Measuring Adaptive Behaviour: The Relationship Between The Minnesota Child Development Inventory and the Vineland Adaptive Behavior Scale.

by

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ABSTRACT

The relationship between the Vineland Adaptive Behavior Scale (VABS) and the Minnesota Child Development Inventory (MCDI) was examined in a clinical sample of preschool-aged children by means of canonical correlation, redundancy analysis and multiple regression. The relationship between adaptive behaviour and intelligence was also considered by relating the VABS and the MCDI to each of four intelligence tests, and to a composite intelligence estimate derived from combined information obtained from comparable intelligence tests in this sample.

There was a strong relationship between the VABS and the MCDI. The MCDI scales accounted for 43.6 % of the variance in the VABS domains and the VABS domains accounted for 39.88 % of the variance in the MCDI scales. All of the MCDI scales except the Personal Social scale contributed to the variance accounted for on each of the VABS domains in multiple regression analyses where each VABS domain was a separate criterion measure.

The hypothesized moderate relationship between adaptive behaviour and intelligence was confirmed. The composite intelligence estimate and each tests' composite were related to the VABS. With the exception of the Stanford-Binet 1972 edition IQ and the Stanford-Binet IV Composite, these measures were also related to the MCDI.

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Table of Contents

List of Tables

Introduction

Issues in the Assessment of Adaptive Behaviour

The concept of adaptive behaviour refers to the ability of a person to perceive, cope with and adjust to the demands made in a given social situation in an age-appropriate manner (Coulter & Morrow, 1978; Keith, Fehrmann, Harrison & Pottebaum, 1987). Adaptive and social competence is involved whenever a child is interacting with other people. Children must adapt their behaviour and conversation to the situations they find themselves in. For example, they must know what to do and say on the first day of school each year, and they must know how to interact when playing in the playground or in the neighbourhood. Adaptive behaviour is a concept that is taken for granted in routine day-to-day interactions but one which becomes particularly salient when it is poor or distorted. When looking at any deviation from a normal pattern of development, the concept of adaptive behaviour is important. Disturbances in the area of adaptive functioning may well be an important part of the symptom picture of a given disorder. If adaptive behaviour is not assessed, a child who has a critical problem in social situations specifically may have this difficulty overlooked.

The focus of clinical assessment is to attempt to understand the basic components that contribute to a given disorder. Adaptive behaviour is a complex and multifaceted area of human behaviour that is affected and determined by behaviours that are basic to all areas of functioning. Functions that underlie adaptive difficulties may also underlie cognitive or intellectual difficulties, but this will not necessarily be evident unless both the level of adaptive competence and the component behaviours of which it is comprised are individually assessed (Gaddes, 1985; Myklebust, 1975; Rourke, 1988). Alternatively, if social or adaptive ability is a primary component, then adaptive dysfunction may affect other areas of functioning (Freeman, Ritvo, Yokota, Childs & Pollard, 1988). In either case, it is critical that adaptive behaviour be assessed.

The concept of adaptive behaviour to date has been given inconsistent treatment in the neuropsychological literature, despite the fact that adaptive behaviour assessment has become a necessary component of the basic information neuropsychologists gather (Reschly, 1982). In diagnoses such as autism and non-verbal learning disabilities, where adaptive and social dysfunction are thought by some to be primary symptoms, the issue of the neuropsychology of adaptive behaviour has begun to be considered (Freeman et al., 1988; Rourke, 1988). Much of the neuropsychological literature on adaptive behaviour is embedded within the literature on nonverbal learning disabilities (Gaddes, 1985). Social and adaptive dysfunction have been conceptualized as consequences of damage to or dysfunction of white matter (Rourke, 1988), with a possible preponderance of right hemisphere impairment (Myklebust, 1975; Rourke, 1982). Myklebust (1975) submits that although they are not necessarily as obvious as impairments of verbal functioning, nonverbal dysfunctions can be much more debilitating. This is the case "because a weak ability for social perceptions limits one's inner experience, and ... this has an impoverishing effect on all deductions and adaptive learning" (Gaddes, 1985, p. 362).

No matter what impairment a child may have, it is a given that the child will still interact in some manner with the world. If the profile of adaptive abilities of each child is delineated, resources such as access to various rehabilitation programs, custodial care, etc., could be allocated more efficiently on the basis of the highest, rather than the lowest, level of functioning (Myklebust, 1975). If a child were to require help in an area of adaptive and social functioning and this difficulty were not detected, then programs designed to deal with the child's other problems, such as cognitive skills training, might not have a successful outcome. A child may not be capable of successfully implementing the new learning if he or she does not know how to cope with social demands.

The literature does not include a well-founded, comprehensive theory of adaptive behaviour (Harrison, 1987; Kamphaus, 1987a; Reschly, 1982). The recent research has been governed mostly by attempts to understand the multitude of tests of adaptive behaviour that have been published in the last two decades. Among the most well known of these tests are the AAMD Adaptive Behavior Scale (Nihira, Foster, Shellhaas & Leland, 1975), the Adaptive Behavior Inventory for Children (Mercer & Lewis, 1978), the Scales of Independent Behavior (Bruininks, Woodcock, Weatherman & Hill, 1985) and the Vineland Adaptive Behavior Scales (Sparrow, Balla & Cicchetti, 1984). Each test operationalizes adaptive behaviour slightly differently. There does not seem to be a generally accepted, objective concept of adaptive behaviour that is independent of the tests used to measure it (McGrew & Bruininks, 1989).

The modern concept of adaptive behaviour owes much to the work of Edgar Doll. His work has been the hallmark for modern understanding of adaptive behaviour and provides one of the few theoretical discussions in this area of research. Doll (1935, 1940) stated that the need for a psychological diagnosis only arises from a problem or occurrence in a social context. He suggested that maintaining this social base as the foundation when addressing any problem clarifies the assessment and diagnosis of the specific difficulty. He emphasized that social competence, now termed adaptive behaviour, matures with development and, in addition, that it is one of the key elements to consider in an assessment of mental incompetence or deficiency.

The modern definition of adaptive behaviour differs very little from Doll's. "Adaptive behaviour is defined as the effectiveness or degree with which an individual meets the standards of personal independence and social responsibility expected for age and cultural group" (Reschly, 1982, p. 221-222). Adaptive behaviour is evaluated in the realms of independent functioning, personal responsibility and social responsibility. It is evaluated in terms of age appropriate criteria in the appropriate cultural contexts.

In assessing adaptive behaviour a number of factors must be taken into account. Whether one is taking a situationally specific or generalized perspective on adaptive behaviour, and whether one is examining maximal or typical performance are critical issues that will affect the final rating of adaptive competence (Reschly, 1982). A situationally specific perspective may focus on behaviours that are adaptive in certain contexts such as the home or classroom, whereas a more generalized perspective would lead to an assessment of a broad range of more universally necessary adaptive traits in a broad range of contexts. A maximal performance assessment would produce a profile of what a child is potentially able to accomplish. A typical performance assessment would yield a perspective on what a child does regularly. In addition, whether a given test of adaptive behaviour is norm-referenced or criterion-referenced will affect the profile that emerges (Cone, 1987; Evans & Bradley-Johnson, 1988). Norm-referenced tests make a judgement about a child's adaptive behaviour competence on the basis of comparison to a group standard of what is expected for the child's age or cultural group. Criterion-referenced tests establish a definition of what competence is in a given area; the child's performance in this area is then compared to this standard of competence. Finally, one must consider whether the information required is for classification and placement purposes or intervention and program planning purposes. These assessment/measurement issues are critical as they seem to affect the structure of adaptive behaviour definitions that emerge, even though as one might expect, the characteristics of adaptive behaviour do not change when a variety of subject samples are tested (McGrew & Bruininks, 1989).

The research literature seems to support a multidimensional structure of adaptive behaviour (Reschly, 1982). The consensus appears to be that there are two major factors; however the labels they are given often imply differing meanings. Reschly (1982) discusses the dimensions of autonomy and responsibility whereas Roszkowski & Spreat (1983) use the terms behavioural competence and behavioural control. Autonomy is conceived of as self-motivated independent functioning; responsibility concerns the performance of tasks that are expected within a social situation. Behavioural competence "is concerned with skills needed to maintain an independent existence... and ... behavioural control deals with social and emotional behavioural problems" (Roszkowski & Spreat, 1983, p. 454). These distinctions become important because they affect one's understanding of the very construct of adaptive behaviour. Roszkowski & Spreat (1983) indicate that when adaptive behaviour is defined in terms of behavioural competence it is very similar to the definition of intellectual potential. When adaptive behaviour is defined in these terms the correlation between IQ and adaptive behaviour is quite substantial.

At the theoretical level, it is clear that adaptive behaviour and intelligence could not be considered independent constructs because both are required for successful interaction in the social world. At the practical level, in 1961 adaptive behaviour assessment became an additional requirement to the measurement of IQ for a classification of mental retardation (Reschly, 1982).

Both of these constructs are now considered necessary aspects of assessing mental retardation (Zigler, Balla & Hodapp, 1984). As this was not always the case, the understanding of adaptive behaviour has grown as the understanding of tests of intelligence has grown. Since adaptive behaviour is assessed in appropriate cultural contexts, adaptation in the educational or school context should be considered. This area of assessment necessarily overlaps considerably with the assessment of intellectual potential and school achievement. One of the conventional, statistical indicators of whether a given instrument is a measure of overall adaptive competence or intelligence is the correlation that instrument has with an accepted test of intelligence (Reschly, 1982). Measures of adaptive behaviour usually have only modest correlations with traditional intelligence tests (Kamphaus, 1987b; Zigler et al., 1984). It would thus seem important to consider the correlational relationship between adaptive behaviour and intelligence.

The Vineland Social Maturity Scale

Each of the components of adaptive behaviour measurement (eg. situationally specific or generalized perspective, norm- or criterion-referencing, classification/placement or intervention/programming purposes) have had varying degrees of influence in psychology. This influence has been felt when a test that emphasizes certain of these components has received wide exposure. One of the most influential tests has been the Vineland Social Maturity Scale (VSMS; Doll, 1953; 1965), Doll's original measure of social competence. The VSMS is still one of the more popular and widely known measures of adaptive competence (Coulter & Morrow, 1978).

The VSMS was one of the earliest instruments to make use of the semi-structured interview format. The VSMS interviewer is trained to administer and score the questionnaire in an interview with a person who is close to and knows well the person about whom information is required. The VSMS consists of 117 questions in their hypothesized order of increasing developmental difficulty about the typical behaviour of the child. The questions are grouped into eight theoretically devised scales: Self-Help General, Self-Help Eating, Self-Help Dressing, Locomotion, Occupation, Communication, Self-Direction, and Socialization. The VSMS is an age scale; it yields a Social Age score which can be converted into a ratio Social Quotient. The normative Social Age and Social Quotient means and standard deviations were collected from a sample of 620 white, middle class subjects - 10 of each sex at each age level from birth to age 30 (Salvia & Yesseldyke, 1988).

There are certain weaknesses of the VSMS that prompted its extensive revision in 1984. It has an age scale scoring system and inadequate standardization and normative data (Holden, 1984; Kamphaus, 1987b). The test does not provide either standard scores or accurate percentile scores (Oakland & Houchins, 1985). In addition, the manual contains no empirical confirmation of the validity of the eight scales of adaptive functioning.

The Vineland Adaptive Behavior Scale

The 1984 revision of the VSMS resulted in the Vineland Adaptive Behaviour Scales (VABS; Sparrow et al., 1984). The VABS retains the theoretical approach to adaptive behaviour and its assessment pioneered by Doll. Sparrow et al. (1984) operationalize the definition of adaptive behaviour as "the performance of the daily activities required for personal and social sufficiency" (Sparrow et al., 1984, p.6). Inherent in this definition are the guiding principles that any definition of adaptive behaviour "is age-related,...is defined by expectations or standards of other people...and is defined by typical performance, not ability" (Sparrow et al., 1984, p.6).

The VABS has two parent interview editions, the Survey Form and Expanded Form, and a Classroom Edition. Like its predecessor, the VABS relies on the gathering of information from a semi-structured interview with a third party who is very familiar with the natural, day-to-day behaviour of the individual. The VABS-Survey Form is designed to assess strengths and weaknesses in areas of adaptive behaviour from birth through age 18. It consists of 297 questions requiring 20 to 60 minutes to administer (Sparrow et al., 1984).

