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PEER RELATION IN CHILDREN WITH ADHD

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ABSTRACT

Peer relation is found to be the powerful predictor to the social adjustment in adulthood of people with disabilities. However, children with ADHD are often referred to the clinic with poor social relations. The study is to explore the peer relations of six-graders with ADHD and to investigate the predictors to the peer acceptance and rejection of children with ADHD. 85 children were identified with ADHD by using Pelham's Attention Deficit／Hyperactivity Subscale and the criteria of the DSM-III-R. Teacher rating scale, self-rated interpersonal relation scale and self-concept scale, and sociometric measurement were used to collect data. Five major findings of this study were found: (a) children with ADHD were found to have poor social relation from measurements based on teachers', peers', or their own viewpoints; (b) children with ADHD had poor social adustment, from teachers', peers' or their own viewpoints; (c) peer nominated peer acceptance and rejection was better related to teached rating unsociability than to self-ratedpeer relations; (d) peer-nominated withdrawal and teacher-rated unsoicability were negatively related to peer acceptance, but peer-nominated hyperactivity was positively related; peer-nominated aggression and withdrawal and teacher-rated conduct problem, hyperactivity, unsociability, inattention, and impulsivity were positively related to peer rejection; and (e) withdrawal nominated by peers was found to be the most powerful predictor to peer acceptance, and aggression and withdrawal nominated by peer and unsocialbility from teacher rating scale were found to be powerful predictors to peer rejection. According to these findings, suggestions for interventions and research were made.

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ADAPTIVE BEHAVIOR OF THE MENTALLY RETARDED IN TAIWAN, ROC

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ABSTRACT

The main purpose of this study was to examine the adaptive behavior of the mildly and moderately mentally retarded students in Taiwan, ROC. Two main focuses were: (a) to find out the structure and pattern of adaptive behavior of the mentally retarded in comparison to those of the normal children; (b) to examine the relationship between intelligence and adaptive behavior for verifying the need of using an adaptive behavior measure during the identification procedure. A total of 368 mentally retarded elementary and junior high students and 541 norm sample from grade one to grade seven participated in this study. The newly revised Chinese Version of the Vineland Adaptive Behavior Scale -- Classroom Edition and the Chinese Version of the WISC-R Scale were used as instruments. Obtained data were analyzed by using factor analysis, cluster analysis, t-test for independent groups, Pearson correlation, regression analysis, and contingency tables. The following were the main findings: (a) Adaptive behavior is a two-dimensional structure for both the normal and mentally retarded students. Cognition and Psychomotor are the two main factors; (b) The profile typology of the mentally retarded is different from the core profile typologies of the normal children. The most deficit subdomain of the mentally retarded is Written, followed by Expressive and Community and the most deficit domain is Communication; (c) The adaptive behavior performances of the mentally retarded were lower than those of the normal students whereas the adaptive behaviors of the mildly retarded were higher than those of the moderately retarded; (d) Low to moderate relationships were found between intelligence and all domains', subdomains', and total scale scores on VABS-CE and only 8% to 26% of the adaptive behavior could be predicted from intelligence; (e) 28 students were misidentified as mentally retarded by adding adaptive behavior as another criterion besides intelligence, therefore, adaptive behavior measure is needed during the identification procedure. The limitations and suggestions also were discussed for future plementations.

INTRODUCTION

Adaptive behavior is an important indicator of a person's adjustment to society. It can be described as the ability to manage the social and physical environment (Coulter & Marrow, 1978; Grossman, 1977). Persons whose social awareness and learning are impaired are usually impaired in adaptive skills as well (Loveland & Kelley, 1988). Adaptive behaviors may be more closely related to vocational success and level of independence than academic achievement. Adolescents whose adaptive skills lag behind other skills seem especially at risk for not reaching their adult potential. An important long-term educational goal for the mentally retarded is social integration by cultivating independent living skills.

Measurement of adaptive behavior has become an integral part of the assessment of handicapped persons (Coulter & Marrow, 1978). In the United States, P. L.94-142 requires that deficits in adaptive behavior be substantiated before a child is classified as mentally retarded. Furthermore, it recognizes the importance of adaptive behavior for children with handicaps other than mental retardation. Currently, adaptive behavior assessment is routine before a person is classified as mentally retarded.

Basically, the development of special education in Taiwan, the Republic of China follows the steps of the United States. In Taiwan, according to the 1984 Special Education Law of the Republic of China and its regulations, children with IQs below 2 standard deviations from the mean on an individual IQ test, and with adaptive behavior below the 25th percentile rank on any social adaptive behavior subscale are classified as mentally retarded. Until now, the identification procedure mainly focused on the IQ test. Also, the only adaptive behavior scale used, the Revised AAMD Adaptive Behavior Scales for Children and Adults (AAMD ABS) (Sheu, 1983), is time-consuming, subjective, and unsuitable for the mildly retarded. Research also indicated that, on the adaptive behavior scales, parents rated their children higher than did teachers (Britton & Eaves, 1986; Heath & Obrzut, 1984; Soyster & Ehly,1986). Therefore, the Special Education Center of National Taiwan Normal University decided to revise the Vineland Adaptive Behavior Scale-- Classroom Edition (Sparrow, Balla, & Cicchetti, 1984), a teacher-rating scale, for the identification of mildly retarded students.

The Chinese Version of the Vineland Adaptive Behavior Scale-Classroom Edition (VABS-CE) was completed in 1990 (Wu, Lu, Chang, & Chiu). The content is similar to the original version (Sparrow, Balla, and Cicchette, 1984) with some revision to adapt to the Chinese culture. It contains four domains: Communication, Daily Living Skills, Socialization, and Motor Skills. These domains are divided into 11 subdomains: Receptive, Expressive, Written, Personal, Domestic, Community, Interpersonal Relationships, Play and Leisure Time, Coping Skills, Gross, and Fine Motor Skills.

The main purpose of this study is to explore the application of this newly developed VABS- CE to the mildly and moderately retarded. It is assumed that adaptive behavior deficits of the mentally retarded are a result of intellectual dysfunction. Much research in this area indicates a positive relationship between IQ and adaptive behavior (Childs, 1982; Gould, 1975; Harrison, 1990; Heath , 1984). Several investigations have examined the relationship between the Vineland Adaptive Behavior Scale and measures of intelligence. The correlations between the Survey Form or Classroom Edition and various measures of intelligence were generally low to moderate for samples of normal children, behaviorally disordered children, and institutionalized mentally retarded adults (Arffa et al., 1984; Durham, 1982; Guidubaldi, Cleminshaw, Perry, & Kehle, 1983; Harrison, 1985; Harrison & Ingram, 1984; Harrison & Kamphaus, 1984; Kopp, Rice, & Schumacher, 1984; Mealor & Olson, 1986). Recent research of using Vineland Adaptive Behavior Scale-- Classroom Edition (Harrison et al., 1990) suggests that a low to moderate relationship between intelligence and adaptive behavior for mildly retarded students. They also found that the mean VABS- CE for TMR children was significantly lower than for EMR children and that the means for daily living skills and socialization domains on VABS- CE were in the moderately low range for EMR children.

In Taiwan, however, little research has examined this area. As cultural differences exist or may interact, it is interesting and necessary to find out the relationships between IQ and adaptive behavior for verifying the need of using an adaptive behavior during the identification procedure.

The profile typology and pattern of adaptive behavior (i.e., the most deficit domain and subdomain) are also the researcher's interest. Since VABS-CE will be broadly used as a classification instrument in mental retardation, the classification of mentally retarded individuals , based on the patterns of performance in adaptive behavior, is important to generate classification systems. In an authoritative literature review of the construct of adaptive behavior from 1965 to 1979, Meyers, Nihira, and Zetlin (1979) concluded that a two-dimensional structure, with functional autonomy and responsibility, as the factors that would universally be determined in any competent studies employing the usual broad-ranged adaptive behavior scale. However, most of the studies reviewed by Meyers et al. used the AAMD ABS (Nihira, Foster, Shellhaas. & Leland, 1969) with institutionalized mentally retarded samples. Findings in some additional studies using different adaptive behavior instruments and subjects identified that adaptive behavior is a single-factor solution (Doll, 1966; Hug, Barclay, Collins, & Lamp, 1978; Katz-Garris, Hadley, Garris, & Barnhill, 1980; Arndt, 1981; Millsap, Thackrey, and Cook,1987; Mercer, 1979). Song et al. (1984) identified two factors, Cognition and

Psychomotor, in the Wisconsin Behavior Rating Scale (Song et al., 1980) in samples with and without retardation. The former is similar to the autonomy factor identified by Meyers et al. (1979), however, the latter is inconsistent with Meyers et al.'s Responsibility factor. Other studies on comprehensive assessments of adaptive behavior (Guarnaccia, 1976; Owens & Bowling, 1970; Sparrow & Cicchetti, 1978,1984; Widaman, Gibbs, & Geary ,1987) tended to find two or four factors to be sufficient to describe forms of adaptive behavior. In factor analyses reported in the manual of the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchette, 1984), Sparrow et al. found three common factors sufficient to describe correlations among Vineland Adaptive Behavior Scales subdomain scores. Harrison (1985) conducted factor analyses for Vineland Adaptive Behavior Scales' domains and subdomains and found the domains produced one significant factor, as a measure of general adaptive behavior, and the subdomains generally confirmed the organization into their respective domains. Bruininks, McGrew, and Maruyama (1988) concluded that adaptive behavior factor analytic research does not appear to show any difference in the structure of adaptive behavior as a function of degree of mental retardation or presence or absence of retardation.

In the classification area, profiles of handicapped individuals on the Vineland Adaptive Behavior Scale indicated that groups expected to have different levels of adaptive behavior from those of normal individuals did demonstrate these differences (Harrison, 1990). Investigations indicated that the following groups have a lower level of performance than the national standardization sample on the Vineland Survey Form: institutionalized mentally retarded adults (Childers & Bolen, 1985), mentally develop delayed preschoolers (Harrison & Ingram, 1984), and developmentally handicapped children (Ronka, 1984). Similar findings were reported for the Classroom Edition, behaviorally disordered (Mealor & Olson, 1986) and developmentally handicapped children (Ronka, 1984) exhibited lower performance than the Classroom Edition standardization sample. In other measurement instruments, Dunlap (1987) investigated the classification of mentally retarded persons based on independent living skills. He performed a cluster analysis of the scores of 106 subjects on seven instruments and obtained a solution with three clusters arranged from low to high functioning level. Silverstein, Lozano, and White (1989) investigated the classification of institutionalized mentally retarded individuals based on patterns of performance in an adaptive behavior measure, Client Development Evaluation Report (California Department, 1986), and found a three-cluster solution that proved highly stable across clustering methods, subjects samples, and time points. The findings also indicated cluster member ship is meaningfully associated with a number of demographic characteristics and neurological and sensory handicaps. In this study, the researcher compares the structure and profile typology of the adaptive behavior of the mentally retarded group with those of the normal group to check the construct validity of VABS-CE and the differences between these two groups. With this information, we can manipulate the environment to remedy their deficits and create appropriate adaptive behaviors for the mentally retarded.

