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Many countries, especially those with a history of colonization and exploitation, have experienced significant social interventions through the implementation of educational and economic programs. These programs often aim to improve access to education and economic opportunities, particularly for marginalized communities. However, the effectiveness of these interventions can vary depending on the context and the approach used.

**Need for Support Services**

In many countries, especially those with a history of colonization and exploitation, support services are necessary to facilitate access to education and economic opportunities. These services may include scholarships, vocational training programs, and other forms of assistance. The goal is to ensure that individuals from marginalized communities have equal access to these opportunities.

**Recreational/Ecological Integration**

In recent years, there has been a growing interest in the integration of recreational and ecological activities. These activities can provide opportunities for community members to connect with nature, engage in outdoor recreation, and enjoy the benefits of a healthy environment.

**Community and Economic Integration**

In the context of economic activities, the integration of community and economic development is crucial. This involves creating opportunities for economic growth while also ensuring that the benefits are distributed fairly. Strategies may include the promotion of local businesses, the development of infrastructure, and the implementation of policies that support economic equality.

**Social Network Integration**

The integration of social networks is essential for the successful implementation of social interventions. This includes the development of partnerships between government agencies, non-governmental organizations, and community groups. These partnerships can help to ensure that social interventions are designed and implemented in a way that is responsive to the needs of the community.

**Conclusion**

In conclusion, the integration of educational, economic, recreational, and social networks is essential for the success of social interventions. By creating opportunities for community members to access education, economic growth, recreation, and social networks, we can help to reduce disparities and promote a more equitable society.
A study on the neurobehavioral effects of volume design (MANOVA)

Dana Andrews

The study was designed to determine whether differences in community dispersion exist.

Procedures

The study was conducted in two phases: phase 1 and phase 2. In phase 1, participants were randomly assigned to three groups: low, medium, and high volume design conditions. The participants were exposed to these conditions for a period of 10 weeks. In phase 2, the participants were re-exposed to the same conditions but for a different period of 10 weeks. The outcome measures included neurobehavioral functioning and cognitive performance. The results indicated significant differences in neurobehavioral functioning across the volume design conditions.

Results

The results showed that the high volume design condition led to significant improvements in neurobehavioral functioning compared to the low and medium volume design conditions. The medium volume design condition also showed significant improvements compared to the low volume design condition. These findings suggest that volume design can have a significant impact on neurobehavioral functioning.

Method

The study was conducted using a randomized, double-blind, placebo-controlled design. The participants were randomly assigned to one of the three volume design conditions. The outcome measures included neurobehavioral functioning, cognitive performance, and subjective reports of discomfort. The results were analyzed using MANOVA and multiple regression analyses. The analyses revealed significant differences in neurobehavioral functioning and cognitive performance across the volume design conditions.
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 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 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 variables 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 $\eta^2(1 - A)$ 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 $(-.203)$, 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 ±.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-

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### Table 2

<table>
<thead>
<tr>
<th>Discriminant Variable</th>
<th>Severe/Profound</th>
<th>Moderate</th>
<th>Mild</th>
<th>Levels of Classification</th>
<th>Structure Coefficients</th>
<th>Standardized Weights</th>
<th>Severe/Profound M</th>
<th>Severe/Profound SD</th>
<th>Moderate M</th>
<th>Moderate SD</th>
<th>Mild M</th>
<th>Mild SD</th>
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</thead>
<tbody>
<tr>
<td>Social network integration</td>
<td>3.40</td>
<td>4.36</td>
<td>2.80</td>
<td>1.26</td>
<td>Recreation/leisure - formal</td>
<td>3.60</td>
<td>3.63</td>
<td>2.40</td>
<td>1.36</td>
<td>1.07</td>
<td>0.31</td>
<td>0.14</td>
</tr>
<tr>
<td>Recreation/leisure — informal</td>
<td>2.30</td>
<td>1.06</td>
<td>3.00</td>
<td>1.36</td>
<td>Recreation/leisure — informal</td>
<td>2.30</td>
<td>1.06</td>
<td>3.00</td>
<td>1.36</td>
<td>1.07</td>
<td>0.31</td>
<td>0.14</td>
</tr>
</tbody>
</table>
services, 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.

REFERENCES


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