The VABS is multidimensional as is the VSMS. It contains 4 domains: Communication, Daily Living Skills, Socialization and Motor Skills. These 4 domains are divided into 11 subdomains: Receptive, Expressive and Written Communication, Personal, Social and Community Daily Living Skills, Interpersonal Relationships, Play and Leisure Time and Coping Skills in the Socialization Domain and Gross and Fine Motor Skills. The VABS also yields an Adaptive Behaviour Composite (ABC) and a Maladaptive Behaviour domain. Standard scores, percentile ranks, age equivalents and adaptive levels have been determined for the 4 adaptive behaviour domains and the Adaptive Behaviour Composite. The standardization sample was randomly selected to conform to relevant characteristics of the 1980 United States census figures. There were 50 males and 50 females in each age group from birth to 18 years, 11 months (Sparrow et al., 1984).

The literature suggests that the VABS provides a valid and broad assessment of adaptive and social behaviour (Holden, 1984; Lehr, Yesseldyke & Thurlow, 1987; Mott, Fewell, Lewis, Meisels, Shonkoff & Simeonsson, 1986). The VABS has solved the problems in the VSMS with standardization, the provision of standard scores and percentiles, and the provision of normative data as bases of comparison. Since its publication the VABS has been the focus of a number of reviews and critiques. A few weaknesses have been suggested, many of which are still open to debate. Kamphaus (1987b) states that children from low socio-economic status homes may have been underrepresented in the standardization sample. Kamphaus (1987b) and Oakland & Houchins (1985; 1987) have suggested that the reliability coefficients for the subdomains are low and advise caution in their interpretation. Silverstein (1986) suggests that "although standard scores are supposed to have a mean of 100 and an SD of 15 for each age group in the standardization sample, the means and SD's actually vary considerably from age group to age group" (Silverstein, 1986, p. 1). If this is indeed the case, the problem in interpretation that arises is that a given standard score may "reflect different levels of performance" (Silverstein, 1987, p.376) on an individual level in relation to critical cut-off values or in comparisons across age levels and between different people.

Cicchetti & Sparrow (1986a; 1986b) have responded to and provided their defense for each of these criticisms. They explain that the seemingly low reliability coefficients are artifacts of the restricted range of variability in certain age ranges for some subdomains (Cicchetti & Sparrow, 1986b). The authors further submit that the fluctuation in standard scores can be attributed to sampling variability and that it is not significant when Type I error is controlled for (Cicchetti & Sparrow 1986a). As yet the issues have not been resolved and some caution should perhaps be exercised when comparison of standard scores across individuals, ages or between different sub-domains is necessary. Nevertheless, it is clear that the consensus in the literature is that the VABS is a valid, reliable and valuable addition to the field of adaptive behaviour assessment.

The VABS Survey Form has been used in many studies with a variety of populations (Bensberg & Irons, 1986; Freeman et al., 1988; Lehr et al., 1987; Sparrow & Cicchetti, 1985; Sparrow, Rescorla, Provence & Condon, 1986). It is one of the more popular adaptive behaviour tests used by the American early childhood special education programs and the only test of adaptive behaviour that meets standards of technical adequacy (Lehr et al., 1987). In particular, a number of authors have addressed the issue of the relationship between cognitive and adaptive functioning with a variety of populations including autistic children (Freeman et al., 1988), mentally retarded children (Bensberg & Irons, 1986), and children diagnosed with atypical pervasive developmental disorder (Sparrow et al., 1986). These studies have all found the VABS useful in clarifying the relationship between social and intellectual difficulties in children and in illuminating directions for further exploration.

The Minnesota Child Development Inventory

How the psychometric properties of a given test can colour the results obtained and their consequent interpretation is also relevant in other contexts that affect one's thorough understanding of adaptive behaviour testing. A common criticism in childhood assessment is the confusion created by multiple measures and labels of the same behavioural phenomena (Achenbach & Edelbrock, 1984; Boyle & Jones, 1985; Evans & Bradley-Johnson, 1988). With the wide variety of techniques, questionnaires and rating scales available to assess behavioural disorders in children, the validity, number and nature of syndromes they will "uncover" depends on the number and content of items, the breadth of the area of behaviour the instrument is targeted for, whether analyses are done with clinical samples or with non-clinical samples (where instances of deviant behaviours are much more rare), and on methodological factors such as the choice and nature of statistical techniques (Achenbach & Edelbrock, 1981; 1984; Boyle & Jones, 1985). In adaptive behaviour assessment it has become clear that psychometric measurement issues such as the perspective of the items (situationally specific or generalized and sampling typical or maximal performance), the basis for establishing the presence of a problem (comparison to norms or behavioural criteria) and the purpose of the assessment (classification or program planning) can affect the profile of adaptive competence that emerges. It would therefore be of some empirical utility if research could establish that different measures of adaptive behaviour provide essentially the same information to the psychologist.

An excellent illustration of the aforementioned issues in the context of adaptive behaviour assessment is the use of the Minnesota Child Development Inventory (MCDI; Ireton & Thwing, 1974) as a measure of adaptive ability. The authors developed the measure "for the preliminary identification of the child whose development is below expectations for his age and sex" (Ireton & Thwing, 1974, p.1). Because of the breadth of this definition and the areas of functioning sampled in the questionnaire, the MCDI has been used in a variety of situations. A number of authors have found it useful in screening general cognitive ability (Byrne et al., 1987; Colligan, 1981; Dean & Steffen, 1984; Gottfried, Guerin, Spencer & Meyer, 1983; 1984; Kenny, Hebel, Sexton & Fox, 1987; Sturner, Funk, Thomas & Green, 1982; Ullman & Kausch, 1979). It has been used to predict more specific aspects of cognitive ability such as reading success (Colligan, 1976; 1981). The MCDI has also been used in the identification, assessment and diagnosis of children at risk for developmental disability (Byrne et al., 1986; Colligan, 1977; Eisert, Spector, Shankaran, Faigenbaum & Szego, 1980; Ireton Thwing & Currier, 1977), and in discriminating among types of behaviour problems (Garrity & Servos, 1978).

The MCDI is a 320 item, yes-no format questionnaire that surveys behaviours or activities that young children from the ages of 6 months to 6.5 years may have mastered or are currently engaged in. It asks about actual, functional behaviours and their age and situational appropriateness. The items are "rationally grouped into 7 scales representing specific areas of importance in a child's development" (Colligan, 1984, p.473). The scales are Gross Motor, Fine Motor, Expressive Language, Comprehension Conceptual, Situation Comprehension, Self Help and Personal-Social. The

MCDI also yields a General Development Index which consists of the most powerful age discriminating items from the questionnaire. Like the VABS, the MCDI is completed by someone who knows well the child in question -- usually this is the mother.

The MCDI was normed on the responses of mothers of 796 middle class, suburban children - 401 girls and 395 boys. The inadequacy of the normative sample is the main criticism directed toward the MCDI (Colligan, 1984; Goodwin, 1978; Rysberg, 1985). Despite this technical weakness, which is acknowledged by the authors with the appropriate accompanying cautions, the MCDI has received wide clinical use. A number of researchers emphasize that its value increases if local cut-off scores or norms are collected (Byrne et al., 1986; Colligan, 1984; Ullman & Kausch, 1979). Certain studies have also found the MCDI to be a valid indicator of developmental strengths and weaknesses with lower socioeconomic status (SES) samples (Eisert et al., 1980; Ullman & Kausch, 1979).

The MCDI scales were created based on the clinical experience of the authors and extensive review of the child development literature. This information led to the current groupings of the scales (Ireton & Thwing, 1972; 1974). This rational grouping of scales has been suggested as a potential weakness of the MCDI. Goodwin (1978) cites the high magnitude of the intercorrelations between the scales as evidence that the content sampled by each is not as circumscribed as the authors would have hoped. Despite criticisms, most authors still find the scales to be clinically relevant and useful (Byrne et al., 1986; Colligan, 1984). Rogers (1975) did factor analyze 80 MCDI items and found no significant differences between the predictive validity of the factor scales and the "intuitive-rational" scales.

Internal consistency of the scales was established using the split-half method (Ireton & Thwing, 1974), and is considered satisfactory (Goodwin, 1978). Goodwin (1978) suggests that the validity data provided in the manual are somewhat limited. The data are based only on the ability of the scores to discriminate among different age groups of children. Subsequently, a number of authors have tested and supported the concurrent (Byrne et al., 1986; Gottfried et al., 1983; 1984) and criterion (Ullman & Kausch, 1979) validity of the MCDI. Byrne et al. (1987) and Kenny et al. (1987) found that the MCDI also shows good clinical validity in that it accurately characterizes the developmental status of preschool children. Byrne et al. (1986) mention one other technical characteristic of the MCDI which is worth noting. The MCDI uses percentage cut-off scores, rather than conventional standard scores, to define an individual's results. The profile details the percent value of how much a child's score on a scale falls below that expected for his or her age. Twenty percent below age level is the cut-off recommended for considering a profile normal. Between 20 and 30 percent below age level, a scale is considered "borderline"; when a score is more than 30 percent below age level it is considered "retarded" (Ireton & Thwing, 1974). This approach to classification can complicate the direct comparison of MCDI results to the standard score expressions of many other tests.

Clinically, the MCDI can be seen to possess many of the characteristics of an adaptive behaviour measure. Its scales sample behaviours in the areas traditionally considered of key importance in defining adaptive competence. In some clinical settings, including the Arbutus Society for Children in Victoria BC, the MCDI is being used to gather information regarding adaptive behaviour. However, the empirical question of its utility as a measure of adaptive competence has not been adequately addressed in the literature. To date only three studies even mention the MCDI in relation to adaptive behaviour (Guerin & Gottfried, 1987; Ireton & Thwing, 1972; Ullman & Kausch, 1979). Guerin & Gottfried (1987) examined one aspect of the relationship between the MCDI and the VABS. They investigated the ability of the MCDI scores from age

2.5 to predict scores on the VABS at age 6. All MCDI scales except the gross motor scales correlated significantly with the Vineland domains. The significant correlations ranged from *r* = .20 to .57. The authors concluded that there was a moderate relationship between the MCDI and the VABS given 3.5 years later. Demonstrating a substantial, statistical equivalency between the MCDI and a hallmark measure of adaptive behaviour such as the VABS could serve to refine adaptive behaviour assessment.

The MCDI and the VABS in Relation to Measures of Intelligence

As was previously stated, there is no comprehensive theory governing research about adaptive behaviour. However, because of the nature of the definition of adaptive behaviour requiring it to be assessed in appropriate situational and cultural contexts, the relationship of the MCDI and the VABS to measures of intellectual potential ought to be considered.