Following are the main research questions:

1. Are there significant differences between the adaptive behavior of the mentally retarded and normal children? That is, is the structure of adaptive behavior for the mentally retarded different from that for normal students? Is there any unique profile typology on mentally retarded students' adaptive behavior in comparison to the core profile typologies on the normal students'?

2. Is there any relationship between adaptive behavior and IQ of the mentally retarded? Can we use IQ to predict adaptive behavior? Does adaptive behavior need to be a criterion for classification of mental retardation besides intelligence?

In this study, the researcher defiend the following terms:

1. Mentally retarded: elementary and junior high students with IQ range from 69 to 40 (between M-2SD and M-4SD of WISC-R Scale).

2. Mildly retarded (EMR): elementary and junior high students with IQ range from 69 to 55 (between M-2SD and M-3SD of WISC-R Scale).

3. Moderately retarded (TMR): elementary and junior high students with IQ range from 54 to 40 (between M-3SD and M-4SD of WISC-R Scale)

4. Normal students: students studying at the regular settings in elementary and junior high schools (grade 1 to grade 7).

5. Adaptive behavior: Scores obtained from the Chinese Version of the Vineland Adaptive Behavior Scale--Classroom Edition.

6. IQ: Scores obtained from the Chinese Version of the WISC-R Scale.

METHODOLOGY

Subjects

A total of 368 mentally retarded students from grade 1 to grade 9 in elementary and junior high self-contained special classes participated in this study. The researcher randomly selected 3 subjects with IQ's ranging from 69 to 40 from each of 130 schools (74 elementary schools and 56 junior high schools).

Of the 130, 65 schools were in the northern part, 27 in the central part, and 38 in the southern part of Taiwan based on the proportion of the 1989 Taiwan Census.

In addition, to compare the structure and profile typology of the adaptive behavior between mentally retarded and normal students, 258 of the above 368 mentally retarded subjects from grade 1 to grade 7 and 541 normal students from grade 1 to grade 7 of the norm sample were used. The norm sample was also randomly selected and designed to be representative of the Taiwan population by stratification according to age, gender, geographic region,

and urban versus rural residence. Table 1 indicates the mentally retarded sample used in this study.

Table 1. Sampling Distribution for Assessment of Adaptive Behavior of Mentally Retarded Students

	EMR	TMR	Total
Elementary	110	88	198
Junior High	113	57	170
Total	223	145	368

Instrumentation

Chinese Version of the Vineland Adaptive Behavior Scales-Classroom Edition (VABS-CE)

VABS-CE was standardized using a representative normal sample of 800 students covering kindergarten through the seventh grade. The students' ages ranged from 3-11 to 12-11 years and 80 subjects were included in each of the 10 age groups. The VABS-CE contains 242 items within 4 domains and 11 subdomains. Each item may be scored 2,1, or 0, so the raw score of each child may range from 484 to 0. It is a teacher-rating scale with approximate 20 minute administration time for each student. Since the norm has not been standardized yet, raw score and z score are used in this study.

Chinese Version of the WISC-R Scale

This test was translated and revised from the WISC-R scale (Wechsler, 1974) to cope with the Chinese culture by Chen et al. (1980). Twelve subtests as in the original scale yield Verbal IQ, Performance IQ, and Total IQ scores. The norm was set up with children's age from 6-0 to 15-11. The Split--half -- internal consistency reliabilities range from .90-.96. The test-retest reliabilities for two age groups are .91 and .95. The concurrent criterion-related validities with Chinese Version of the Stanford Binet Intelligence Scale are .83 and .89. All of the above reliabilities and validities reached the statistically significant level. It is an individual IQ test. The testing time for each subject is about 1.5 hour.

Procedure

The researcher conducted three half-day workshops on introduction and implementation of the Vineland Adaptive Behavior Scale-Classroom Edition (VABS-CE) in northern, central, and southern parts of Taiwan. The 130 schools appointed one experienced teacher to attend the workshop held in May, 1990. Because students already were administered the WISC-R Scale while entering the self-contained special class program, the researcher only asked the teachers to fill in the student's WISC-R IQ scores on the Vineland Adaptive Behavior Scale Recording Form. Then, the researcher asked these teachers to teach other home room teachers to administer the VABS-CE Scale after they returned to their schools.

For the normal sample, each elementary school chose six students whose seat numbers were 25 in the 6th classroom of each grade (grade 1 to grade 6) and each junior high school chose two 7th grade students whose seat numbers were 35 in the 2nd classroom and in the 6th classroom. During this sampling procedure, the ratio of male and female also was considered to include approximately equal number of both boys and girls as subjects. For the mentally retarded students, each elementary school chose 3 students each from primary (grade 1 to 2), intermediate (grade 3 to 4), and high (grade 5 to 6) grade whose IQ ranged from 69 to 40 and each junior high school chose 3 students from each grade (grade 7 to 9) with the same IQ range as required by the elementary level. The above data were sent to the researcher within two weeks. After the data had been collected, the researcher input them into the computer and used SPSSX software to analyze them.

Statistical Analysis of the Data

Subjects' scores on VABS- CE including domains, subdomains, and total scale were gathered. In addition, IQ scores from WISC-R also were gathered to answer the research questions. Following described the procedures of analyzing each set of data :

1. Using factor analysis compared the differences between the factors of VABS-CE in mental retardation and those in normal group to examine the structure or dimension difference between these two groups.

2. Using sequential minimum-variance cluster analysis the classification effect of VABS - CE and the domains' and subdomains' relationships were examined to compare the profile typology on adaptive behaviors of the mentally retarded with the core profile typology of normal children.

3. Using t - test for independent groups examined the differences between all VABS- CE scores of the normal group and those of the mentally retarded group. Then, using the same procedure the differences between the VABS-CE of the mildly retarded group and those of the moderately retarded were examined. Finally, another t-test were performed to examine the differences between the VABS-CE of the low adaptive behavior function group of the core profile typologies and those of the mentally retarded group.

4. Using Pearson correlation analysis examined the relationship between IQ and adaptive behaviors of the mentally retarded, then using regression analysis explored the prediction effect. In addition, using contingency tables to show the number of subjects whose IQ are below 2SD from the mean and scores on VABS-CE subscales are below 25th percentile rank checked whether the intelligence and adaptive behavior were different from each other and, if using both criteria, how many students should be excluded from the label of mental retardation.

RESULTS

Structure and Pattern of Adaptive Behavior

Separate factor analyses were performed for the normal, mildly retarded, moderately retarded, and whole retarded groups. The correlation matrices were

submitted to principle components factor analysis. A varimax rotation was performed on all factors satisfying Kaiser's criterion, unrotated factors with an eigenvalue greater than 1.0.

Table 2 indicates the factor analysis results of the four groups. Interpretation of the rotated factors was based on the variables with a factor loading of .50 or greater.

The cluster result of total 799 subjects from grade 1 to grade 7 (Normal = 541; MR=258) found a two-cluster solution: one could be identified as high adaptive behavior function group (n=572), the other could be classified as low adaptive behavior function group (n=227). In comparison to the actual number of the normal group (n=541) and the MR group (n=258), it seemed pretty close to the cluster results that the normal group might have high adaptive function and most of the MR group might be in the low adaptive behavior function group. In an advanced analysis (see Table 3), it was found that the performances on VABS- CE of 86 subjects in the MR group were in the high adaptive behavior function group, who might not be identified as mental retardation by including adaptive behavior as a criterion of classification. Also, 55 subjects in the normal group were in the low adaptive behavior function group which indicated that adaptive behavior is somewhat different from intelligence and that people with average intelligence may have adaptive behavior deficiencies.

Table 2. Summary of the Rotated Two-Factor Solutions Across the Four Samples

				MR Group								
	Normal Group			EMR			TMR			Totl		
Subdomain	I	II	Comm.	I	II	Comm.	I	II	Comm.	I	II	Commm.
Receptive	.35	.63	.52	.41	.46	.38	.47	.20	.58	.61	.28	.46
Expressive	.59	.59	.70	.65	.47	.64	.83	.11	.69	.78	.28	.68
Written	.37	.42	.70	.80	.07	.64	.80	.00	.64	.82	.05	.67
Personal	.49	.52	.51	.47	.54	.52	.51	.65	.68	.49	.60	.60
Domestic	.86	.11	.75	.68	.34	.58	.63	.38	.54	.67	.37	.58
Community	.78	.39	.76	.83	.34	.81	.85	.22	.77	.85	.30	.81
Interper-sonal Rela.	.71	.41	.68	.73	.37	.66	.77	.33	.70	.77	.35	.71
Play & Lei	.74	.33	.65	.73	.42	.70	.68	.40	.63	.73	.41	.70
Coping	.83	.22	.74	.78	.16	.63	.71	.15	.52	.75	.15	.59
Gross	.11	.78	.62	.07	.93	.87	.03	.87	.76	.10	.92	.85
Fine	.29	.81	.74	.34	.82	.79	.20	.83	.73	.32	.81	.75
Eigenvalue	4.43	2.95		4.40	2.84	4.86	2.40		4.87	2.56		
% of total variance	40.3	26.8	67.1	40.0	25.8	5.8	44.2	21.8	66.0	44.3	23.3	67.6
% of trace (common variance)	60.0	40.0	100	60.8	39.2	100	66.9	33.1	100	65.5	34.5	100

Note: Loading greater than .50 are in Bold.

