management of one's own finances, freedom from support services, and involvement in more independent employment settings most likely require higher levels of adaptive functioning. A person will most likely not be placed in or hired for a wage-earning job, or manage personal finances without assistance, if certain prerequisite skills do not exist or are not possible to develop. Successful community ad-

justment in these areas is more likely related to the person's level of adaptive functioning.

In contrast, many people in this sample lived in special residences (e.g., group homes) where group social and recreation/leisure activities typically are organized by the residence staff for all clients in the residence (Bruininks, Lewis, & Thurlow, 1990; Thurlow, Bruininks, & Lange, 1989; Thurlow, Bruininks, Wolman, & Steffens, 1989). Thus, all residents of a group home may take a bus to a baseball game, accompanied by staff, requiring only a minimal level of personal choice or adaptive functioning for an individual to participate. This emphasis on a minimal level of functioning would attenuate any correlation between measures of adaptive functioning and extent of involvement in social and recreation/leisure activities. Since the social and recreation/leisure measures used in this investiga-

tion only assessed the frequency of involvement, and not the actual degree of success or quality of experience in these areas, people with varying degrees of adaptive behavior may have similar frequency of involvement because of their participation in organized group activities. This could explain the significantly lower canonical correlations found between adaptive behavior and social and recreation/leisure integration in the current study. With recreation-leisure programs providing greater personal choice and integrated options, relationships may increase between measures of adaptive behavior and these aspects of community adjustment in future studies.

Maladaptive behavior was found to be significantly related to community/economic integration (canonical correlation = .44), need for support services (.34), and social network integration (.23). The relatively low to moderate level of these canonical correlations, together with the lack of a significant relation in the recreation/leisure area, suggests a weaker relation between maladaptive behavior and community adjustment than is typically reported in the literature. Prior research has suggested a link between problem behaviors and decreased opportunities for personal development and social or community integration (Bruininks, Hill, & Morreau, 1988; Hill & Bruininks, 1981, 1984). In addition, socially inappropriate behaviors are believed to be highly instrumental in the occurrences of institutionalization (Maney, Pace, & Morrison, 1964; Spencer, 1976), reinstitutionalization (Hill & Bruininks, 1984; Keyes, Boroskin, & Ross, 1973; Pagel & Whitling, 1978; Sutter, Mayeda, Call, Yanagi, & Yee, 1980), and lowered job status (McCarver & Craig, 1974; Schalock, Harper, & Carver, 1981). The weaker association in this study may result from the relatively narrow range of maladaptive behavior demonstrated by the subjects and the limited range of social and recreation-leisure measures of community adjustment.

Descriptive statistics (Bruininks, Thurlow, McGrew, & Lewis, 1990) for the three ICAP maladaptive behavior clusters, which have a normative mean of zero and standard deviation of 10, revealed that only the subgroup with severe retardation ( $n = 104$ ) displayed a level of maladaptive behavior that consistently approached a value close to 1 standard deviation below the mean (Externalized = -7.1, Internalized = -10.1, Asocial = -11.5). The means for the other subgroups ranged from -0.9 to 1.5 (mild) and -8.6

to -4.0 (moderate). The possibility exists that the maladaptive behavior clusters may display a stronger relation with community adjustment measures in samples displaying greater ranges of problem behaviors.

The combined adaptive/maladaptive analysis with community/economic integration (Table 2) and need for support services (Table 3) provides support for integrating the constructs of adaptive and maladaptive behavior. This type of integration is used to generate two measures in the ICAP, the Service Score and the Service Level. The ICAP Service Score is composed of a weighted combination of adaptive behavior and maladaptive behavior, and ranges from 0 to 100 with corresponding Service Levels ranging from 1 to 9 (Bruininks et al., 1986). These two service scores are intended to provide an overall measure of a person's need for care, support, supervision, or training. The construction of the Service Score was based on stepwise regression procedures with levels of residential and daytime placement as the criteria (Bruininks et al., 1986). The relative magnitude of the adaptive (.62 to .98) and maladaptive (.39 to .64) canonical loadings in Tables 2 and 3 provide independent validation of the differentially weighted ICAP Service Score and differentially Service Level. The ICAP Service Score and Service Levels would appear to be useful indexes for program planning and decision making related to a person's potential for successful community adjustment as defined by community/economic integration and need for support services.

The current investigation indicates that the ICAP measures of adaptive behavior, and to a lesser extent maladaptive behavior, provide important information for planning and evaluating essential aspects of community integration and adjustment for people with mental retardation. The inclusion of measures of adaptive and maladaptive behavior in assessment batteries for individuals with retardation appears to be important, not only for eligibility decisions, but for programmatic decision making, planning, training, and support strategies.

The results of this investigation provide support for the criterion-related validity of the ICAP adaptive and maladaptive behavior clusters as useful measures in understanding aspects of community adaptation and participation. Several limitations, however, should be addressed in future research. The simultaneous collection of the adaptive/maladaptive and community adjust-

ment information limits the generalizability of the results to concurrent predictions. Replication of this study in a longitudinal context, where adaptive/maladaptive measures are administered before people with retardation make important transitions (e.g., leaving public school special education programs, exiting residential facilities), and where the community adjustment measures are collected 1 or more years later, would provide important information on predicting later community adjustment. Replication of this study in both concurrent and longitudinal frameworks with other samples, some with a greater range of maladaptive behavior, is needed.

In any future replication or cross-validation, attention should be given to the use of additional or different measures of community adjustment. For example, in the areas of recreation/leisure integration and social network, measures that reflect the quality of success an individual experiences in these areas would add important information to the current measures of friendships and frequency of recreation/leisure involvement. The addition of measures of other community adjustment dimensions such as quality of life and personal satisfaction also is suggested.

Finally, measures of other personal competencies (e.g., physical/developmental, conceptual/academic, and social skills), together with adaptive and maladaptive behavior, are needed in studies that examine the relations between personal competencies and community adjustment. If conducted in a longitudinal framework that uses models of both personal competence (Greenspan, 1979, 1981a, 1981b; McGrew & Bruininks, 1990) and community adjustment (Bruininks et al., 1988; Halpern et al., 1986; McGrew, Bruininks, Thurlow, & Lewis, in press), such research could provide critical insights into understanding the relative validity of personal competence measures as they relate to predicting successful community adjustment. In addition, such research could provide important information to guide the development of training and intervention to improve the range of choices, integration, and quality of life for persons with mental retardation.

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