There is a fair amount of literature that relates the MCDI to intelligence tests. Guerin & Gottfried (1987) found that the MCDI has a positive and significant relation to measures of intelligence. Byrne et al. (1986) found a correlation of *r* = .60 between the MCDI General Development Index (GDI), and the Bayley Mental Scale in a sample of infants with a mean age of 21 months suspected of being developmentally delayed. In their preschool sample, with a mean age of 45 months, the correlation between the MCDI GDI and the McCarthy Scale of Children's Abilities General Cognitive Index (GCI) was $\underline{r}$ = .52. Dean & Steffen (1984) obtained a correlation of $\underline{r}$ = .38 with the McCarthy GCI in a normal preschool-aged sample. Gottfried et al. (1983), in a random sample of 30 month old children, found that the MCDI GDI correlated with the McCarthy GCI in the range of .56 - .63. Kenny et al. (1987) reported a correlation of $\underline{r}$ = .49 between the MCDI GDI and the McCarthy GCI in a paediatric referral sample with a median age of 36 months. Eisert et al. (1980) did follow-up testing of premature low birth weight infants at a mean age of 41 months on the MCDI and the McCarthy or the 1972 Stanford-Binet intelligence tests. The McCarthy GCI correlated $\underline{r}$ = .48 with the MCDI GDI and the Stanford-Binet IQ correlated at $\underline{r}$ = .55. The results suggested to the authors that the two intelligence tests have comparable relationships to the MCDI. Sturner et al. (1982) used a shortened form of the MCDI GDI to predict Stanford-Binet scores in a sample of preschoolers. They found that its sensitivity (correct identification) was .63 and its specificity (correct classification) was .81 (See Table 1). Bickett, Reuter & Stancin (1984) compared the mental ages on the McCarthy GCI and the Stanford-Binet to

Table 1

The MCDI GDI in Relation to Tests of Intelligence

Test	Sample	Correlation
Bayley		
Byrne et al. (1986)	infants	.60
McCarthy		
Byrne et al. (1986)	preschool	.52
Eisert et al. (1980)	premature, low birth weight preschool	.48
Dean & Steffen (1984)	normal preschool	.38
Gottfried et al. (1983)	30 month old random	.56 - .63
Kenny et al. (1987)	36 month old paediatric referral	.49
Stanford-Binet 1972 edition		
Eisert et al. (1980)	premature, low birth weight preschool	.55
Sturner et al. (1982)	random preschool	sensitivity .63 specificity .81

the MCDI developmental age for the GDI in a sample of moderately mentally retarded children aged 6.5 to 11.6 years. The McCarthy GCI yielded a correlation of $r = .73$ with the MCDI and the Stanford-Binet yielded a correlation of $r = .67$. Colligan (1977) reported a correlation between the MCDI developmental age and the mental age on the Stanford-Binet, the Bayley Mental Scale and the Cattell Infant Intelligence Scale or $r = .92$ (See Table 2). The method of comparison in the latter two studies was not fully elaborated. As can be seen from Tables 1 and 2, the correlations between the MCDI and a variety of intelligence tests in a variety of samples ranges from $r = .38$ to .92.

In non-correlational research, Ireton et al. (1977) compared the MCDI subject classifications of normal, borderline and retarded; they found that the MCDI profile correctly classified 99% of cases of borderline or retarded IQ scores on the Stanford-Binet or the WPPSI. The MCDI GDI alone correctly classified 85% of children who scored in the retarded range. The authors suggested, however, that the MCDI was not useful in accurately classifying normal intelligence.

Sparrow et al. (1984), in the manual for the VABS, discuss its criterion validity in relation to a number of tests of intelligence. They reported a correlation of $r = .32$ between the Vineland ABC and the Kaufman Assessment

Table 2

The MCDI Developmental Age in Relation to Mental Age on Intelligence Tests

Test	Sample	Correlation
Bayley, Cattell & Stanford Binet 1972 edition		
Colligan (1977)		.92
McCarthy		
Bickett et al. (1984)	moderately retarded, 6.5 to 11.6 years	.73
Stanford-Binet 1972 edition		
Bickett et al. (1984)	moderately retarded, 6.5 to 11.6 years	.67

Battery for Children (K-ABC) Mental Processing Composite (MPC). They also found that the Vineland ABC correlation with various measures of intelligence tended to be higher in the supplementary normative samples, r = .20 to .70. The relationship differed with the type of impairment in each group. Freeman et al. (1988) reported a correlation of r = .72 between the Vineland ABC and the WISC-R full scale IQ in a group of autistic children with a mean age of 10.2 years. In a study with a sample of children with "atypical" developmental patterns and normal controls, Sparrow et al. (1986) found that the WISC-R was not related to differences between the two groups. However the Vineland ABC significantly discriminated between the two groups.

The VABS and the K-ABC results for the children who were subjects in the standardization sample for both tests were factor analyzed by Keith et al. (1987) to determine the best statistical model to explain the relationship between adaptive behaviour and intelligence. They found that the best model of the relation between these two constructs was one that specified each as separate but related.

It is clear from this review that the relationship of both the MCDI and the VABS to measures of intelligence is quite variable. For the most part, the correlations tend to be in the low to moderate range. However, the magnitude of the relationship can also depend upon the characteristics of the sample being tested. Variables such as age, socioeconomic status (Sturner et al., 1982; Ullman & Kausch, 1979), and type and extent of disability of the persons tested are among those to be considered.

The Comparability of Different Measures of Intelligence

The nature of clinical research is such that a variety of intelligence tests are often administered depending upon the suitability each has to a particular child's difficulties. Therefore, the degree of relationship and comparability of a number of different measures of intelligence becomes a necessary area of investigation. The measures that need to be investigated for comparability are the Kaufman Assessment Battery for Children (K-ABC; Kaufman & Kaufman, 1983a), the McCarthy Scales of Children's Abilities (MSCA; McCarthy, 1972), the 1972 edition of the Stanford-Binet Intelligence Scale (SB72; Terman & Merrill, 1973), the Fourth Edition of the Stanford-Binet Intelligence Scale (SB4; Thorndike, Hagen & Sattler, 1986) and the Wechsler Preschool and Primary Scale of Intelligence (WPPSI; Wechsler, 1967).

Rogers & Holmes (1987) discuss the requirements that individually administered intelligence tests must meet in order to be considered comparable. The tests must be functionally, psychologically and statistically equivalent.

Functional equivalence "is based on the simple face validity of tests having a common name and claim" (Rogers & Holmes, 1987, p. 18). Schakel (1986) in a review of instruments used for the assessment of cognitive competence states that all of the aforementioned tests purport to measure general intelligence and knowledge acquisition - thus establishing their functional equivalence. Psychological equivalence is "based on an analysis of the similarity of the psychological function measured by each test" (Rogers & Holmes, 1987, p. 18). In the preschool age range, all of these tests sample verbal and non-verbal behaviours (Krohn & Lamp, 1989; Schakel, 1986). Finally, statistical equivalence involves the magnitude of the relationship among the given measures.

There is much literature discussing the statistical relationship of various tests of intelligence. The manual of each test provides a discussion of the relationship of that test to other measures of intelligence. In addition, many authors have studied the concurrent validity of intelligence tests by means of correlational analysis or by testing for a mean difference between global 'IQ' standard scores obtained on different tests. Only one study of those available found a significant difference between mean IQ scores on two separate tests. Hayden, Furlong & Linnemeyer (1988) found that in a sample of 32 gifted 3rd and 4th grade children, the SB4 Composite was a significant 8 points higher than the K-ABC mental processing composite (MPC). The correlation between the K-ABC MPC and the SB4 Composite was r = .70, a fairly substantial relationship. A summary of the correlational information regarding the K-ABC is provided in Table 3.

Kaufman & Kaufman (1983b) cite 3 studies addressing the comparability of the K-ABC MPC to other measures of intelligence. Two studies investigated the relationship of the K-ABC MPC the SB72 IQ. With 28 normal preschoolers whose mean age was 4.25 years, the correlation was r = .36 and with 28 high-risk preschoolers of the same mean age the correlation was r = .66. In a sample of 40 black children, with a mean age of 5 years, the correlation of the K-ABC MPC with the WPPSI FSIQ was r = .55.

Goldstein Smith & Waldrep (1986) obtained a correlation of r = .55 between the K-ABC MPC and the SB72 IQ in a sample of 40 randomly selected preschool children with a mean age of 36.3 months, from middle to lower-middle class families. Klanderman, Devine & Mollner (1985) obtained a correlation of r =.56 between the K-ABC MPC and the SB72 IQ in a sample of 41, 2nd to 4th grade upper middle class children. Krohn & Lamp (1989) examined the relationships between the K-ABC MPC, the SB72 IQ and the SB4 Composite. Their sample consisted of 89 Head Start children with a mean age of 59 months. The correlations of the K-ABC MPC with the SB72 IQ

Table 3

Correlation of the K-ABC with Other Tests of Intelligence

Study and Sample	n	SB72	SB4	WPPSI
		Test		
Kaufman & Kaufman (1983)				
1. High risk preschool, M age = 4.25 years	28	.66		
2. Normal preschool, M age = 4.25 years	28	.36		
3. Black children, M age = 5.0 years	40			.55
Goldstein et al. (1986) random normal sample, M age = 36.3 months	40	.55		
Klanderman et al. (1985) 2nd to 4th grade, upper middle class	41	.56		
Krohn & Lamp (1989) lower S.E.S. preschool, M age = 59 months	89	.66	.86	
Hayden et al. (1988) gifted children, M age = 9.3 years	32		.70	

and the SB4 Composite were *r* = .66 and *r* = .86 respectively. The correlation between the SB72 IQ and the SB4 Composite in Krohn & Lamp's study was *r* = .69 (See Table 4). A number of other studies have also addressed the relationship between the SB4 and the SB72. Thorndike, Hagen & Sattler (1986) cite 5 separate studies that correlate the SB4 with other intelligence measures. In samples of normal children of elementary school age, the correlation with the SB72 was *r* = .81, *r* = .89 with the K-ABC and *r* = .80 with the WPPSI (See Table 4). Correlations from two learning disabled samples were also reported. The correlation between the SB4 and the SB72 in a sample of 14 children with a mean age of 8.3 years was *r* = .79. The correlation of the SB4 with the K-ABC MPC was *r* = .66 in a sample of 30 learning disabled children with a mean age of 8 years 11 months.

The information available relating the MSCA to other tests of intelligence suggested that there was a moderately high correlation between the McCarthy General Cognitive Index (GCI) and other global intelligence scores. McCarthy (1972) reported a correlation of *r* = .71 between the GCI and the WPPSI Full Scale IQ (FSIQ) in a sample of children aged 6 to 6.5 years. The author also reported a correlation of *r* = .81 between the GCI and the SB72 IQ (See Table 5). Bickett et al. (1984) correlated the Mental Age scores from the MSCA GCI with the Mental Age from the SB72 in a sample

Table 4

Correlation of the SB4 with Other Tests of Intelligence

Study and Sample	n	SB72	K-ABC	WPPSI
Thorndike, Hagen & Sattler (1986)				
1. normal, M age = 6 years, 11 months	139	.81		
2. normal, M age = 7 years	175		.89	
3. normal, M age = 5.5 years	75			.80
4. learning disabled, M age = 8.3 years	14	.79		
5. learning disabled, M age = 8.9 years	30		.66	
Krohn & Lamp (1989) lower S.E.S. preschool, M age = 59 months	89	.69		

Table 5

Correlation of the McCarthy with Other Tests of Intelligence

Study and Sample	n	Test: SB72	Test: WPPSI
McCarthy (1972) normal, age's 6 to 6.5	35	.81	.71
Bickett et al. (1984)	21	.69*	

*correlation is between Mental Ages

of moderately mentally retarded children between the ages of 6.5 and 11.8 years. These authors obtained a correlation of r = .69 between the two mental age calculations.

Wechsler (1967) did report some investigation of the relationships of the FSIQ to other measures of intelligence. He found that in a sample of 98 children aged 60 to 73 months from one school the FSIQ correlated r = .75 with the SB72 IQ. Valencia (1984) looked at the relationship between the WPPSI FSIQ and the K-ABC MPC. The sample was 42 Mexican-American children with a mean age of 59.5 months enrolled in Head Start programs. The correlation between the two measures was r = .72. Finally, in another study involving the WPPSI FSIQ, Carvajal, Hardy, Smith & Weaver (1988) found that it correlated r = .59 with the SB4 Composite (See Table 6).

The intercorrelations among the K-ABC, the SB72, the SB4, the McCarthy and the WPPSI range from r = .36 to r = .89. There are enough converging sources of evidence to allow for the consideration of the statistical comparability of these measures of intelligence. In addition to the requirements of functional, psychological and statistical equivalence, Rogers & Holmes (1987) discuss one further requirement for establishing comparability of different individually administered intelligence tests, namely, that all of the intelligence tests must have been administered to

Table 6

Correlation of the WPPSI with Other Tests of Intelligence

		Test		
Study and Sample	n	SB72	SB4	K-ABC
Wechsler (1967) normal sample, ages 60 to 73 months, from a single school	98	.75		
Carvajal et al. (1988) middle class kindergarten	20		.59	
Valencia (1984) Mexican-American pre-school, M age = 59.5 months	42			.72

the same sample. If these four criteria have been fulfilled, then the intelligence tests can be considered equivalent. All of the tests can be converted to a common metric and considered together. Considering the tests equivalent can thus serve to clarify the analyses of clinical data.