Table 3. Number of Subjects in the Two-Cluster Solution of VABS-CE for Total Subjects

	Cluster I High function	Cluster II Low function	Total
Normal Group	486	55	541
MR Group	86	172	258
Total	572	227	799

To examine the typologies, z scores with the same means and standard deviations of each subdomains, domains on VABS- CE (N=799) were used to draw the profile typologies of the normal, MR, and two cluster groups. Table 4 indicates the means and standard deviations of the raw scores and z scores on VABS- CE for these four groups. In table 4, it was found that the means on all VABS- CE scores in the normal group were slightly lower than those of the cluster I-- high adaptive behavior function group and that the MR group's means were commonly higher than those of the cluster II--low adaptive behavior function group. Figure 1 showed these four profile typologies. From the profile typologies, the patterns of the normal group and cluster I group were similar, whereas the patterns of the MR group and cluster II group had slight differences in that the MR group's performances on Expressive, Personal, Domestic, Community, Interpersonal Relationship, Play and Leisure Time, and Coping Skills subdomains were little higher than the cluster II group in comparison to the cies discrepancies between the other subdomains. In the four domains, the means on the Daily Living Skills and Socialization were little higher than those on the Communication and Motor Skills for the MR group in comparisonto the cluster II profile.

Examining the profiles of the normal and MR groups, it was found the biggest gap between these two groups was Written performance, followed by Community, and Expressive subdomains; whereas the smallest gap between them was the Gross motor subdomain, followed by Receptive, Fine, Domestic, and Personal subdomains. For the normal subjects, the lowest performance was on the Gross subdomain, followed by Receptive subdomain and the highest performance was on the Written subdomain, followed by Community subdomain. As to the MR subjects, the lowest performance was on the Written subdomain, followed by Community subdomain and the highest performance was on the Gross subdomain, followed by Receptive subdomain.

The most deficit domain for the MR group was on the Communication, followed by Daily Living Skills, Socialization, and Motor skills which was totally different from the normal group

Table 4. Means and Standard Deviations of Raw Scores and Z Scores on the Two Cluster Solution of the Total Subjects and the Actual Performances of the Normal and MR Groups (N=799)

	Cluster I				Cluster II											
	High Function (n=572)				Low Function (n=227)				Normal Group (n=541)				MR Group (n=258)			
	Raw Score		Z Score		Raw Score		Z Score		Raw Score		Z Score		Raw Score		Z Score	
	Mean	SD	Mean	SD	Maen	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Subdomain																
Receptive	18.85	1.65	.35	.67	15.84	2.82	-.88	1.14	18.72	1.82	.30	.74	16.47	2.89	-.62	1.18
Expressive	52.87	6.37	.49	.53	32.33	10.11	-1.23	.84	52.19	7.68	.43	.64	36.21	12.22	-.90	1.02
Written	34.69	8.27	.49	.65	12.91	7.81	-1.22	.61	34.55	8.95	.47	.70	15.83	9.96	-.99	.78
Peraonal	68.70	4.06	.41	.48	56.38	10.38	-1.04	1.20	67.90	5.73	.32	.67	59.54	10.40	-.67	1.22
Domestic	26.11	9.72	.41	.84	9.45	5.77	-1.03	.50	25.09	10.82	.32	.94	13.58	8.86	-.67	.77
Community	68.77	4.06	.50	.54	36.49	13.94	-1.26	.76	67.65	12.24	.44	.67	42.74	17.74	-.92	.96
Interpersonal Relationship	29.10	4.90	.44	.69	18.15	5.60	-1.10	.79	28.54	5.67	.36	.80	20.64	6.83	-.75	.96
Play & Leisure	28.84	5.22	.45	.70	17.05	5.34	-1.13	.71	28.35	5.96	.38	.80	19.48	6.75	-.80	.90
Coping Skills	25.70	7.10	.46	.72	9.93	5.77	-1.15	.59	25.03	8.08	.39	.83	13.23	8.15	-.81	.83
Gross	30.70	2.50	.31	.54	25.66	6.40	-.78	1.39	30.45	2.97	.26	.64	26.79	6.19	-.54	1.34
Fine	25.06	2.14	.37	.56	20.15	4.70	-.92	1.24	24.87	2.26	.32	.60	21.14	4.96	-.66	1.31
Domain																
Communi-cation	106.07	13.85	.51	.55	61.07	13.36	-1.28	.69	105.46	16.59	.47	.66	68.50	22.02	-.99	.87
Daily Livihng	163.58	19.55	.50	.57	102.33	23.47	-1.27	.68	160.64	24.88	.42	.72	115.86	32.29	-.88	.94
Socialization	83.63	14.40	.49	.64	45.13	13.27	-1.23	.59	81.92	17.40	.41	.78	53.35	19.02	-.87	.85
Motor	55.76	3.83	.37	.49	45.81	10.16	-.92	1.31	55.32	4.62	.31	.60	47.93	10.21	-.65	1.32
Total	409.38	43.66	.53	.52	254.34	51.18	-1.33	.61	403.33	57.34	.45	.69	285.65	73.59	-.95	.88

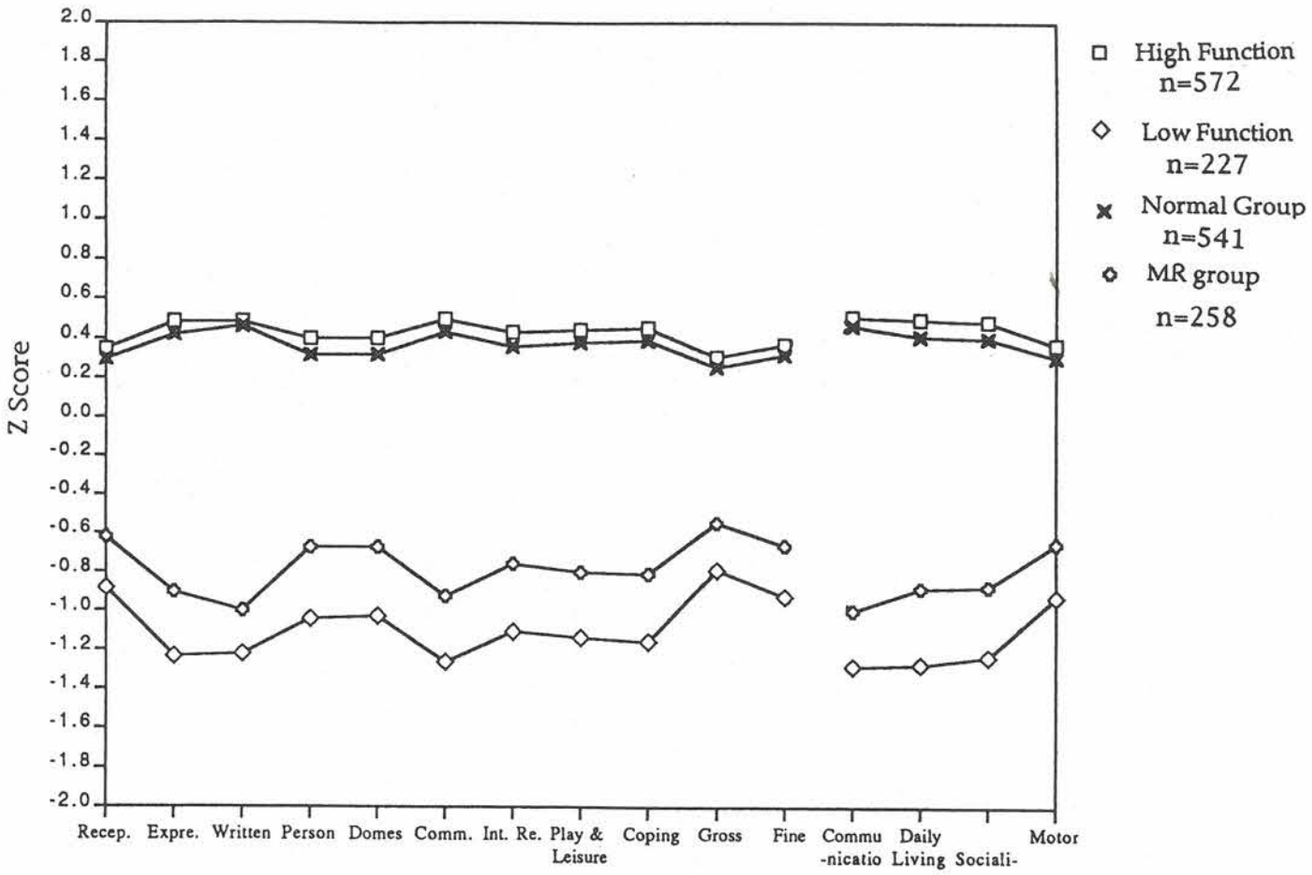

Figure 1 Profile Typologies of the Normal, MR, and Two Adaptive Behavior Function Groups of the Cluster Result for the Total Subjects

that the least deficit domain was on the Communication, followed by Daily Living Skills, Socialization and Motor Skills.

MR subjects

The same procedures were performed for MR subjects from grade 1 to grade 7 (N = 258). The result indicated a similar two-cluster solution existed by classifying functioning levels of adaptive behavior. Table 5 showed that the high functioning group contained 102 subjects whereas the low functioning group had 156 subjects. Compared to

Table 5. Number of Subjects in Two-Cluster Solution of VABS-CE for the MR Sample

	Cluster I	Cluster II	
	High function	Low function	Total
EMR	79	71	150
TMR	23	85	108
Total	102	156	258

were 108. It also was found 71 EMR subjects were in the low adaptive behavior functioning group, whereas 23 TMR subjects were in the high functioning group. This finding only showed that the adaptive behavior of the mildly retarded was a little better than that of the moderately retarded but, again, verified adaptive behavior is different from intelligence.

To examine the typologies, z scores with the same means and standard deviations of each subdomains, domains on VABS- CE (N=258) were used to draw the profile typologies of the two cluster groups and two mentally retarded groups. Table 6 indicates the means and standard deviations of the raw scores and z scores on VABS-CE for the four groups and Figure 2 shows these four profile typologies. In table 6, it was found that EMR group's means in all domains and subdomains were lower than the high adaptive behavior function group of the cluster result and that all means of the TMR group were higher than the low function group of the cluster result. Also, from Figure 2, the pattern of the EMR group was a little different from that of the high functioning group that its profile was smoother which indicated low scores existed commonly on all domains and subdomains. The lowest performance was found on the Domestic subdomain whereas the highest performance was on the Gross subdomain in comparison to the pattern of the high adaptive behavior function group from the cluster result. The pattern of the TMR group was similar to that of the low function group from the cluster result except that a little higher performances were found in the Personal and Domestic subdomain and that closer performances were found in the Community, Interpersonal Relationship, Gross, and Fine Motor subdomains and in the Motor Skills domain.