Purpose and Hypotheses

There were two related purposes to this study. The first was to examine the relationship between the MCDI and the VABS in an attempt to refine understanding of adaptive behaviour and its psychometric measurement. The second purpose was to examine the relationship between adaptive behaviour and intelligence. This was to be accomplished in two ways. The relationship of the VABS and the MCDI to the K-ABC, the MSCA, the SB72, the SB4 and the WPPSI would each be examined separately. In addition, the relationship between adaptive behaviour and intelligence would be examined by relating both the MCDI and the VABS to a global measure of intelligence created from the combined information obtained from comparable tests in a single sample. It was expected that there would be a substantial relationship between the MCDI and the VABS, and that each of these tests would relate only moderately to a global intelligence measure.

Method

Subjects

The subjects were children who had been assessed by members of the Psychology Department at the G.R. Pearkes Centre for Children in Victoria, B.C. in the past three years and whose referral warranted the administration of the MCDI, the VABS and a global index of intelligence. The children attending Pearkes Centre consist largely of a preschool developmental disabilities population. It is from this population that the sample was drawn. The sample consisted of 111 children between the ages of 1 year, 9 months and 6 years, 3 months (M age = 4 years, 4 months). There were 72 male and 39 female children. Informed consent to release specified information in a child's psychology file for the purposes of research was obtained at the time of the assessment. Fourteen children did not have a valid or usable global intelligence score in their file. They were excluded from the analyses relating the MCDI and the VABS to the intelligence tests. Thus, the sample used to investigate the relationship of adaptive behaviour to intelligence consisted of 97 children - 62 males and 35 females. Four subjects were missing the Vineland Motor Skills Domain score; their data was inappropriate for inclusion in the canonical correlation described below. There were 107 subjects included in the analyses relating the MCDI to the VABS where the Motor Skills Domain was involved, otherwise all 111 subjects were included.

Materials

The Minnesota Child Development Inventory consists of 8 scales: General Development Index, Gross Motor, Fine Motor, Expressive Language, Comprehension Conceptual, Situation Comprehension, Self Help and Personal-Social. The MCDI has 320 questions; the parent or caregiver is to answer either 'yes' or 'no' as each question pertains to their child. Once the instructions have been thoroughly explained, the parent or caregiver may complete the questionnaire. The MCDI is not usually administered in a clinical interview format. The time required for scoring is approximately 30 minutes; the test was generally scored by a trained clerical support person using handscoring templates.

The Survey Form of the Vineland Adaptive Behavior Scale consists of 4 domains which are divided into 11 subdomains, an Adaptive Behaviour Composite and a Maladaptive Behaviour Domain. The domains are: Communication, Daily Living Skills, Socialization and Motor Skills. The subdomains are: Receptive, Expressive and Written Communication, Personal, Social and Community Daily Living Skills Interpersonal Relationships, Play and Leisure Time and Coping Skills in the Socialization Domain and Gross and Fine Motor Skills. The VABS consists of 297 items that are scored 2, 1, 0, N (no opportunity) or DK (don't know). The questionnaire is completed during the course of a clinical interview with a psychologist or psychology intern who has been trained in the administration of the VABS. The administration and initial scoring requires at least 90 minutes of clinical time, after which time the profiles can be computer scored. The VABS profile was scored using the Apple II microcomputer scoring program or handscoring templates.

One or more of five measures of intelligence were administered to the children: the Kaufman Assessment Battery for Children (K-ABC; Kaufman & Kaufman, 1983), the McCarthy Scales of Children's Abilities (MSCA; McCarthy, 1972), the 1972 edition of the Stanford-Binet Intelligence Scale (SB72; Terman & Merrill, 1973), the Fourth Edition of the Stanford-Binet Intelligence Scale (SB4; Thorndike et al., 1986) and the Wechsler Preschool and Primary Scale of Intelligence (WPPSI; Wechsler, 1967).

K-ABC. The K-ABC is administered with children aged 2.5 to 12.5 years. With a preschool population, 11 of the 16 possible subtests are administered. The global Mental Processing Composite scale (MPC) consists of a combination of these scales; it is a standard score scale with a mean of 100 and a standard deviation of 15.

MSCA. The MSCA is suitable for the assessment of children between the ages of 2.5 and 8.5 years. It consists of 18 subtests, 15 of which are used to calculate the General Cognitive Index (GCI) which is a standard score with a mean of 100 and a standard deviation of 16.

SB72. The SB72 is one of the most well established assessment instruments for preschool populations. It has normative data for the age range from 2 to 18 years. The SB72 yields only a single composite standard score, the IQ which has a mean of 100 and a standard deviation of 16.

SB4. The revision of the SB72, the SB4 retains the age range of its predecessor but allows for the calculation of other scale scores as well. It consists of 15 subtests; however, only 8 are administered in the preschool age range. The SB4 Composite standard age score has a mean of 100 and a standard deviation of 16.

WPPSI. The WPPSI is designed for the assessment of intellectual ability in the age range of 4 to 6.5 years. It consists of 12 subtests and 3 global standard score indices. The Full Scale IQ (FSIQ) has a mean of 100 and a standard deviation of 15. The WPPSI-R was not available when these data were collected.

Design and Analyses

The relevant information gathered from the past three year's consecutive referrals to the Department of Psychology at the G.R. Pearkes Centre for Children were the data for this study. Only files that contained the MCDI and the VABS were coded for analysis. If the file also included the scores of one or more of the K-ABC, SB72, SB4, WPPSI or MSCA global measures of intelligence, then this information was also coded.

The data were obtained during routine clinical assessments conducted by the child psychologist or psychology intern assigned to the case; the total number of psychology staff involved with this population was 5. As part of the G.R. Pearkes assessment practices, the parent or primary caretaker had been asked to complete the MCDI. The VABS had been administered by a child psychologist or psychology intern trained in its standardized, semi-structured interview format. The Maladaptive Behavior Domain of the VABS was not routinely administered. The child may also have been given at least one standardized measure of intelligence by one of the Department's child psychologists or interns. The scale scores for all the subtests and all the summary scores from every test of intelligence present in the file were entered as data. The subjects' demographic information consisting of age, sex and date of birth was obtained from the cover pages of the MCDI, the VABS, the intelligence test and the file's referral sheet. The age of the subject was determined by subtracting the date of birth from the most recent date of testing listed on either the MCDI or the VABS.

As part of the routine Department quality assurance practices approximately 10 % of the files had been checked for scoring errors by one of the child psychologists. The author rescored all of the remaining data except for 3 cases which were unavailable. Seventy-eight percent of the data was also double-checked for accuracy of computer entry for the analyses. The MCDI scales, the VABS domains and the global estimates of intelligence from each test were standardized to *T* scores with a mean of 50 and a standard deviation of 10 in order to facilitate their comparison (Cohen & Cohen, 1983).

Adaptive Behaviour. Canonical correlation was used to examine the strength of the linear relationship between the VABS and the MCDI (Cohen & Cohen, 1983; Schutz, Smoll & Gessaroli, 1983). Seven of the eight MCDI scales were used: Gross Motor, Fine Motor, Expressive Language, Comprehension Conceptual, Situation Comprehension, Self Help and Personal-Social. The General Development Index was not suitable for inclusion in this analysis because of its substantial overlap in content with the other MCDI subscales. The 4 VABS domain scale scores were the data entered in the canonical analyses: Communication, Daily Living Skills, Socialization and Motor Skills.

Canonical correlation allows for the examination of the multivariate relationships between two sets of data - a set of X, dependent or criterion variables (the 4 VABS domains) - and a set of Y, independent or predictor variables (the 7 MCDI scales). A prediction equation - or canonical variate - is established separately yet simultaneously for each set of variables. The first canonical correlation is the correlation that maximizes the relationship between the VABS variate and the MCDI variate. This first canonical correlation represents the first canonical root or dimension in the multivariate space consisting of the overlap of the VABS and the MCDI in that dimension. If the two data sets overlap in multivariate space, the canonical analysis can yield only as many canonical correlations as the number of variables in the smaller of the two data sets - the VABS or the MCDI. In this case, the number of possible canonical dimensions is four. Thus, after the first canonical dimension is found, the overlap of variance is examined for a second canonical dimension that is orthogonal to the first. This procedure is repeated until all four canonical dimensions are found. All four canonical dimensions are orthogonal to each other.

It was hypothesized that the multivariate $\underline{F}$ test of Wilks' Lambda would be significant; this would indicate a significant overlap in variance between the MCDI and the VABS. A measure of the percentage of variance in the total multivariate space accounted for by the relationship between the VABS and the MCDI is eta^2 (Rosenblood, 1990, personal communication). If:

$$eta^2 = 1 - \text{Wilks' Lambda}$$

then:

$$eta^2 \times 100 = \text{\% variance accounted for in the total multivariate space.}$$

The significant multivariate F lead to an examination of specific relationships between the two tests. The point of interest in this research was how the MCDI scales related to the VABS scales. As part of this examination, redundancy analysis of the canonical correlation output was undertaken (Stewart & Love, 1968). Redundancy analysis yields a measure of what percentage of the multivariate space is accounted for by each original set of variables - the VABS domains and the MCDI scales. Redundancy analysis is non-symmetrical because the number of variables in each data set (4 and 7 respectively) is non-symmetrical, thus it yields two indices. One is I_{VABS} an index of the proportion of variance of the VABS variables that is predictable from or redundant with the MCDI variables:

$$I_{VABS} = \frac{\sum R_{V1-4}^{2}}{4}$$

where R_{V1-4}^{2} = squared multiple correlation (multiple regression) between the set of MCDI variables and each VABS variable and

4 = number of VABS variables.

The other index, I_{MCDI}, is an index of the proportion of variance of the MCDI variables that is predictable from or redundant with the VABS variables:

$$I_{MCDI} = \frac{\sum R_{M1-7}^{2}}{7}$$

where R_{M1-7}^{2} = squared multiple correlation (multiple regression) between the set of VABS variables and each MCDI variable and

7 = number of MCDI variables.

As can be seen from the formulae, a redundancy index is the mean of the squared multiple correlations (multiple regressions) of each data set.

In order to better understand the specific relationships between the VABS domains and the MCDI scales four separate multiple regression analyses (Cohen & Cohen, 1983; Coulombe, 1984; Lambert, Wildt & Durand, 1988) where the MCDI scales were the predictor variables and each of the VABS domain scales was a separate criterion measure were further explored. The SAS/STAT all possible subsets procedure was employed (SAS Institute, 1987). This procedure generates output that lists all the possible combinations and order of entry of the MCDI predictor variables into the regression equation and generates the amount of variance accounted for, R^2, for each combination.

R^2 is the percentage of overlap between the MCDI predictors in the equation and the VABS criterion variable; however, as it is calculated by taking the least squares estimate of the relationship, it can capitalize on chance fluctuations in the data and thus is an overestimate of the relationship between the variables. Adjusted R^2 takes into account the chance variability in the sample and adjusts R^2 for the necessary degrees of freedom. Adjusted R^2 is considered the best predictor of the percentage of variance overlap (Cohen & Cohen, 1983).

The subset of MCDI scales that had the highest value of adjusted R^2 for each VABS domain was considered the best combination of predictors for that VABS domain.

<u>Adaptive Behaviour and Intelligence</u>. It was further expected that there would be a modest relationship of the MCDI and the VABS to the global measures of intelligence. In order to test this hypothesis, the correlation between both the VABS and the MCDI and each intelligence test's global index were examined.

The intelligence tests used were found to meet criteria necessary for establishing comparability of individually administered tests (Rogers & Holmes, 1987). That is, they could be considered functionally, psychologically and statistically equivalent, and they had all been administered to the same sample of children.

Therefore, as another test of the hypothesized moderate relationship between adaptive behaviour and intelligence, one scale score index of general intelligence from each of the subjects was chosen and used as that subject's score for a "composite intelligence estimate" variable. This new composite variable was converted to a T score with a mean of 50 and a standard deviation of 10.