Examining the profiles of the TMR and EMR groups, it was found that the biggest gap between these two groups was the Community performance, followed by Interpersonal Relationship, and Play and Leisure Time subdomains; whereas the smallest gap between them was the Personal performance, followed by Receptive, Coping Skills, and Gross

Table 6. Means and Standard Deviations of the Raw Scores on the Two Cluster Solution of the MR Subjects and Actual Performances of the Two MR Groups (N=258)

	Cluster I (n=102)				Cluster II (n=156)				EMR Group (n=150)				TMR Group (n=108)			
	High Function				Low Function											
	Raw Score		Z Score		Raw Score		Z Score		Raw Score		Z Score		Raw Score		Z Score	
	Mean	SD	Mean	SD	Maen	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Subdomain																
Receptive	18.23	1.66	.61	.58	15.31	2.94	-.40	1.02	16.93	2.74	.16	.95	15.81	2.98	-.23	1.03
Expressive	46.03	7.94	.80	.65	29.78	10.07	-.53	.82	39.31	11.54	.25	.95	31.90	11.87	-.35	.97
Written	23.82	8.58	.80	.86	10.61	6.86	-.52	.69	18.26	10.21	.24	1.03	12.46	8.58	-.34	.86
Peraonal	67.08	3.66	.72	.35	54.62	10.44	-.47	1.00	61.16	10.25	.16	.99	57.30	10.25	-.22	.99
Domestic	20.73	7.96	.81	.90	8.91	5.79	-.53	.65	15.40	9.39	.21	1.06	11.06	7.40	-.28	.84
Community	58.92	9.63	.91	.54	32.15	13.27	-.60	.75	48.79	16.56	.34	.93	34.32	15.84	-.47	.89
Interpersonal Relationship	25.92	5.18	.77	.76	17.18	5.43	-.51	.79	22.52	6.53	.28	.96	18.02	6.40	-.38	.94
Play & Leisure	24.97	4.70	.81	.70	15.89	5.33	-.53	.79	21.21	6.60	.26	.98	17.07	6.23	-.36	.92
Coping Skills	18.75	7.58	.68	.93	9.63	6.29	-.44	.77	14.62	8.48	.17	1.04	11.31	7.27	-.24	.89
Gross	29.81	3.17	.49	.51	24.82	6.86	-.32	1.11	27.91	5.67	.18	.92	25.25	6.57	-.25	1.06
Fine	24.08	3.20	.59	.65	19.22	4.98	-.39	1.00	22.13	4.48	.20	.90	19.76	5.28	-.28	1.06
Domain																
Communi-cation	88.08	14.66	.89	.67	55.71	15.71	-.58	.71	74.50	21.17	.27	.96	60.18	20.49	-.38	.93
Daily Living	146.73	16.24	.96	.50	95.68	22.79	-.63	.71	125.35	31.49	.29	.98	102.68	28.66	-.41	.89
Socialization	69.64	13.31	.86	.70	42.70	13.99	-.56	.74	58.35	18.83	.26	.99	46.40	17.07	-.37	.90
Motor	55.89	5.00	.58	.49	44.04	10.86	-.38	1.06	50.04	9.46	.21	.93	45.01	10.53	-.29	1.03
Total	358.33	35.82	.99	.50	238.12	48.43	-.65	.66	308.25	70.74	.31	.96	254.26	65.79	-.43	.89

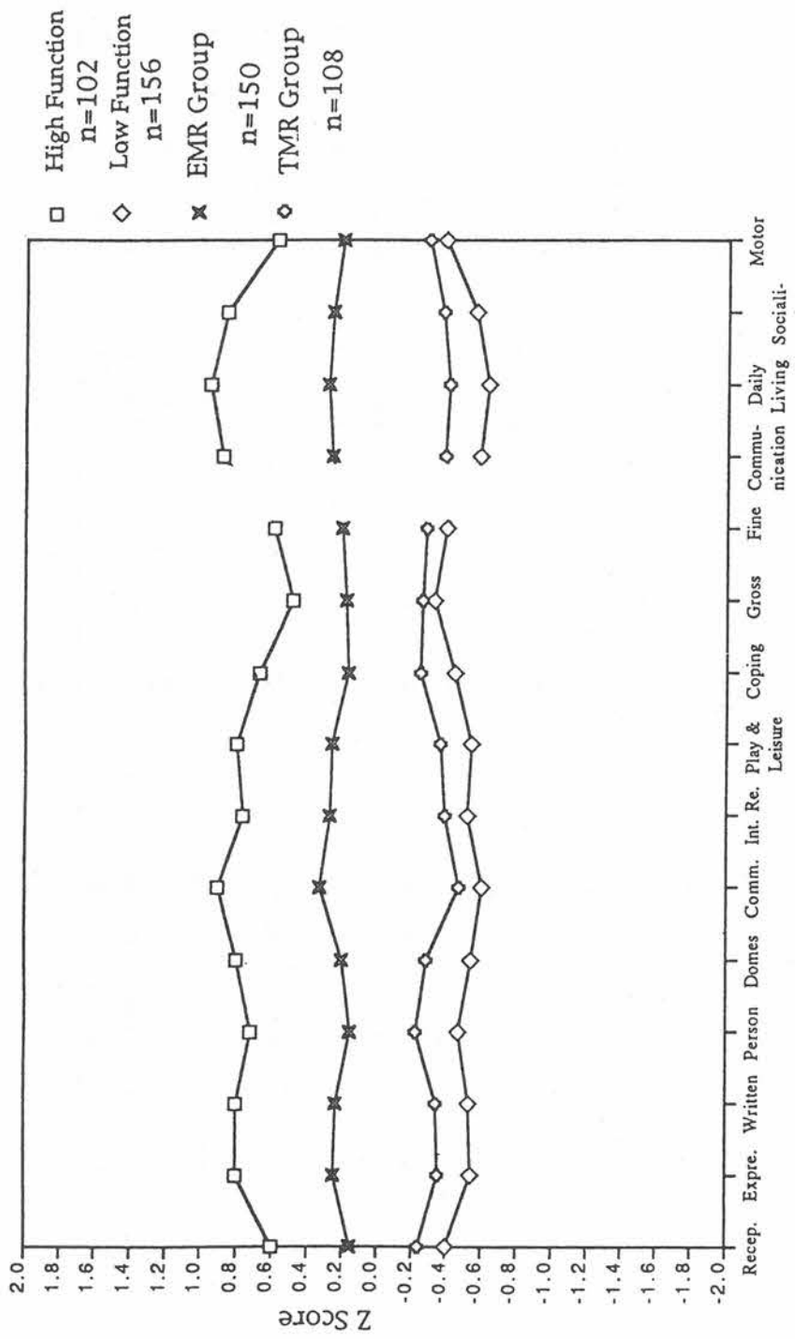

Figure 2 Profile Typologies of EMR, TMR, and Two Adaptive Behavior Function Groups of the Cluster Result for the Total MR Subjects

motor subdomains. In the four domains, the biggest gap was the Daily Living Skills, followed by Communication, Socialization, and Motor Skills. While examining the EMR profile alone, the lowest performance was both on the Receptive and Personal subdomains, whereas the highest performance was on the Community subdomain. In the four domains, pretty close performances were shown on the Communication, Daily Living, and Socialization Skills and little lower performance was shown on the Motor Skills domain. As to the profile of the TMR group, the lowest performance was on the Community subdomain, whereas the highest performance was on the Personal subdomain. Domains' means showed that the highest performance was on the Motor Skills, followed by Socialization and Communication, and the lowest performance was on the Daily Living Skills which were totally reversed to the performances of the EMR group.

Normal subjects and MR subjects

To compare the profile typology of the total mentally retarded group from grade 1 to grade 7 (N=258) with the core profile typologies of the normative group from grade 1 to grade 7 (N = 541), another cluster analysis using these normative sample was conducted. It was found a four- cluster solution could be represented to the norming sample. Table 7 shows the means and standard deviations of the raw scores and z scores on VABS- CE for these four groups and those of the MR group by using the same mean and standard deviation as the normative group (N = 541) on all VABS- CE scores and Figure 3 draws the core profile typologies of the normative sample and the actual profile typology of the MR sample.

The following briefly described the four core profile types of the adaptive behavior for the normative sample:

1. High adaptive behavior function group: Prevalence = 18%; Mean of the total scale = 469.48 (full raw score on VABS- CE is 484). This group's profile showed lower scores on the Receptive, Expressive, Personal, Gross, and Fine motor subdomains and on the Communication and Motor domains as compared to the scores on the other subdomains and domains.

2. Above average adaptive behavior function group: Prevalence = 54%; Mean of the total scale = 419.67. Except high performance on the Domestic subdomain, the profile of this group indicated more even scores distributed in all subdomains and domains. It also represented most children's adaptive behavior pattern.

3. Average adaptive behavior function group: Prevalence = 15%; Mean of the total scale = 358.49. This group's profile was quite different from the above two profiles in that higher performances were found on the Receptive, Personal, Gross, and Fine motor subdomains and on the Motor Skill domain.