More than one global index of intelligence was available for 61 children. Only one index per subject was necessary for computing the composite intelligence estimate, thus the choice of test was made in the following way. If there was a valid SB4 Composite based on the complete number of necessary subtests, this estimate was chosen as it was the most recently standardized measure of intelligence. If the SB4 Composite was based on too few subtests then the test with the most complete number of subtests contributing to the calculation of the global index was chosen. The next choices of test in descending order of preference were the K-ABC, the WPPSI, the SB72 and the McCarthy. This order was deemed appropriate based on the clinical appropriateness of each of these measures for estimating general intellectual potential in preschool children and the recency and adequacy of the normative data. The composite intelligence estimate for the 97 children for whom intelligence test data was available was composed of 54 SB4 Composite scores, 30 K-ABC

MPC scores, 12 SB72 IQ scores and 1 McCarthy GCI score. No WPPSI FSIQ scores were included because whenever the WPPSI was administered, another test that was preferable based on the aforementioned criteria had also been administered. The McCarthy GCI score was included as this was the child's only recorded global intelligence score.

Descriptive statistics and significant sex differences were reported for the Vineland domains, the MCDI scales, the K-ABC MPC, the SB72 IQ, the SB4 Composite and the WPPSI FSIQ. Only two children had a McCarthy GCI calculated therefore relationships with this variable were not meaningful. The global intelligence estimate was also included in all descriptive analyses.

Results

Descriptive Analyses

The means and standard deviations of the VABS domains and Adaptive Behavior Composite (ABC), the VABS subdomains and the MCDI scales are presented in Tables 7, 8 and 9 respectively. The normative mean and standard deviation for the VABS ABC and VABS domains are M = 100, sd = 15. As can be seen from Table 7, this sample is between 1.5 and 2 standard deviations below the normative means of 100; however, the variability in the VABS ABC and domains is similar to that expected from the normative data.

Two sex differences emerged in this sample. However the composition of the sample, 72 boys and 39 girls, must be taken into account when considering these differences. The greater number of boys is not unusual for a sample composed largely of developmentally disabled children (Gaddes, 1985; Myklebust, 1975). The girls had a significantly higher score on the MCDI Situation Comprehension scale (M = 32.54) than did the boys (M = 29.63), $F(1) = 6.55$, $p < .01$. On the SB4 Composite, the boys (M = 83.51, n = 41) had a significantly higher score than the girls (M = 74.59, n = 22), $F(1) = 6.45$, $p < .01$. The SB4 is not normed separately for males and females, thus the entire sample of 97 children was considered in the comparisons of intelligence measures to the VABS and MCDI.

Table 7

Means and Standard Deviations of the VABS Composite and Domains (n = 111)

	M	SD
Adaptive Behavior Composite	71	12
Domains		
Communication	75	13
Daily Living Skills	77	14
Socialization	78	11
Motor Skills (n = 107)	73	17

Table 8

Means and Standard Deviations of the VABS Subdomains

(n = 111)

	M	SD
Subdomains		
Receptive	22	2
Expressive	32	12
Written*	.81	1.8
Personal	44	10
Domestic	7	4
Community	8	4
Interpersonal Relationships	30	5
Play/Leisure Time	18	3
Coping Skills	5	3
Gross Motor (n = 109)	29	7
Fine Motor (n = 109)	21	5

*Because of the age range of the sample, the predominant score on this subdomain was 0.

Table 9

Means and Standard Deviations of the MCDI

	M	*SD*
General Development Index	89	21
Gross Motor	26	5
Fine Motor	33	5
Expressive Language	43	9
Comprehension Conceptual	36	14
Situation Comprehension	31	6
Self Help	26	6
Personal Social	26	6

The means and standard deviations of the composite scores of each intelligence test is reported in Table 10. The composite intelligence estimate for the 97 children who received a test of intelligence was a T score variable with a mean of 50 and a standard deviation of 10, thus it was not listed in Table 10. The mean IQ scores in this sample do not resemble that of a normal sample of children. Except for the WPPSI FSIQ and the K-ABC MPC, the mean scores for each test are more than 1 standard deviation lower than the standard score of 100 in the tests' normative samples. The standard deviations of these intelligence tests in the original normative samples are 15 or 16. It is thus evident that the range of variability in this sample is much closer to that of the original normative samples of each of the tests than are the mean IQ scores.

The intercorrelations of the VABS domains and the Adaptive Behavior Composite (ABC) were all significant, $p < .001$ (See Table 11). The correlations ranged from $r = .50$ to $r = .88$. The correlations among the MCDI scales and the General Development Index (GDI) ranged from $r = .38$ to $r = .95$ and were all significant, $p < .001$ (See Table 12). The correlations between the VABS domains and the MCDI scales were all significant, $p < .02$ or $p < .001$ (See Table 13). The correlations ranged from $r = .20$ to $r = .66$.

Table 10

Means and Standard Deviations of the Global Measures of Intelligence

	n	M	SD
SB72 IQ	16	64	15
SB4 Composite	63	80	14
Kaufman MPC	58	89	13
McCarthy GCI	2	68	9
WPPSI FSIQ	24	102	15

Table 11

Correlations Among the VABS Composite and Domains (n = 111)*

	ABC[1]	Communication	Daily Living Skills	Socialization
Communication	.83			
Daily Living Skills	.88	.66		
Socialization	.84	.68	.75	
Motor Skills (n = 107)	.82	.50	.62	.54

* $p < .001$.

[1] ABC = Adaptive Behavior Composite

Table 12

Correlations Within the MCDI (n = 111)

	GDI[1]	GM	FM	EL	CC	SC	SH
(GM) Gross Motor	.60						
(FM) Fine Motor	.79	.55					
(EL) Expressive Language	.91	.38	.59				
(CC) Comprehension Conceptual	.95	.45	.70	.91			
(SC) Situation Comprehension	.84	.56	.77	.71	.77		
(SH) Self Help	.81	.69	.71	.65	.67	.79	
(PS) Personal Social	.87	.53	.69	.80	.80	.86	.78

[1] GDI = General Development Index

* $p < .001$.

Table 13

Correlations Between the VABS and the MCDI[**] (n = 111)

MCDI	VABS ABC[1]	Communication	Daily Living Skills	Socialization	Motor Skills (n = 107)
General Development Index	.62	.59	.55	.55	.47
Gross Motor	.46	.20[*]	.43	.30	.62
Fine Motor	.50	.39	.41	.42	.48
Expressive Language	.53	.62	.45	.49	.30
Comprehension Conceptual	.59	.66	.47	.55	.38
Situation Comprehension	.52	.42	.51	.54	.39
Self Help	.55	.36	.63	.44	.48
Personal Social	.53	.45	.50	.56	.37

[1] ABC = Adaptive Behavior Composite

[*] $p < .02$. [**] $p < .001$.

<u>Canonical Correlation of the VABS and the MCDI</u>

Because of the missing data in the Motor Skills Domain for 4 subjects, the canonical correlation analysis was completed with a sample of 107 children. A summary of pertinent information about the canonical analyses can be found in Table 14. The multivariate *F* test of Wilks' $\text{Lambda}_{(1-4)}$ was significant, *F* (4, 1, 47) = 9.72, *p* < .0001, allowing for further investigation of the relationships between the VABS and the MCDI. The value of Wilks' $\text{Lambda}_{(1-4)}$ was .1244, therefore the value of eta^2 was .8756 indicating that 87.56 % of the variance in the total multivariate space was accounted for. The canonical analyses indicated that all four canonical dimensions were significant, Wilks' $\text{Lambda}_{(4-4)}$, *F*(4, 1, 47) = 6.6, *p* < .001. Because no hypotheses were generated a priori as to the significance and meaning of these multivariate relationships between the VABS domains and the MCDI scales, these results were not subject to further investigation in this study.

The redundancy indices indicated that 43.6 % of the variance in the VABS variables was predictable from or redundant with the MCDI variables and 39.88 % of the variance in the MCDI variables was predictable from or redundant with the VABS variables. The canonical loadings -

Table 14

Summary of the Canonical Correlation Analysis

	Canonical Dimensions			
	I	II	III	IV
Canonical R	.76	.68	.56	.46
Canonical R^2	.5777	.4599	.3093	.2105

Wilks' $Lambda_{(1 - 4)}$ = .1244, $p < .0001$

eta^2 = .8756

Percentage of Variance Accounted for = 87.56 %

Wilks' $Lambda_{(4 - 4)}$ = .7895, $p < .001$

	I	II	III	IV
Cumulative Proportion of Variance Accounted for in the VABS Domains by the MCDI Scales	.0655	.3861	.4175	.4360
VABS Redundancy Index				43.60 %
Cumulative Proportion of Variance Accounted for in the MCDI Scales by the VABS Domains	.0611	.3685	.3839	.3988
MCDI Redundancy Index				39.88 %

the simple correlation of each variable with its canonical variates - are listed in Tables 15 and 16.

Multiple Regression Analysis of Each VABS Domain

Each VABS domain was considered as a separate criterion variable in a multiple regression where the MCDI variables were the predictors. All possible subsets of MCDI variables as predictors were run, and the model that gave the highest percentage of variance accounted for (Adjusted R^2) was chosen. These analyses are summarized in Tables 17 through 20.

As can be seen from Table 17, 45 % of the variance of the Communication domain was accounted for by the Comprehension Conceptual scale and the Situation Comprehension scale. The contributions of both variables were significant. The best predictors of the Daily Living Skills Domain were the MCDI Fine Motor, Comprehension Conceptual and Self Help scales, accounting for 38.62 % of the variance in this domain. However, only the contribution of the Self Help scale was significant (See Table 18). Table 19 shows that 32.99 % of the variance of the Socialization domain was accounted for by the Personal Social scale and the Comprehension Conceptual scale. The Gross Motor, Fine Motor and Situation Comprehension scales of the MCDI account for 40.05 % of the variance of the VABS Motor Skills Domain. However, only the contributions of the

Table 15

Canonical Loadings of the VABS Domains

	Canonical Loadings on the VABS Variates			
VABS Domains	I	II	III	IV
Communication	-.5641	.8158	-.0031	-.1276
Daily Living Skills	.1510	.9422	.2989	.0116
Socialization	-.2236	.7780	.1204	.5747
Motor Skills	.2496	.7940	-.5492	.0749

Table 16

Canonical Loadings of the MCDI Scales

	Canonical Loadings on the MCDI Variates			
MCDI Scales	I	II	III	IV
Gross Motor	.4302	.7620	-.3975	.1224
Fine Motor	-.0755	.7552	-.2750	.1887
Expressive Language	-.4695	.8036	.1350	.0086
Comprehension Conceptual	-.4735	.8709	.0196	.1106
Situation Comprehension	-.0784	.8078	.1345	.4476
Self Help	.2896	.9117	.2223	.0374
Personal Social	-.1208	.7999	.1677	.4806

Table 17

Multiple Regression Analysis of the VABS Communication Domain (n = 111)

MCDI Predictors	Partial R^2	R^2	Adjusted R^2
Comprehension Conceptual	.4368	.4368, $p < .0001$	.4316
Situation Comprehension	.0234	.4602, $p < .03$	.4502

Table 18

Multiple Regression Analysis of the VABS Daily Living Skills Domain (n = 111)

MCDI Predictors	Partial R^2	R^2	Adjusted R^2
Fine Motor	.1697	.1697, $p < .28$	.1620
Comprehension Conceptual	.0657	.2354, $p < .19$	.2213
Self Help	.1675	.4029, $p < .0001$	.3862

Table 19

Multiple Regression Analysis of the VABS Socialization Domain ($n = 111$)

MCDI Predictors	Partial R^2	R^2	Adjusted R^2
Personal Social	.3137	.3137, $p < .0001$	.3074
Comprehension Conceptual	.0284	.3421, $p < .03$	.3299

Table 20

Multiple Regression Analysis of the VABS Motor Skills Domain ($n = 107$)

MCDI Predictors	Partial R^2	R^2	Adjusted R^2
Gross Motor	.3814	.3814, $p < .0001$	.3755
Fine Motor	.0302	.4116, $p < .02$	.4002
Situation Comprehension	.0059	.4175, $p < .31$	.4005

Gross Motor and Fine Motor scales were significant. The Situation Comprehension scale added to the value of adjusted R^2, however its contribution was quite small and not significant (See Table 20).