4. Low adaptive behavior function group: Prevalence = 13%; Mean of the total scale = 295.13. The profile of this group indicated that higher performances were found on the Receptive, Domestic, Play and Leisure Time, Coping

Table 7. Means and Standard Deviations of the Raw Scores and Z Scores on the Four-Cluster Solution of the Normal Sample (N=541) and the Actual Performance of MR Group (N=258)

	Cluster I (n=97) High				Cluster II (n=292) Above Average				Cluster III (n=83) Average				Cluster IV (n=69) Low				MR Group (n=258)			
	Raw Score		Z Score		Raw Score		Z Score		Raw Score		Z Score		Raw Score		Z Score		Raw Score		Z Score	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
																			(N=541)	
Sub.																				
Rec.	19.82	.41	.60	.22	19.03	1.38	.17	.76	18.23	1.66	-.27	.91	16.45	2.64	-1.25	1.45	16.47	2.89	-1.24	1.59
Exp.	57.37	1.18	.67	.15	54.86	4.03	.35	.52	47.23	7.02	-.65	.91	39.61	8.83	-1.64	1.15	36.21	12.22	-2.08	1.59
Wri.	42.41	2.64	.88	.30	37.04	5.97	.28	.67	27.86	5.72	-.75	.64	20.99	8.83	-1.52	.99	15.83	9.96	-2.09	1.11
Per.	71.38	1.11	.61	.19	69.14	3.67	.22	.64	66.89	3.23	-.18	.56	58.97	9.08	-1.56	1.59	59.54	10.40	-1.46	1.82
Dom.	38.19	3.45	1.24	.32	26.22	7.99	1.04	.74	16.13	6.07	-.83	.56	12.28	8.32	-1.18	.77	13.58	8.86	-1.06	.82
Com.	80.45	3.24	1.05	.27	70.71	6.50	.25	.53	59.14	7.58	-.69	.62	46.93	11.25	-1.69	.92	42.74	17.74	-2.04	1.64
Inter.	33.70	2.37	.91	.42	30.12	3.27	.28	.58	24.49	4.67	-.71	.82	19.45	4.74	-1.60	.84	20.64	6.83	-1.39	1.20
P&L	34.68	1.84	1.06	.31	29.51	4.23	.19	.71	23.98	3.34	-.74	.56	19.83	5.15	-1.43	.87	19.48	6.75	-1.49	1.13
Cop.	33.62	2.48	1.06	.31	26.39	5.48	.17	.68	19.65	6.33	-.66	.78	13.62	7.28	-1.41	.90	13.23	8.15	-1.46	1.01
Gross	31.67	.83	.41	.28	31.07	1.54	.21	.52	30.36	2.27	-.03	.76	26.22	5.55	-1.43	1.87	26.79	6.19	-1.23	2.08
Fine	25.88	.56	.45	.25	25.59	.94	.32	.41	24.53	1.64	-.15	.73	20.80	3.55	-1.80	1.57	21.14	4.96	-1.65	2.19
Dom.																				
Com.	119.61	3.08	.85	.19	110.93	8.53	.33	.51	93.31	11.16	-.73	.67	77.04	17.19	-1.71	1.04	68.50	22.02	-2.23	1.33
Daily	190.33	5.81	1.19	.23	166.06	12.43	.22	.50	102.17	10.93	-.74	.44	118.17	20.79	-1.71	.81	115.86	32.29	-1.80	1.30
Soc.	102.00	4.33	1.15	.25	86.02	9.16	.24	.53	68.12	8.70	-.79	.50	52.90	13.90	-1.67	.80	53.35	19.02	-1.64	1.09
Motor	57.55	1.06	.48	.23	56.66	1.94	.29	.42	54.89	2.88	-.09	.62	47.01	7.52	-1.80	1.63	47.93	10.21	-1.60	2.21
Total	469.48	9.32	1.15	.16	419.67	20.82	.28	.36	358.49	18.62	-.78	.32	295.13	44.62	-1.89	.78	285.65	73.59	-.95	.88

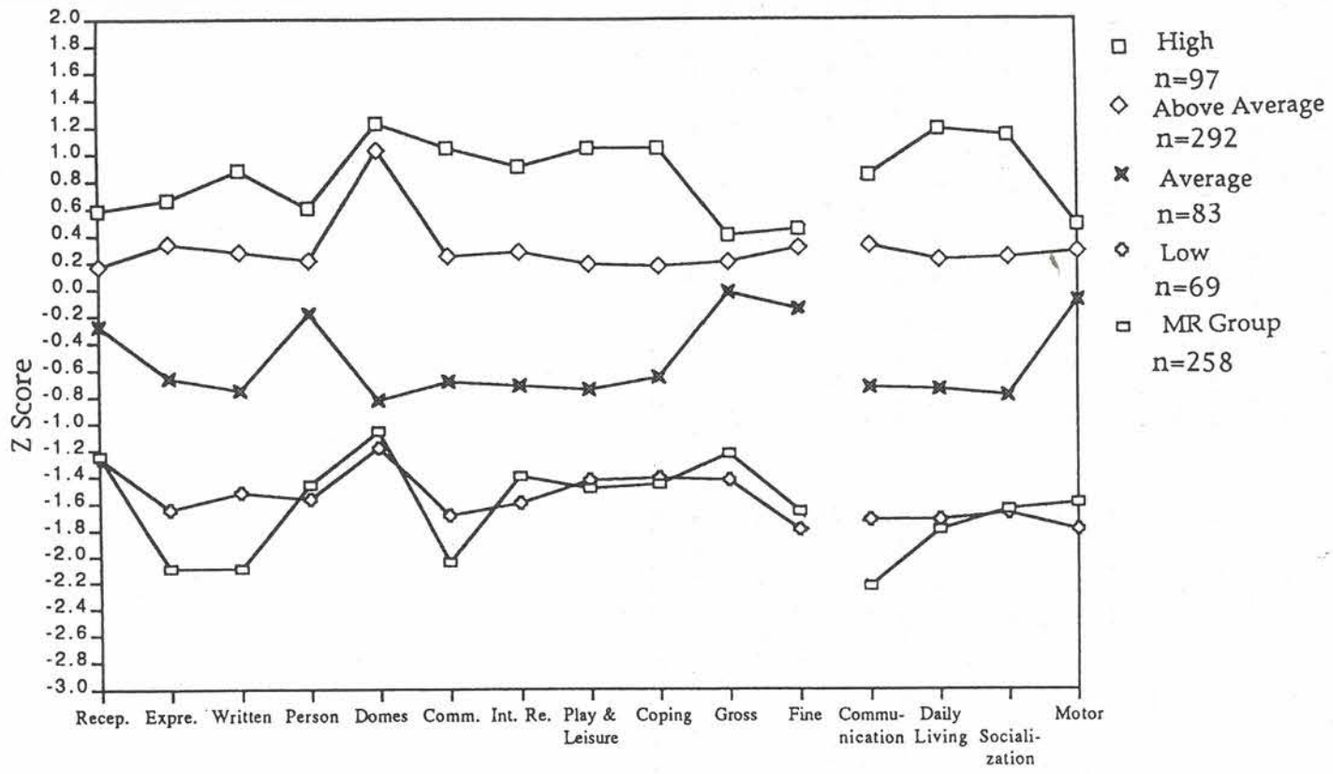

Figure 3 Core Profile Typologies of Four-Cluster Solution for the Norm Sample and the Actual Profile Typology of the MR Group

Skills, and Gross motor subdomains. The domains differences were not shown obviously in this type.

As to the profile of the actual performances on VABS-CE for the MR subjects, a quite unique typology was found in comparison to the four core profile types. In general, the performances of the MR group (Mean of the total scale = 285.65) was closer but lower than those of the low adaptive behavior function group. However, the performances on the Personal, Domestic, Interpersonal Relationship, Gross, and Fine subdomains and the motor domain were a little higher than those of the low function group of the core profile types. Almost the same performances on the Receptive subdomain and Socialization domain and similar performances on the Play and Leisure Time and Coping Skills subdomain and Daily Living domain were found between these two profiles.

While examining the profile of the MR group alone, it was found that the most deficit was in the Written, followed by Expressive, and Community subdomains and in the Communication domain; whereas the least deficit was in the Domestic, followed by Gross and Receptive subdomains and in the Motor domain.

From the profile typologies the differences of adaptive behavior patterns were shown between the normal groups and the MR group, the EMR and TMR groups, and the low adaptive behavior function group of the core profile types and the MR group. To check if the differences were statistically significant, three t-tests for independent groups were performed. The results were as followed:

Normal and MR groups

Table 8 indicates that the t values of all domains, subdomains, and total scale of VABS- CE reached statistically significant level ($p < .001$) between the normal and MR groups.

Table 8. Means, Standard Deviations, and *t*-Test for the Normal and MR Subjects

	Normal Group (N=541)		MR Group (N=258)		
	Mean	SD	Mean	SD	*t* value
Subdomain					
Receptive	18.72	1.82	16.47	2.89	11.51***
Expressive	52.19	7.68	36.21	12.22	19.28***
Written	34.55	8.95	15.83	9.96	25.64***
Personal	67.90	5.73	59.54	10.40	12.06***
Domestick	25.09	10.82	13.58	8.86	15.95***
Community	67.65	12.24	42.74	17.74	20.37***
Interpership	28.54	5.67	20.64	6.83	16.13***
Relationship					
Play & Leisure	28.35	5.96	19.48	6.75	18.03***
Coping Skills	25.03	8.08	13.23	8.15	19.18***
Gross	30.45	2.97	26.79	6.19	9.00***
Fine	24.87	2.26	21.14	4.96	11.51***
Domain					
Communication	105.46	16.59	68.50	22.02	23.92***
Daily Living	160.64	24.88	115.86	32.29	19.67***
Socialization	81.92	17.40	53.35	19.02	20.40***
Motor	55.32	4.62	47.93	10.21	11.09***
Total Scale	403.33	57.34	285.65	73.59	22.62***

***$p < .001$.

EMR and TMR groups

Table 9 shows all mean scores of domains, subdomains, and total scale of VABS-CE in the EMR group were significantly higher than those in the TMR group ($p < .01$).

Table 9. Means, Standard Deviations, and *t*-Tast for the EMR and TMR Subjects

	EMR Group (N=150)		TMR Group (N=108)		*t* value
	Mean	SD	Mean	SD	
Subdomain					
Receptive	16.93	2.74	15.81	2.98	3.08**
Expressive	39.31	11.54	31.90	11.87	5.00***
Written	18.26	10.21	12.46	8.58	4.94***
Personal	61.16	10.25	57.30	10.25	2.99**
Domestick	15.40	9.39	11.06	7.40	4.15***
Community	48.79	16.56	34.32	15.84	7.10***
Interpersonal Relationship	22.52	6.53	18.02	6.40	5.53***
Play & Leisure	21.21	6.60	17.07	6.23	5.13***
Coping Skills	14.62	8.48	11.31	7.27	3.37***
Gross	27.91	5.67	25.25	6.57	3.39***
Fine	22.13	4.48	19.76	5.28	3.79***
Domain					
Communication	74.50	21.17	60.18	20.49	5.49***
Daily Living	125.35	31.49	102.68	28.66	6.02***
Socialization	58.35	18.83	46.40	17.07	5.31***
Motor	50.04	9.46	45.01	10.53	3.95***
Total Scale	308.25	70.74	254.26	65.79	6.30***

**$p < .001$. ***$p < .001$.

Low adaptive behavior function group of the core profiles and MR group

Table 10 shows that the mean scores of the Written and Expressive subdomains and the Communication domain in the low adaptive behavior function group were significantly higher than those in the MR group ($p < .05$). No differences were shown in other subdomains, domains, and total scale of VABS-CE between these two groups.

Table 10 Means, Standard Deviations, and *t*-Test for the Low Adaptive Function Group of the Core Profiles and the MR Group

	Low Adaptive Function Group (N=69)		MR Group (n=258)		*t* value
	Mean	SD	Mean	SD	
Subdomain					
Receptive	16.45	2.64	16.47	2.89	-.052
Expressive	39.61	8.83	36.21	12.22	2.166*
Written	20.99	8.83	15.83	9.96	3.741***
Personal	58.97	9.08	59.54	10.40	-.415
Domestic	12.28	8.32	13.58	8.86	-1.096
Community	46.93	11.25	42.74	17.74	1.863
Interpersonal Relationship	19.45	4.74	20.64	6.83	-1.361
Play & Leisure	19.83	5.15	19.48	6.75	.401
Coping Skills	13.62	7.28	13.23	8.15	.361
Gross	26.22	5.55	26.79	6.19	-.694
Fine	20.80	3.55	21.14	4.96	-.534
Domain					
Communication	77.04	17.19	68.50	22.02	2.986***
Daily Living	118.17	20.79	115.86	32.29	.563
Socialization	52.90	13.90	53.35	19.02	-.184
Motor	47.01	7.52	47.93	10.21	.699
Total Scale	295.13	44.62	285.65	73.59	1.020

*$p < .05$. **$p < .01$. ***$p < .001$

IQ and Adaptive Behavior

Table 11 shows the correlation coefficients and the regression analysis of IQ and all variables in VABS- CE for total MR subjects from grade 1 to grade 9 (N =368). The correlation coefficients between IQ and all subdomains, domains, and total scale ranged from .29 to .51 and all reached significant level ($p<.01$). Correlation coefficients of 4 domains ranged from .45 to .37. In the subdomains, the results indicated the correlation coefficients exceeding .40 were the Community, Expressive, Play and Leisure Time, and Written variables. The correlation coefficient between IQ and total scale score of VABS- CE was .49. In the subdomains, IQ could predict 26 % of Community subdomain score but only could predict 8% of the Personal subdomain's score. Of the 4 domains, IQ could predict about 20% of the Communication and Daily Living performances, 18 % of the Socialization performance, and 13% of the Motor performance.

Although the above results indicated low to moderate relationships existed between IQ and all VABS- CE scores, they did not show the distribution of the adaptive behavior performances on the MR subjects presently identified mainly by IQ test. Therefore, Table 12 showed the number of MR subjects whose performances on VABS-CE subdomains and domains were below the 25th percentile. The findings indicated that most of the MR subjects (301 of the 368) have Written deficiency, followed by Expressive (276), Community (268),and Coping Skills (253) in the subdomains. Also, it was shown that the least deficient subdomains for these MR subjects were Receptive (171) and Gross (171). In the four domains, Communication is the most deficit one, followed by Socialization, Daily Living, and Motor Skills.

Table 11. Summary of Correlation Coefficients and Regression Analysis of IQ and All Variables of VABS-CE for the Total MR Subjects (N=368)

	r	R^2	Adjusted R^2	B	Beta	F
Subdomain						
Rceptive	.291***	.085	.082	.708	.291	33.903***
Expressive	.431***	.186	.183	.465	.431	83.450***
Written	.401***	.161	.158	.376	.401	70.112***
Personal	.290***	.084	.082	.261	.290	33.664***
Domestic	.317***	.100	.098	.296	.317	40.879***
Community	.510***	.260	.258	.850	.510	128.765***
Interpersonal Relationship	.389***	.151	.149	.246	.389	65.283***
Play & Leisure	.402***	.162	.159	.257	.402	70.635***
Coping Skills	.345***	.119	.117	.264	.345	49.541***
Gross	.314***	.098	.096	.164	.314	40.117***
Fine	.365***	.133	.131	.153	.365	56.372***
Domain						
Communication	.453***	.205	.203	.911	.453	94.375***
Daily Living	.454***	.206	.204	1.407	.454	94.772***
Socialization	.430***	.184	.182	.767	.430	82.788***
Motor	.367***	.135	.133	.317	.367	57.064***
Total Scale	.490***	.240	.238	3.401	.490	115.386***

*** $p<.001$.

For the EMR subjects, similar findings were shown as described for all MR subjects except that Gross (83) and Fine (113) deficiencies occurred less frequently than Receptive (84) and Play and Leisure Time (115) deficiencies.

For the TMR subjects, somewhat different results were shown in the subdomains that Community deficiency (130) was more frequent than he Expressive deficiency (126) and that Fine motor deficiency (114) was more frequently occurred than the Interpersonal Relationship deficiency (112). Also, in the domains, Daily Living deficiency (127) was slightly more frequent than the Socialization deficiency (124).

Table 12. Number of MR Subjects with Scores below the 25th Percentile on VABS-CE Scale

	EMR (n=223)	TMR (n=145)	Total (n=368)
Subdomains			
Receptive	84	87	171
Expressive	150	126	276
Written	169	132	301
Personal	110	103	213
Domeestic	98	102	200
Community	138	130	268
Interpersonal Relationship	119	112	231
Play & Leisure	115	110	225
Copong Skills	135	118	253
Gross	83	88	171
Fine	113	114	227
Domains			
Communication	170	135	305
Daily Living	126	127	253
Socialzation	135	124	259
Motor	109	107	216
Total	153	135	288

However, it was still unclear how many subjects had adaptive behavior deficiencies as the criterion listed in the Special Education Law of the Republic of China that the student's score on the adaptive behavior scale is below 25th percentile in any one of the subdomains. Thus, another contingency table (see Table 13) was performed to examine the number of subjects who are qualified or misidentified as mental retardation when adaptive behavior deficit in any one subdomain is added as the criterion besides intelligence. The result indicated 28 subjects had no adaptive behavior deficiency if using VABS-CE as the measure. In these 28 subjects, 27's IQs fell in the EMR range (2SD to 3SD below the mean) and 20's IQs were in the range of 65 to 69. Only one TMR subject with IQ of 54 (nearly EMR range) had no adaptive behavior deficiency.

From Table 13, it was found 92% of the mentally retarded had a deficiencyin at least one subdomain on VABS-CE. However, it is interesting to know the ratio and number of normal subjects who also had a deficiency in at least one subdomain on VABS- CE in comparison to those of the mentally retarded. Table 14 lists the number of normal subjects from grade 1 to grade 7 and mentally retarded subjects from grade 1 to grade 9 who had or had not adaptive behavior deficiency in at least one subdomain on VABS- CE at elementary and junior high levels.

Table 14 showed that 58% (313 of the 514) of the normal subjects also had a deficiency in at least one subdomain on VABS- CE. This finding,

Table 13. Sampling Distirbution of Adaptive Behavior on VABS-CE for the Total MR subjects

Adaptive Behavior Deficiency in any one subdomain	EMR	TMR	Total
Yes	196	144	340
No	27	1	28
Total	223	145	368

Table 14. Sampling Distribution of Adaptive Behavior on VABS-CE for the Normal MR and Subjects

Adaptive Behavior Deficiency in any ane subdomain	Normal Group			MR Group		
	Elementary	Junior High (grade 7)	Total	Elementary	Junior High (grade 7 to 9)	Total
Yes	272	41	313	196	144	340
No	158	70	228	2	26	28
Total	430	111	541	198	170	368

again, verified adaptive behavior is different from intelligence. The result also indicated that adaptive deficiencies were more frequently shown in the elementary levels for both normal (272) and mentally retarded (196) subjects.

DISCUSSION

Structure and Pattern of Adaptive Behavior

The four factor analysis results showed approximately 66% to 67% of the total variance could be explained by the two-factor solution across the four samples. Factor I approximately explained 40% to 44% of the total variance and Factor II approximately explained 22% to 27% of the total variance. However, as described by Tinsley and Tinsley (1987), less than 50% of the total variance explained by a factor solution has appeared frequently in factor analyses.

Factor analysis indicated a similar two-factor solution of adaptive behavior across the four samples. Factor I seemed very similar to the factor" Functional Autonomy" as identified by Meyers et. al. (1979) or " Cognition" as identified by Song et al. (1980). It emerged in all IQ groups and was defined primarily by subdomains labeled Expressive, Written, Domestic, Community, Interpersonal Relationships, Play and Leisure Time, and Coping Skills. Factor II could be labeled as " Personal Self-Sufficiency" as identified by Nihira (1976) or " Psychomotor" as identified by Song et al. (1980). It was defined primarily by variables labeled Personal, Gross, and Fine subdomains. This result was quite similar to Nihira's finding (1976) because the Personal subdomain contains the eating, dressing, and personal hygiene skills as found by Nihira in AAMD- ABS, Public School Revision. However, since the two factors' loadings on Personal subdomain were pretty close to each other across the four samples, Factor II seemed most suitable to be labeled as " Psychomotor" as found by Song et al. Also, this result might be caused because the personal daily living skills such as eating, dressing, and personal hygiene need to utilize both the " Cognition' and" Psychomotor" dimensions.

Among all factor analysis results, it was found that less amount loading of variance across the four samples was on the Receptive subdomain. In this variable, the factor result of the normal and EMR groups seemed much closer to each other that the factor loading is more on the factor II but not the factor I; whereas the total MR group and the TMR group seemed more consistent with the construct of the VABS-CE that Receptive, Expressive, and Written subdomains were attributed to the Communication domain which loaded heavily on factor I " Cognition" . As mentioned earlier, however, the communalties of both factors in Receptive subdomain were pretty low, especially for the normal and EMR groups, in comparison to the communalties of the other subdomains. Also, this finding might be caused by too few items (n = 10) in the Receptive subdomain.

In summary, the findings of factor analyses were consistent with Meyer et al's conclusion (1979) that adaptive

behavior is a two- dimensional construct. Also, the results verified Bruininks et al's claim that adaptive behavior factor analytic research does not appear to show any difference in the structure of adaptive behavior as a function of degree of mental retardation or presence or absence of mental retardation. This result also coped with the researcher's expectation.

In classification system, cluster analysis results found a two-cluster solution with high and low adaptive behavior function levels across two samples: total subjects including normative and mentally retarded subjects from grade 1 to grade 7 (N=799) and total mentally retarded subjects from grade 1 to grade 7 (N=258). In general, these two classification analyses indicated VABS-CE could identify both the normal and mentally retarded subjects and the mildly and moderately retarded students as well. The results showed that VABS-CE seems to have good construct validity even though these mentally retarded students are mainly classified by individual intelligence test. It also looked like that VABS- CE seems more suitable for classification of the moderately retarded who are presently labeled only by intelligence criterion. However, since adaptive behavior is different from intelligence, mildly retarded students may have lower adaptive behavior function level than the moderately retarded. It could not be concluded that VABS-CE is less suitable for classifying mildly retarded students. Nevertheless, the above two cluster analysis findings verified that adaptive behavior is needed as a criterion in the classification of mental retardation because some students might not be mentally retarded if using both intelligence and adaptive behavior criteria.