If one looks at all 4 regression analyses, it is evident that 6 of the 7 MCDI scales contribute to the prediction of 1 or more of the VABS domains. Only the Personal Social scale does not add to the value of adjusted R^2 for any of the domains.

The Relationship Between Adaptive Behaviour and Intelligence

The correlation of the composite measure from each intelligence test was correlated with the composite measures of the VABS and the MCDI (See Table 21). The correlations with the McCarthy General Cognitive Index (GCI) could not be calculated as only 2 children in the sample had this score in their file. The Composite Intelligence Estimate, based on one estimate of intelligence from each child in the sample to whom an intelligence test was administered, was correlated with the VABS Adaptive Behavior Composite (ABC) and with the MCDI General Development Index (GDI). The correlations ranged from r = .19 to r = .63. Neither the SB72 IQ nor the SB4 Composite were significantly correlated to the MCDI GDI. However, both of these measures were significantly correlated with the VABS ABC. The correlations of the Kaufman MPC and the WPPSI FSIQ with both

Table 21

Correlation of the Global Measures of Intelligence with the VABS Adaptive Behavior Composite (ABC) and the MCDI General Development Index (GDI)

	n	VABS ABC	MCDI GDI
SB72 IQ	16	.63**	.22
SB4 Composite	63	.42**	.19
Kaufman MPC	58	.58**	.51**
McCarthy GCI	2	-	-
WPPSI FSIQ	24	.47*	.50**
Composite Intelligence Estimate	97	.58**	.53**

* $p < .01$. ** $p < .005$

the VABS ABC and the MCDI GDI were significant and in the moderate range (.47 to .58). The Composite Intelligence Estimate yielded a significant and moderate correlation with both the VABS ABC and the MCDI GDI.

Discussion and Conclusions

The results of the analyses clearly support the proposed hypotheses. There is evidence of a substantial relationship between the MCDI and the VABS in this sample. Based on the information gathered in this sample, there is definitely reason to be more confident about considering the MCDI a measure of adaptive behaviour. In addition, there was a significant, moderate relationship between the VABS and the MCDI and most of the global measures of intelligence administered to this group of children. This suggested that, from a statistical point of view, both the VABS and the MCDI can be considered to be contributing to the measurement of adaptive behaviour.

As the descriptive analyses suggest, this sample of children cannot be considered a 'random, normal sample'. However one can consider the sample as having been drawn from a certain portion of a random normal distribution of children. In both adaptive competence and intelligence, these children are below the mean expected from the normative data (M = 100, See Tables 7 & 10). The variability in both adaptive competence and intellectual potential approximated that expected from the normative samples of these tests. This similarity in the range of variability suggests that this sample of children could have been drawn from similar populations to the ones originally sampled by these tests. However this sample of children, as they were primarily referred for developmental disabilities, was drawn from a lower portion of the distribution.

The intercorrelations between the VABS domains and the Adaptive Behavior Composite (ABC) suggested that each was strongly related to the ABC, $r = .82$ to $r = .88$. The intercorrelations among the VABS domains suggest that they are interrelated but that each domain still represents a distinct contribution to the understanding of adaptive behaviour. The Motor Skills Domain exhibited the lowest pattern of correlations with the other domains, $r = .50$ to $r = .62$.

All the MCDI scales except Gross Motor were highly correlated with the GDI (General Development Index), $r = .79$ to $r = .95$. The Gross Motor Scale correlated at only $r = .60$ with the GDI, and it consistently yielded the lowest correlations with all the other MCDI scales (See Table 12). It is possible that both the VABS Motor Skills Domain and the MCDI Gross Motor Scale may be tapping a source of variance that is somewhat more independent of other areas of adaptive functioning.

As stated in the review of the literature, the intercorrelations of the MCDI scales have often been quite high. This was found to be the case in this sample. Over 50 % of the correlations were of a magnitude greater than r

= .70. The majority of the correlations of the Personal Social Scale were greater than r = .78. These high intercorrelations suggest a substantial overlap in the content represented by each MCDI scale.

The simple correlations between the VABS and the MCDI were all positive and significant. Because the canonical correlation between the two tests was significant, the alpha level of these univariate correlations was protected. Thus one could safely interpret all univariate relationships between the VABS and the MCDI.

Overall in this sample the degree of relationship between the VABS and the MCDI was substantial. The variance in one test accounted for by the variables in the other test was substantial and quite balanced or symmetrical. The MCDI scales accounted for 43.6 % of the variance in the VABS domains whereas the VABS domains accounted for 39.88 % of the variance in the MCDI scales. Because the amount of variance in one test that is accounted for by the other is quite nearly symmetrical, one could likely give only one of the two tests and still account for a similar proportion of the information in this sample.

At the statistical level, there is some support for the idea that the MCDI can be considered as a measure of adaptive behaviour and also for the idea that the definition or conception of adaptive behaviour may agree between the

VABS and the MCDI. Support for these statements is seen in the magnitude of the overall relationship between the VABS and the MCDI (eta^2 = 87.56 %). The similarity of the two tests' conceptions of adaptive behaviour is also evident from which group of MCDI scales best predict each VABS domain in multiple regression analyses. For the most part, the MCDI scales that contribute to the proportion of variance accounted for in each VABS domain have obvious face validity in terms of their relationships. At the level of the simple correlations between the VABS domains and the MCDI scales (Table 13), the highest correlations are usually between the variables one might expect. For example the VABS Daily Living Skills Domain correlates most highly with the MCDI Self Help, Situation Comprehension and Personal Social Scales. Thus not only is there evidence from this sample that one can consider the MCDI as a measure of adaptive behaviour but also that one can perhaps consider the respective tests' conceptions of adaptive behaviour similar.

Returning to the multiple regression analyses, there were interesting groups of MCDI scales that accounted for the most variance in the VABS Daily Living Skills Domain and the Motor Skills Domain. The MCDI Fine Motor Scale along with the Comprehension Conceptual and Self Help Scales were the best group of predictors of the Daily Living Skills

Domain. The Fine Motor Scale might not seem as overtly related to what one thinks of as daily living skills as either the Comprehension Conceptual or Self Help Scales; however, upon inspection of the items included in this scale the reasons for this relationship become more evident. The Fine Motor items address discrete motor activities, however, many of them are tasks that if mastered, contribute to competence in daily living (e.g., Item 57: Picks up crumbs or bits of dry cereal, such as Rice Krispies or Cheerios, one at a time).

In prediction of the Motor Skills Domain, this overlap of item content within one MCDI scale also seems to exist. The Gross Motor, Fine Motor and Situation Comprehension scales contribute to prediction. It is the items of the Situation Comprehension Scale that seem to overlap in content between understanding social situations and the motor skills needed to act appropriately in those situations (e.g., Item 311: Climbs on chair, stool or box to reach things).

All of the MCDI scales except the Expressive Language Scale were variables that contributed to the prediction of the VABS domains in the multiple regression analyses. One possible explanation for this is that the Expressive Language Scale correlated $r = .91$ with the Comprehension Conceptual Scale. This was the single highest simple correlation between any of the MCDI scales. It is possible that the Comprehension Conceptual Scale is such a strong predictor variable because it overlaps so strongly with the Expressive Language Scale, encompassing much of the variance in it as well. The Comprehension Conceptual Scale contributed to the prediction of all of the VABS domains except the Motor Skills Domain. This suggests that there is something important in the content of the Comprehension Conceptual Scale that is related to a variety of areas of adaptive behaviour.

From a clinical perspective the MCDI was found to be a good general screening tool for the assessment of adaptive behaviour competence in this preschool sample. This is an important finding in that it provides potential justification for the transfer of initial screening and assessment resources from the somewhat time-consuming administration and scoring of the VABS to other pressing clinical demands. The MCDI could be routinely administered and if developmental delays were found in the scores, then adaptive behaviour could then be assessed more thoroughly.

Due to the degree of intercorrelation of the MCDI scales found in this sample, caution is advised in interpreting a score on a particular scale as representing a strength or weakness in the area it purports to assess. The Fine Motor Scale may not assess just fine motor ability; it may also contribute to the understanding of competence in daily living among other things. If one were going to use the profile of strengths and weaknesses of the MCDI to understand a childs' pattern of adaptive strengths and weaknesses, the individual items that contribute to the low or high scores should be investigated first and clinical judgements made as to the areas of adaptive competence the items address. An alternative approach is to administer the VABS when adaptive weaknesses are suspected based on the MCDI results. One would expect the overall adaptive level on the VABS to corroborate that found on the MCDI. In addition, the profile of strengths and weaknesses obtained from the VABS domains seems to contain less overlap in content within each domain.

The relationship between the VABS and the MCDI as measures of adaptive behaviour and a number of intelligence tests and a Composite Intelligence Estimate was also subject to investigation within this sample. As was stated in the review of the literature, one of the conventional, statistical indicators of whether a given measure of adaptive behaviour is indeed assessing adaptive behaviour is the degree of correlation that measure has with a test of intelligence. The literature leads one to expect a moderate correlation between a test of adaptive behaviour and a test of intelligence. This was the other major set of hypotheses tested in this study - that the global score from each intelligence test administered in this sample and a Composite Intelligence Estimate based on one global intelligence score for each child would relate only moderately to the VABS ABC and the MCDI GDI.

Both the VABS ABC and the MCDI GDI were moderately correlated with the Composite Intelligence Estimate, (n = 97) r = .58 and r = .53 respectively. Thus one can conclude that within this sample, adaptive behaviour as measured by the VABS and the MCDI is related only moderately to intelligence as defined by the composite of global scores from comparable tests of intelligence.

The VABS ABC correlated significantly with the global score from each of the intelligence tests. However the MCDI GDI was not significantly related to either the SB72 IQ or the SB4 Composite. The MCDI GDI was related to the Kaufman MPC and the WPPSI FSIQ. Overall though, the MCDI correlations were lower than the VABS correlations with these intelligence measures.

There is a possible explanation for this pattern of correlations that is based on the content area assessed by the tests involved. The degree to which each test focuses on assessment of language-related skills and abilities may be a key to understanding this situation. Two of the intelligence tests, the SB72 and to a lesser extent the SB4, are considered much more verbally oriented tests of intelligence (Anastasi, 1982; Krohn & Lamp, 1989). The VABS as well, has been described as being somewhat weighted on adaptive language skills (Evans & Bradley-Johnson, 1988). There is evidence that the MCDI is not assessing language skills as directly or thoroughly. Chaffee, Cunningham, Secord-Gilbert, Elbard & Richards (1990) reported only moderate correlations of the two supposed language scales of the MCDI with a criterion measure of linguistic competence, the Reynell Developmental Language Scales. In a sample of children referred to a communicative disorders clinic, the MCDI Expressive Language Scale correlated at $r = .50$ with the Reynell Expression Scale. The MCDI Comprehension Conceptual Scale correlated at $r = .52$ with the Reynell Comprehension Scale. One might expect that if the Expressive Language and Comprehension Conceptual scales were primarily assessing language skills that the correlations with expressive and receptive language criteria would be much greater. Perhaps the MCDI is not as heavily language-based as are the SB72, the SB4 and the VABS. If this were the case, this could account for the non-significant relationship of the MCDI to the more heavily language-oriented intelligence tests - the SB72 and the SB4. This explanation could therefore also account for the significant relationship of the more language-based VABS to these same intelligence tests.

This explanation also relates to the literature discussing operational definitions of adaptive behaviour. Adaptive behaviour measures that define adaptive behaviour in terms of behavioural competence and control rather than in terms of autonomy and responsibility may be more strongly related to tests of intellectual potential and competence (Roszkowski & Spreat, 1983). It would be interesting to test the hypothesis that the VABS, moreso than the MCDI, operationalizes adaptive behaviour in terms of behavioural competence and control.

There are a number of potential criticisms and weaknesses of this study that must be addressed in order to provide the most appropriate context for interpretation of the results obtained with this sample. The most important weakness to consider is that of the sample itself. This was a diverse sample of developmentally disabled preschool children. Information as to the specific physical and/or intellectual disability for which each child was referred was not considered. Without replication of these results, it would not be prudent to generalize these results to samples other than ones that resemble the characteristics of the present sample.