In comparison to the profile typologies among the normal, MR, and the two adaptive behavior function groups of the cluster result, it was found that the patterns were pretty similar between the normal sample and high adaptive behavior function group and the MR subjects and low adaptive behavior function group as well. However, taking a better look on both the profiles and the mean scores, it seemed that MR group's adaptive behavior was higher than the low functioning group of the cluster solution, especially in the Personal and Domestic subdomains and in the Daily Living and Socialization domains. Also, pretty consistent and close performances on the Receptive, Written, Gross, and Fine motor subdomains as well as on the Communication and Motor domains were found between these two groups. The performances on all VABS-CE scores of the normal group, although a little bit lower, were pretty similar to those of the high adaptive behavior function group. The profile typologies of the four groups contended that MR had bigger deficits in the Written, Expressive, and Community subdomains and in the Communication domain but smaller deficits in the Domestic, Personal, Gross, and Fine motor subdomains and in the Motor domain. This finding was consistent with the researcher's expectations.

Also, the above findings indicated that the MR group's adaptive behavior was closer to the norm sample as compared to the cluster result, however, while examining the differences through t-test for independent groups, the result indicated that all performances on VAB S-CE of the MR group were significantly lower than those of the normal group. This finding was consistent with previous research results (Childers & Bolen,1985; Harrison & Ingram, 1984; Rainwater-Bryant, 1985; Ronka, 1984) that normal children have higher scores on adaptive behavior.

The profiles of the two clusters for the total MR subjects from grade 1 to grade 7 and the actual performances on VABS-CE for the two MR groups in the same grade range showed that EMR group's means in all domains and subdomains were lower than the high adaptive behavior function group of the cluster result and that all means of TMR group were higher than those of the low function group of the cluster result. The pattern of the EMR group was a little different from that of the high functioning group in that its profile was smoother which indicated that low scores existed commonly on all domains and subdomains. The lowest performance was found on the Personal subdomain whereas the highest performance was on the Community subdomain in this group. The pattern of the TMR group was similar to that of the low function group of the cluster result except that a little higher performances were found on the Personal and Domestic subdomain and that closer performances were found on the Community, Interpersonal Relationship, Gross, and Fine Motor subdomain and on the Motor Skills domain. For the EMR group, smaller discrepancies were found in the Gross and Fine motor subdomains, and in the Motor Skills domain in comparison to the high function group of the cluster result.

The above results seemed to suggest that the adaptive behaviors of the EMR and TMR subjects were much closer than those of the two cluster groups. However, while performing the t - test for independent groups, the result indicated that all means of the EMR group were significantly higher than those of the TMR group. This result was consistent with Harrison et al. finding (1990) and it also indicated that intelligence has some influence on adaptive behavior.

The four-cluster solution of the norm sample from grade 1 to grade 7 roughly represented the core profile types: high, above average, average, and low adaptive behavior. Because this study's main purpose was to investigate the adaptive behavior of the mentally retarded, no advanced or different cluster analysis was performed to test the stability and replicability of the core profile typologies.

Future studies are needed to find out the most representative core profile typologies of the total norm group by using the standard scores from the norm and to meet the cluster goals as mentioned in Glutting and McDermott's study (1990). For this study, the researcher emphasized only on the comparison of the actual MR group's profile with the core profiles. The result showed that

the pattern of the MR group was quite unique in comparison to the four core profiles of the norm sample. This finding was consistent with the researcher's expectation. Also, it was found that the largest deficit of the MR subjects was on the Written subdomain, followed by Expressive and Community subdomains, whereas the least deficit was on the Interpersonal Relationship, followed by Gross, Fine, and Domestic subdomains, in comparison to the profile of the low adaptive behavior function group. In the domains, the largest deficit was in Communication whereas the least deficit was on the Motor domain and almost the same performances were found on the Socialization and Daily Living domains between the two profiles. However, close performances were shown between the two groups. While performing the t - test, the result indicated that the scores on the Written and Expressive subdomain and on the Communication domain of the mentally retarded group were significantly lower than those of the low adaptive behavior function group.

The above findings, although similar, were somewhat different from the researcher's expectations that the primary deficit domains are Communication and Socialization and the most deficit is anticipated in Written, followed by Expressive, Community, and Interpersonal Relationships. The small differences on the Socialization domain and Interpersonal Relationships subdomain between these two groups might be caused by the current curricula that the content and instructional design for the normal children focus primarily on the knowledge and facts in the major academic areas, which neglect their applications to the actual life; whereas the content and instructional design for the MR children place more emphasis on the social skill training. This comment could be seen and proved by the core profiles that all four normal groups showed lower scores on Interpersonal Relationship, as compared to other subdomains.

While examining the profile of MR group alone, it was found that the most deficit was in the Written, followed by Expressive and Community subdomains, and in the Communication domain whereas the least deficit was in the Domestic, followed by Gross and Receptive subdomains, and in the Motor domain. Also, more even performances on the three subdomains (Interpersonal Relationships, Play and Leisure Time, and Coping Skills) of the Socialization domain were found within this group. This progress could be attributed to the success of program planning and teaching, which focus more on the social skill and perceptual-motor training, of the special classes for the mentally retarded in Taiwan.

IQ and Adaptive Behavior

Two t - test results on all VABS-CE scores between the normal and mentally retarded groups as well as between the mildly and moderately retarded groups indicated that intelligence has some influence on the adaptive behavior. It seemed that the higher the intelligence, the better the adaptive behavior. The cluster results also showed that normal children's adaptive behavior was higher than the mentally retarded and that mildly retarded students' adaptive behavior was higher than the moderately retarded. From Pearson correlation and regression analysis results, although statistically significant level were shown, the correlation coefficients between IQ and all VABS- CE scores only implied positive but low to moderate relationships (from .29 to .51). The regression analysis also showed only 8% to 26% adaptive behavior performances of the mentally retarded could be predicted by intelligence. These findings were consistent with the t - test results that higher intelligence might cause higher adaptive behavior. Also, it agreed to many research findings (Childs, 1982; Fine et al., 1990; Harrison et al., 1990; Heath, 1984; Nihira et al., 1974; Sheu, 1985) that a low to moderate positive relationship exists between IQ and adaptive behavior and that higher intelligence causes higher adaptive behavior.

As stated earlier, one main purpose of this study was to find out the difference between intelligence and adaptive behavior to examine if it is needed to add adaptive behavior as another criterion in classifying the mentally retarded students. Although the cluster results and Pearson correlation findings verified that adaptive behavior and intelligence are two separate but related constructs, another question is, how many mentally retarded students, currently identified mainly by the individual intelligence test, should not be placed in the mentally retarded class if using the criteria stated in the Special Education Law and its Regulations of the Republic of China? Table 13 showed that, indeed, approximately 8% of the mentally retarded students (28 of 368) had higher adaptive behavior who were misidentified as mentally retarded if using both intelligence and adaptive behavior criteria as stated in the Special Education Law of ROC.

In fact, the criterion of adaptive behavior of the law is so loose that any one whose adaptive behavior was below the 25th percentile rank on any social adaptive behavior subscale is classified as having an adaptive behavior deficit. This claim could be proved by the result in that 58% of the normal subjects in this study had an adaptive behavior deficiency (see Table 14). Even under this liberal restriction, however, 28 (8%) of the mentally retarded subjects are still misplaced and mislabeled currently. This strongly suggests that, if we want to keep the law, an adaptive behavior measure is needed during the identification and placement procedures.

Also, it was found that the Written, Expressive, Community, and Coping Skills were the most commonly appearing deficits of mentally retarded students, whether at mild or moderate levels. Other common deficits were Interpersonal Relationship, Play and Leisure Time, and Fine Motor Skills. The least common deficit was Gross, followed by Receptive subdomain. In the domains, the most deficit was Communication, followed by Socialization, Daily Living Skills, and Motor Skills. This more advanced and thorough analysis indicated similar but more accurate results as found in the cluster analyses and profile typologies and were pretty close to the researcher's expectations.

CONCLUSIONS AND RECOMMENDATIONS

The following briefly described the major findings, limitations, and suggestions of this study.

The major findings in this study were as follows :

1. Adaptive behavior is a two-dimensional construct for both the normal and mentally retarded students. Cognition and Psychomotor adequately named the two main factors.

2. Basically, VABS-CE is suitable to use for classification of mental retardation. The cluster results and profile typologies showed that it can generally discriminate normal and mentally retarded children.

3. The pattern of adaptive behavior of the mentally retarded is unique. Generally, the profile typology of the mentally retarded is different from the core profile typologies of the normal children. However, except the lower performances on Written and Expressive subdomains and the Communication domain, mentally retarded group's adaptive behaviors on other VABS- CE scales were similar to those of the low adaptive behavior function group of the core profile types. Both the cluster result and contingency table indicated that the most deficit subdomain of the mentally retarded is Written, followed by Expressive and Community and the most deficit domain is Communication.

4. All adaptive behavior performances on subdomains, domains, and total VABS-CE scale of the mentally retarded were lower than those of the normal students whereas all adaptive behavior performances of the mildly retarded were higher than those of the moderately retarded ($p < .001$).

5. Low to moderate relationships (r ranged from .29 to .51) were found between intelligence and all domains, subdomains, and total scale scores on the VABS-CE. Only 8% to 26% of the adaptive behavior could be predicted from intelligence.

6. 28 students (8%) were misidentified as mentally retarded by adding adaptive behavior as another criterion besides intelligence. Both the cluster results and contingency tables showed that an adaptive behavior measure is needed during the identification procedure of mental retardation.

Because norms tables have not been established yet, raw scores were used in this study. As described by Glutting and McDermott (1990), raw scores are disadvantageous because (a) their means and standard deviations are incompatible across subtests and scales, and (b) they vary as a function of children's ages. Although the researcher used z scores to replace the raw scores in the profile typology analysis, the use of raw scores still limits the generalizability of the findings in this study. Establishing various norms for VABS-CE are needed in the near future.