The diversity of disabilities in this sample however, may actually be a strength of the study. The magnitude and strength of the relationships found in this study suggest that they may be reliably replicated in a sample that is equally diverse in terms of disabilities or discretely limited to one or a few of the disabilities represented in this sample. However, without having documented the variety of disabilities in this sample, this question is unanswerable without further exploration.

Another potential source of variance that was not documented was the identity of the informant for the VABS and the MCDI. It is the author's impression that the majority of both questionnaires were completed by the child's mother or father. In a rare few cases, the foster parent or the child's child care worker provided the information. It would have been useful to have completed the same analyses in samples that had only one type of informant, i.e., the mother, as this could have affected the pattern of results. However, this would have reduced the number of subjects such that the probability of chance relationships would be increased.

Another criticism could be directed at the characteristics of the measures used in this study. The MCDI has been criticized for the magnitude of the intercorrelations between its scales. High intercorrelations between the MCDI scales were also obtained in this sample some of which seem to have affected the clarity of interpretation of the resulting relationships with the VABS. Certain sources have recommended factor analyzing the items of the MCDI in order to derive more independent scales within the test (Goodwin, 1978). To date a factor analysis of the MCDI has not been published. Perhaps a more in depth analysis of the structure within the MCDI should have been undertaken before it was related to the VABS.

No replication of the results obtained is reported that might serve to corroborate their reliability. Replication with a larger sample, and samples with different children, particularly a random, normal sample would be very helpful in increasing the generalizability of these results. This potential area of weakness also serves to guide future research directions.

Another very interesting and potentially promising direction for future investigation is the exploration of the multivariate relationships between the MCDI and the VABS. This study was concerned only with characterizing and understanding the dimensions of the VABS and the MCDI as they exist within each test. However, this study also suggested that there are multivariate relationships between the VABS and MCDI. These relationships consist of new, and why it has a variable relationship with intelligence and why different measures of adaptive behaviour relate differently to each other.

Perhaps a model to guide theory-building in adaptive behaviour lies in neuropsychology. Currently, the state of understanding of adaptive behaviour is based on the factors of the tests used to measure it. Perhaps the neuropsychological components or factors that affect adaptive behaviour should be investigated and defined. This would provide an inherent validity to the construct as any definition would be based on actual physical characteristics of people or brain-based areas of strength and weakness, i.e., motor coordination, language ability, facial perception, social perception and spatial ability. Presumably if the components of adaptive behaviour had an external base of validity, they would be more consistent in their relationships to other constructs - to the extent that all of these constructs considered a definable, circumscribed area of human behaviour.

This study attempted to refine the psychometric understanding of adaptive behaviour in two ways. It attempted to demonstrate that the MCDI could be considered a measure of adaptive behaviour in preschool children. Once this was established, the relationship between this test of adaptive behaviour and the VABS could be explored in order to determine whether these two tests of adaptive behaviour are related and whether they conceptualize the construct of adaptive behaviour in similar ways. The evidence in this sample suggests that the MCDI can be considered a measure of adaptive behaviour; the MCDI is related strongly to the VABS and the two tests seem to address the understanding of adaptive behaviour in similar ways.

With validation and replication, this information can become very useful to psychologists who practice with children. A choice is provided in terms of which adaptive behaviour measure to administer. This choice can be guided by the needs of the child, the purpose of the assessment and the demand for clinical resources. However, the other perspective from which to view this choice is that which states that this 'interchangeability' between the Minnesota Child Development Inventory and the Vineland Adaptive Behavior Scale in certain clinical circumstances serves to refine both the understanding and practice of psychological assessment in children.

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Appendix

Raw Data Used in the Analyses

CASE	SEX	AGE	BRTHYR	BRTHMTH	BRTHDAY
1	1	5.00	1984	9	4
2	2	5.10	1982	12	29
3	1	3.20	1985	4	29
4	2	4.10	1983	8	31
5	1	3.90	1983	12	24
6	1	3.00	1984	9	25
7	2	4.00	1983	12	17
8	2	2.10	1986	1	26
9	1	3.60	1985	6	25
10	2	3.80	1985	5	7
11	1	3.10	1986	3	13
12	2	2.10	1986	11	20
13	1	3.80	1986	2	21
14	1	4.00	1984	1	30
15	2	5.30	1984	3	30
16	1	4.70	1984	9	5
17	1	4.90	1983	3	20
18	2	4.60	1983	12	28
19	1	4.60	1983	10	3
20	1	4.10	1983	9	26
21	1	4.50	1984	6	4
22	1	4.40	1984	6	29
23	1	4.90	1984	1	14
24	2	4.90	1984	1	18
25	1	3.10	1984	12	10
26	1	4.10	1984	1	7
27	1	4.10	1984	1	22
28	1	3.60	1985	6	25
29	1	4.70	1984	9	12
30	1	3.80	1985	8	24
31	2	6.30	1983	3	7
32	1	5.90	1983	9	14
33	2	4.40	1985	6	22
34	2	4.40	1985	6	4
35	2	3.10	1986	1	26
36	2	4.04	1985	9	7
37	2	4.06	1985	5	16
38	1	4.03	1985	10	10
39	2	4.04	1985	10	23
40	1	4.08	1985	6	29
41	1	4.09	1985	5	30
42	1	4.04	1985	12	7
43	1	4.07	1985	10	14
44	1	4.40	1983	6	9
45	1	5.10	1983	2	8
46	1	4.50	1984	5	4
47	1	3.20	1985	7	11
48	1	3.20	1985	9	9
49	1	5.30	1984	1	28
50	1	3.60	1985	9	11

CASE	SEX	AGE	BRTHYR	BRTHMTH	BRTHDAY
51	2	4.40	1984	9	11
52	2	3.80	1985	6	18
53	1	3.10	1985	4	12
54	1	4.90	1984	9	8
55	2	4.60	1984	11	30
56	1	4.40	1985	2	17
57	2	4.10	1985	10	9
58	2	3.70	1985	3	21
59	2	6.20	1982	7	30
60	2	4.11	1985	1	15
61	1	4.04	1985	9	23
62	1	5.04	1984	12	29
63	2	4.00	1986	5	5
64	1	5.10	1984	6	28
65	2	4.40	1985	1	23
66	2	4.60	1983	4	12
67	1	4.40	1983	6	10
68	1	4.00	1983	9	21
69	1	4.00	1983	9	21
70	2	4.60	1983	5	12
71	1	3.90	1984	3	30
72	2	4.60	1983	8	10
73	1	4.10	1983	4	29
74	1	3.10	1984	5	16
75	1	5.20	1983	1	10
76	1	3.60	1984	9	21
77	1	5.40	1983	6	2
78	1	4.90	1984	1	14
79	2	4.20	1984	9	5
80	1	4.00	1984	9	24
81	1	5.90	1982	12	13
82	1	4.20	1984	8	24
83	1	4.70	1984	5	21
84	1	4.30	1984	12	21
85	1	4.50	1984	7	21
86	1	4.20	1984	12	30
87	2	4.00	1985	3	21
88	1	4.50	1985	3	3
89	1	4.50	1985	4	25
90	1	4.50	1985	5	16
91	2	5.30	1983	1	20
92	1	4.00	1985	10	27
93	2	5.03	1984	10	18
94	2	5.01	1984	12	28
95	1	4.07	1985	5	26
96	2	4.02	1985	10	28
97	2	4.07	1985	8	14
98	1	4.10	1983	1	21
99	1	1.07	1986	4	10
100	2	3.70	1985	2	10

CASE	SEX	AGE	BRTHYR	BRTHMTH	BRTHDAY
101	1	3.00	1985	11	13
102	1	4.10	1985	1	9
103	1	5.00	1984	9	22
104	2	4.50	1985	4	14
105	1	2.10	1986	12	23
106	1	4.08	1985	2	27
107	1	3.20	1986	9	27
108	2	3.05	1986	7	25
109	2	2.10	1987	3	5
110	1	4.07	1985	10	9
111	1	2.10	1987	3	24

CASE	VABSYR	VABSMTH	VABSDAY
1	1989	9	8
2	1988	2	23
3	1988	5	4
4	1987	10	26
5	1987	9	21
6	1987	10	5
7	1987	12	11
8	1988	12	7
9	1989	1	12
10	1989	1	11
11	1989	4	10
12	1989	9	20
13	1989	10	23
14	1988	1	13
15	1989	7	12
16	1989	3	9
17	1987	12	27
18	1988	1	26
19	1988	3	23
20	1988	9	12
21	1988	10	14
22	1988	10	7
23	1988	10	14
24	1988	10	27
25	1988	11	14
26	1988	11	28
27	1989	1	5
28	1989	1	10
29	1989	4	4
30	1989	5	8
31	1989	6	8
32	1989	6	22
33	1989	9	26
34	1989	10	2
35	1989	9	28
36	1989	12	11
37	1989	12	12
38	1990	1	15
39	1990	3	7
40	1990	3	26
41	1990	3	23
42	1990	5	3
43	1990	5	14
44	1987	9	25
45	1988	5	25
46	1988	9	9
47	1988	9	16
48	1988	12	2
49	1989	4	5
50	1989	2	24

CASE	VABSYR	VABSMTH	VABSDAY
51	1989	2	6
52	1989	2	9
53	1989	2	9
54	1989	6	2
55	1989	5	18
56	1989	6	29
57	1989	11	9
58	1989	11	20
59	1988	9	22
60	1989	12	7
61	1990	2	1
62	1990	4	27
63	1990	5	16
64	1990	5	23
65	1989	4	4
66	1987	10	14
67	1987	9	15
68	1987	10	5
69	1987	10	8
70	1987	11	16
71	1988	1	12
72	1988	1	27
73	1988	2	11
74	1988	3	7
75	1988	3	21
76	1988	4	12
77	1988	5	4
78	1988	9	29
79	1988	9	21
80	1988	9	30
81	1988	9	30
82	1988	11	2
83	1988	11	29
84	1989	3	3
85	1989	1	9
86	1989	3	6
87	1989	3	23
88	1989	7	10
89	1989	8	28
90	1989	9	22
91	1988	2	29
92	1989	11	20
93	1990	1	17
94	1990	2	6
95	1990	2	22
96	1990	1	24
97	1990	3	15
98	1987	11	10
99	1987	12	8
100	1988	9	27

CASE	VABSYR	VABSMTH	VABSDAY
101	1988	12	2
102	1989	9	14
103	1989	9	27
104	1989	9	5
105	1989	9	28
106	1989	11	1
107	1989	10	27
108	1990	1	9
109	1990	1	23
110	1990	3	1
111	1990	2	6

dos.