Since the main purpose of this study was to explore the adaptive behavior of the mentally retarded, the researcher only used the core profiles of the normative sample as a comparison to the profile of the mentally retarded. The core profile typology analysis was more restricted than the core profile typology analyses in WAIS-R Scale (McDermott, Glutting, Jones, & Noonan, 1989), WISC- R Scale (McDermott, Glutting, Jones, Watkins, & Kush, 1990), WPPSI Scale (Glutting & McDermott, 1989), and McCarthy Scales of Children's Abilities (Glutting & McDermott, 1990). The above core profiles were described according to score configurations and by members' age, gender, race, parental education, and family occupation levels. In this study, however, the core profile types were only analyzed based on the score configurations of the normative sample from grade 1 to grade 7. Also, typological stability and replicability analyses were not conducted in this study.

Therefore, the core profile typologies found in this study should be replicated in the future. As concluded by Dillon and Goldstein (1984), cluster analysis, like principal components analysis, is frequently the first step in an analysis. Consequently, it should naturally lead to a further investigation of the data and not simply to casual acceptance of the clusters obtained.

In this study, the characteristics and deficits in adaptive behaviors of the mildly and moderately retarded were identified. However, the extrinsic environment features may also influence and interact with the adaptive behaviors of the mentally retarded. For instances, social economic status, school location (urban or rural), school facilities, teacher's attitudes may influence the adaptive behaviors of the mentally retarded. Therefore, implications of the findings in this study should be considered cautiously. Future studies should examine the relationships between extrinsic environment features and adaptive behaviors for enhancing appropriate adaptive behaviors of the mentally retarded by matching their deficits with adequate learning environment.

Coulter (1980) stated that adaptive behavior scales are typically used for two primary purposes: (a) to obtain data for the identification of handicaps and placement of children in special education programs; (b) to gain information for planning educational and treatment programs for children in order to include social and self-help skills as part of intervention. Following are some suggestions for educational implications.

Identification and Placement

The findings in this study clearly showed that adaptive behavior is related to but different from intelligence. The actual number of misidentified students in current special classrooms may be more frequent than those that were found in this study. Therefore, if we want to keep the Special Education Law and its Regulations of ROC, an adaptive behavior measure is needed during future identification procedures for the mentally retarded. For matching this need, more adaptive behavior scales have to be edited and revised in the near future for different subjects and purposes. For instance, norms for the VABS- CE need to be established urgently and the other two forms of the Vineland Adaptive Behavior Scales (Survey Form and Expanded Form) also need to be revised as soon as possible.

However, as argued by Reschly (1986b), there is no clear concensus on what constitutes a deficit in adaptive behavior. In the United States, most states give specific intelligence test scores for classifying mental retardation, but usually no cut off scores for adaptive behavior scales. This may cause an issue of declassification which occurs when children with subaverage intellectual functioning are no longer eligible for a mental retardation classification because of adequate adaptive behavior (Destefano & Thompson, 1990). Although the adaptive behavior deficit criterion used in the Special Education Law and its Regulations is fairly loose, a serious issue of declassification may not arise in Taiwan. Current identification procedures focusing mainly on the intellectual functioning may even cause an over-classification issue. In the future, however, if an adaptive behavior measure should be included as stated in the Regulations of Special Education Law of ROC, Reschly's (1985) suggestion to set up two levels of mentally retarded programs can be considered. He suggested that, we define educational retardation as these who only have subaverage intellectual function and school achievement and define mental retardation as those who have both intellectual and adaptive behavior functioning deficiencies. This application not only can prevent some children from receiving the negative label of mental retardation but also can provide them with special education services based on their needs.

Intervention Planing

One purpose of this study was to identify the adaptive behavior deficits of the mentally retarded and, according to the findings, to provide more suitable learning environments and intervention programs for them in order to remediate those deficits. For instance, the profile of scores on the domains and subdomains of VABS- CE illustrated the strengths and weaknesses which can be used to select areas that need to be addressed in an intervention program. Based on the findings of this study, the following are some educational implications:

1. Written, Expressive, and Community are found to be the main weaknesses on adaptive behavior of the mentally retarded, therefore, future curriculum and instructional designs should place more emphases on these areas. For instance, oral speech training should be emphasized, and important common words should be learned, recognized, and written through teaching. In addition, independent living skills should be integrated into the curriculum.

2. Learning environments should be adjusted to meet the needs of the mentally retarded. Community resources such as the post office, restaurants, supermarkets, banks, and other needed facilities in our community should be utilized for instruction on daily living and socialization skills. Classrooms could be redecorated with various learning centers (i.e., small library, language center, motor training and playing center) to provide suitable environments to address different deficits. Also, seats could be rearranged to provide the students with interpersonal relationships deficits with sitting next to those with good interpersonal relationships to facilitate the improvement in interpersonal skills.

3. A criterion-referenced assessment and curriculum for adaptive behavior skills can be edited and revised to connect normed tests (i.e., AAMD- ABS, VABS- CE) and instruction closer together. For instance, the newly published Checklist of Adaptive Living Skills (Morreau, Bruininks, 1991) and Adaptive Living Skills Curriculum (Bruininks, Morreau, Gilman, & Anderson, 1991) can be referenced and revised by the educators in Taiwan, ROC.

Currently, adaptive behavior is still a new research field in Taiwan, ROC, which needs much research to explore and verify. The findings in this study provides a good start and precious value to explore the adaptive behavior of the mentally retarded in Taiwan, ROC. It is important to recognize that the nature of individual difference in adaptive behavior varies considerably over different ages and levels of retardation. In the present study it has been demonstrated that adaptive behavior can be described in terms of two dimensions across three intelligence levels (normal, mildly retarded, and moderately retarded). The findings in patterns of adaptive behavior in this study indicated the strengths and deficiencies which serves as a useful tool when making a diagnosis of mental retardation or placing an individual in the most suitable environment. The result of exploring the relationship between intelligence and adaptive behavior of the mentally retarded contended that intelligence and adaptive behavior are two related but separate constructs and demonstrated the importance of using an adaptive behavior measure during the identification procedures.

As described by Meyers, Nihira, and Zetlin (1979), the following two issues cause the increased interest in the assessment of adaptive behavior: (a) growing criticism over the use of intelligence tests to classify minority individuals as mentally retarded because of the potential bias in intelligence tests; (b) concerns about characteristics of mentally retarded people in institutions led to the need to teach them adaptive skills for placement in community settings or deinstitutionalization. In Taiwan, mainstreaming also is the current trend in educating the mentally retarded, therefore, adaptive behavior is indeed important for both the diagnosis and intervention needs. Also, the Article 2 of the Special Education Law of ROC clearly stated rehabilitation and vocational education should be stressed for the physically and/ or mentally retarded. It is anticipated that the importance of adaptive behavior assessment should increase in the coming years in Taiwan, ROC.

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智能不足學生之適應行為研究

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本研究的主要目的乃在探討輕中度智能不足學生之適應行為，主要之研究問題有二：(1)智障與一般學生間之適應行為結構是否有顯著差異？(2)智力與適應行為是否有顯著相關？研究對象為368名國中小智障生與541名國小一至六年級及國中一年級的一般學生，以新修訂的文蘭適應行為量表與魏氏兒童智力量表為研究工具，所得資料經因素分析、叢集分析、獨立樣本 t 考驗、皮爾遜相關分析、迴歸分析等統計處理，結果發現：(1)智障與一般學生之適應行為均係由認知與心理動作二因子組成的結構體；(2)智障者的適應行側面圖不同於一般學生，其最顯著之缺陷領域為溝通，次領域為書寫，其次依序為表達性及社區；(3)智障者的適應行為顯著低於一般學生，中度智障者的適應行為顯著低於輕度智障者；(4)智障者的智力與適應行為有輕至中度之相關存在；(5)如僅用智力為鑑定標準，約有8%的學生被誤診為智障者。本研究並提出有關之建議事項以供參考。

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僱主聘用弱智人士的因素

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很多研究顯示弱智人士的公開就業率非常低。僱主所持的負面態度很可能是影響就業機會的因素。這調查在香港舉行並研究六十六間聘用弱智僱員的公司及工廠、要求僱主對二十二項有關聘用時所作的決定而作評估。結果顯示僱主甚為關注僱員的生產力、亦表示僱用弱智人士並不會引起成本上漲。

緒論

一個英國調查（Hirst, 1987）指出在所查的二百七十四名傷殘中學畢業生中，只有百分之五能找到公開就業。根據美國總統有關傷殘者就業委員會估計，每年六十五萬傷殘畢業者中，只有百分之二十一能成功地找到全職工作，而百分之二十六將會接受福利。就算找到工作的人中，百分之四十將會開工不足，而其工資亦會在貧窮的水平（Patton, 1985）。雖然教育的成果含有準備日後工作的意思，但百分之五十五至七十的傷殘人士仍然是失業的（U. S. Commission on Civil Rights, 1983）。在香港弱智人士的就業情況亦不甚樂觀。在一九八九年，只有百分之九的弱智畢業生能得到公開就業，而百分之六十會接受進一步的訓練或到庇護工場工作，其餘的（即百分之三十一）均是失業的（Tse, 1991）。

雖然沒有人能保証畢業後必能找到工作，但如果三分一的畢業生在結業多年後仍然處於失業狀態，這就浪費很多資源了，因此找出低就業率的因素是刻不容緩的。很多研究顯示，弱智人士不能適應工作的原因是基於其個人特質（Greenspan & Shoultz, 1981; Sali & Amir, 1971）。另一個可能性是一般僱主所持的負面態度。一個透過電話訪問的研究（Ligato & Unterwagner, 1975）顯示出三十一位僱主中的百分之七十一對聘用弱智人士有負面的意見。為了促進未來的就業機會，有必要去研究甚麼因素影響僱主聘用弱智人士。例如學者（Mithaug, 1979）在調查聘用的重要因素。很多研究証據顯示大部份的僱主對用弱智人士有消極的心態（Grueenhagen, 1982; Ligato & Unterwagner, 1975）。可反映一般都缺乏研究來探討僱主對聘用弱智人士的態度上的實質調查。

本文的目的是研究僱主在決定聘請弱智人士的因素。香港是一個世界著名的商業城市，在聘用員工時僱主所作的決定是反映一般公司、工廠的要求。希望本研究可以刺激到僱主對僱用弱智人士的興趣及關注。

研究方法

香港勞工署提供了三百六十個僱用弱智人士僱主的地址，其中抽樣三分一用電話聯絡是