CASE	VABSCOMM	VABSDLS	VABSSOC	VABSMS	VABSABC
1	69	62	74	59	61
2	60	60	59	59	54
3	63	61	71	90	66
4	66	83	70	65	65
5	67	85	77	63	67
6	71	75	75	71	67
7	65	83	68	68	65
8	111	105	104	103	108
9	57	63	70	60	57
10	68	70	68	59	61
11	64	70	70	79	65
12	75	75	77	61	66
13	68	74	72	87	69
14	98	101	86	99	94
15	85	66	90	56	68
16	110	88	86	85	89
17	87	83	79	78	76
18	109	84	91	62	82
19	71	67	68	72	64
20	76	94	88	70	76
21	75	74	69	70	66
22	72	83	93	113	87
23	77	79	70	62	66
24	64	73	71	56	61
25	82	78	72	70	70
26	70	65	80	57	63
27	75	76	81	63	68
28	78	86	78	71	72
29	74	91	83	74	74
30	102	88	86	87	87
31	58	59	66	.	56
32	76	70	70	87	70
33	103	96	90	91	93
34	87	92	92	71	80
35	65	80	68	57	62
36	84	94	86	113	92
37	99	95	93	101	95
38	98	106	92	87	94
39	87	82	91	104	88
40	96	96	87	93	90
41	82	71	83	64	69
42	100	100	96	104	99
43	81	78	74	93	76
44	82	88	86	78	78
45	62	45	62	44	49
46	84	97	101	84	88
47	73	68	68	.	64
48	81	76	87	94	79
49	66	68	75	49	59
50	74	72	75	97	73

CASE	VABSCOMM	VABSDLS	VABSSOC	VABSMS	VABSABC
51	66	85	71	70	67
52	74	112	96	100	93
53	83	86	76	89	78
54	55	62	61	55	53
55	64	84	84	72	70
56	70	69	68	70	64
57	78	74	81	67	69
58	78	62	76	51	61
59	54	57	61	.	53
60	64	61	67	90	65
61	54	68	81	84	66
62	77	63	62	84	66
63	98	95	85	94	90
64	63	70	79	68	64
65	70	68	79	54	62
66	66	83	74	66	67
67	68	81	77	59	66
68	74	82	79	75	72
69	74	83	73	79	71
70	65	88	89	96	79
71	70	75	71	63	64
72	65	66	71	62	61
73	81	85	87	88	80
74	81	78	71	73	70
75	92	82	75	61	72
76	76	76	78	88	73
77	86	98	100	63	82
78	92	83	83	74	77
79	83	67	91	94	78
80	78	101	94	94	89
81	54	62	71	48	54
82	73	81	80	71	70
83	75	70	80	52	64
84	72	79	72	66	67
85	84	76	75	58	68
86	76	85	76	84	74
87	70	80	73	63	66
88	67	63	75	56	60
89	79	87	84	88	79
90	83	101	88	81	84
91	64	62	71	37	54
92	74	64	70	60	62
93	74	82	102	64	74
94	58	65	62	61	56
95	72	81	76	101	77
96	69	69	93	66	68
97	78	65	78	44	61
98	50	52	59	49	48
99	87	83	93	86	83
100	73	88	79	77	73

CASE	VABSCOMM	VABSDLS	VABSSOC	VABSMS	VABSABC
101	75	71	82	90	73
102	78	83	81	90	77
103	100	64	77	.	74
104	50	55	56	53	49
105	68	62	78	81	67
106	48	41	53	39	42
107	74	58	68	45	56
108	85	87	92	67	77
109	82	73	79	50	65
110	51	52	58	38	46
111	61	62	69	64	59

dos.

CASE	VRECEP	VEXPRES	VWRIT	VPERS	VDOMES	VCOMMUN
1	22	38	0	42	7	6
2	22	28	0	44	5	2
3	18	11	0	19	2	2
4	23	22	0	43	11	9
5	24	18	0	42	11	6
6	24	14	0	30	4	5
7	24	18	0	46	8	6
8	24	42	1	46	9	6
9	20	8	0	28	4	2
10	21	22	0	39	5	1
11	20	10	0	28	4	2
12	22	18	0	31	3	2
13	22	21	0	43	4	2
14	24	46	0	54	10	12
15	24	50	2	44	10	9
16	23	49	13	53	10	12
17	24	46	2	53	8	12
18	24	51	4	46	8	10
19	22	32	1	40	6	6
20	24	40	1	55	13	18
21	22	36	1	45	5	10
22	22	32	0	51	8	6
23	22	41	1	51	6	12
24	23	28	0	46	9	9
25	22	36	1	43	6	6
26	23	36	0	38	10	9
27	22	42	0	48	12	9
28	23	29	0	44	7	6
29	23	37	0	54	11	13
30	24	47	0	47	7	8
31	23	40	0	50	9	10
32	24	48	2	52	11	12
33	24	49	4	52	12	13
34	24	43	0	49	12	9
35	18	22	0	44	8	2
36	24	40	0	54	11	10
37	24	50	4	56	12	14
38	24	47	3	59	12	15
39	24	42	3	49	9	9
40	24	52	2	59	10	16
41	22	47	0	47	9	6
42	24	48	5	57	15	11
43	24	42	0	48	7	11
44	24	37	2	52	10	8
45	22	32	0	26	2	3
46	24	43	0	52	12	17
47	18	24	0	33	1	1
48	23	27	0	30	5	8
49	23	35	0	42	11	12
50	19	27	0	37	2	3

CASE	VRECEP	VEXPRES	VWRIT	VPERS	VDOMES	VCOMMUN
51	24	24	0	53	9	8
52	24	24	0	59	12	9
53	24	34	0	46	5	9
54	19	20	0	41	8	2
55	24	22	0	53	11	5
56	20	34	0	42	6	7
57	20	38	0	42	6	6
58	22	30	0	24	4	4
59	24	29	0	47	8	8
60	22	31	0	44	2	5
61	20	14	0	46	4	4
62	22	44	4	46	6	7
63	24	47	1	54	10	9
64	24	34	5	57	11	10
65	22	29	0	40	6	4
66	23	28	0	49	11	11
67	21	27	1	50	11	3
68	23	30	0	44	10	8
69	24	30	0	45	11	7
70	24	25	0	53	11	11
71	21	24	0	40	5	5
72	23	24	0	38	9	4
73	23	40	5	52	10	13
74	23	28	5	41	6	5
75	24	54	3	56	12	12
76	22	28	0	36	7	5
77	24	47	2	56	15	18
78	24	48	3	54	5	14
79	24	35	2	37	3	6
80	24	34	0	53	12	14
81	24	26	0	43	12	11
82	24	30	1	44	8	12
83	23	38	0	41	8	10
84	22	32	0	49	8	5
85	23	42	2	47	7	8
86	24	33	1	47	9	11
87	22	27	0	45	10	5
88	22	28	0	39	3	5
89	24	38	0	54	9	9
90	24	41	1	58	12	14
91	23	32	0	44	3	7
92	22	31	0	33	3	6
93	24	43	0	51	12	17
94	23	23	0	49	9	1
95	24	35	0	56	7	8
96	20	30	0	37	7	8
97	24	40	0	36	8	8
98	17	12	0	30	2	2
99	20	10	0	18	2	1
100	24	23	0	44	8	7

CASE	VRECEP	VEXPRES	VWRIT	VPERS	VDOMES	VCOMMUN
101	19	23	0	31	2	2
102	22	43	0	50	10	13
103	24	58	2	46	4	7
104	18	7	0	31	0	2
105	20	11	0	18	0	2
106	16	7	0	19	0	0
107	22	19	0	19	0	0
108	24	32	0	47	4	4
109	22	25	0	29	3	2
110	16	11	0	27	0	1
111	18	6	0	20	0	2

CASE	VINTREL	VPLALEI	VCOPE	VGROSS	VFINE
1	30	20	7	27	26
2	26	15	0	35	18
3	22	16	0	28	20
4	26	17	3	27	20
5	27	19	3	29	14
6	24	16	1	24	15
7	26	16	1	31	16
8	32	20	6	31	20
9	25	17	0	24	16
10	24	16	2	26	14
11	20	17	0	26	17
12	25	15	1	17	13
13	28	17	0	34	19
14	33	19	4	34	25
15	35	24	11	24	28
16	35	20	7	34	24
17	31	22	5	32	25
18	34	21	6	19	26
19	28	16	2	32	21
20	37	22	7	33	23
21	31	14	2	34	18
22	38	20	6	37	29
23	30	18	3	32	20
24	27	20	5	30	18
25	28	17	1	29	19
26	33	21	6	33	17
27	31	21	9	28	26
28	26	19	3	27	19
29	34	20	6	35	20
30	34	18	3	32	21
31	31	20	7	31	26
32	32	19	7	38	28
33	34	22	6	33	25
34	34	19	10	34	17
35	22	18	2	25	14
36	33	21	5	35	31
37	37	22	8	35	29
38	37	19	7	30	27
39	36	23	5	34	30
40	37	21	6	32	30
41	36	18	7	30	23
42	37	19	12	34	30
43	31	18	4	34	27
44	34	19	6	30	24
45	28	16	2	22	14
46	35	22	14	35	22
47	22	14	1	900	900
48	29	17	5	29	22
49	33	18	8	23	20
50	25	18	2	36	18

CASE	VINTREL	VPLALEI	VCOPE	VGROSS	VFINE
51	30	17	2	27	25
52	30	20	10	36	21
53	25	19	4	32	22
54	24	14	3	30	17
55	36	19	4	29	24
56	26	16	4	32	20
57	32	19	3	32	16
58	30	16	1	11	16
59	26	20	4	32	24
60	28	18	3	36	26
61	33	18	6	35	22
62	23	21	2	32	30
63	34	17	6	34	24
64	35	20	12	37	23
65	32	18	4	24	14
66	29	19	5	28	24
67	30	20	3	27	18
68	30	19	4	33	18
69	27	19	2	32	21
70	35	22	7	33	29
71	26	16	2	28	15
72	26	18	5	28	21
73	35	20	9	28	32
74	25	18	1	31	17
75	31	22	6	30	25
76	28	17	3	32	20
77	40	21	14	30	24
78	36	19	6	27	29
79	35	17	9	32	26
80	36	19	8	32	26
81	33	20	6	27	19
82	32	18	5	32	19
83	34	20	4	25	14
84	30	16	3	29	20
85	27	20	6	29	17
86	28	19	5	34	22
87	27	19	2	23	23
88	29	18	6	28	15
89	33	19	7	34	24
90	35	20	7	34	22
91	32	16	6	8	22
92	29	16	1	28	15
93	41	22	16	35	21
94	26	16	2	30	24
95	32	18	6	37	28
96	37	18	9	30	19
97	31	21	4	10	21
98	23	15	1	23	14
99	23	12	0	17	8
100	28	19	2	29	19

CASE	VINTREL	VPLALEI	VCOPE	VGROSS	VFINE
101	29	17	0	28	20
102	34	17	9	38	23
103	34	18	7	900	900
104	20	13	0	24	14
105	25	15	0	25	14
106	18	12	0	16	13
107	24	12	0	7	8
108	33	18	5	26	16
109	26	14	2	10	8
110	23	13	0	15	11
111	20	15	0	18	14

CASE	MCDIYR	MCDIMTH	MCDIDAY	MCDIGD
1	1989	9	20	95
2	1988	2	23	83
3	1988	5	8	54
4	1987	10	26	73
5	1987	10	14	67
6	1987	10	23	60
7	1988	3	11	66
8	1989	1	3	95
9	1989	1	18	40
10	1989	1	22	72
11	1989	4	10	49
12	1989	10	20	66
13	1989	10	23	70
14	1987	11	25	94
15	1989	7	16	122
16	1989	3	23	117
17	1988	1	13	109
18	1988	1	30	108
19	1988	4	7	87
20	1988	9	22	106
21	1989	7	24	102
22	1988	11	3	107
23	1988	10	19	96
24	1988	11	18	105
25	1988	11	15	83
26	1988	12	1	78
27	1989	1	6	106
28	1989	1	10	82
29	1989	4	12	106
30	1989	5	17	105
31	1989	6	8	110
32	1989	6	28	114
33	1989	9	27	109
34	1989	10	1	106
35	1989	11	21	73
36	1990	1	22	121
37	1989	12	19	125
38	1990	1	15	114
39	1990	3	11	119
40	1990	3	28	117
41	1990	3	22	106
42	1990	5	7	121
43	1990	5	16	96
44	1987	10	20	103
45	1988	6	18	88
46	1988	11	4	101
47	1988	10	5	82
48	1988	12	9	86
49	1989	4	7	92
50	1989	3	16	76

CASE	MCDIYR	MCDIMTH	MCDIDAY	MCDIGD
51	1989	2	7	84
52	1989	3	10	112
53	1989	4	12	100
54	1989	6	2	78
55	1989	5	24	80
56	1989	7	12	84
57	1989	11	9	84
58	1989	11	22	53
59	1988	9	29	86
60	1989	12	6	97
61	1990	1	30	77
62	1990	5	2	115
63	1990	5	17	103
64	1990	5	15	105
65	1989	4	17	79
66	1987	10	19	93
67	1987	9	17	85
68	1987	10	5	91
69	1987	10	7	85
70	1987	11	23	104
71	1988	1	14	81
72	1988	1	29	82
73	1988	2	21	115
74	1988	3	7	85
75	1988	4	4	118
76	1988	4	12	79
77	1988	5	10	108
78	1988	11	10	123
79	1988	10	7	98
80	1988	10	20	107
81	1988	10	3	83
82	1988	11	3	96
83	1989	1	21	100
84	1989	3	6	83
85	1989	1	10	98
86	1989	3	7	81
87	1989	4	3	82
88	1989	7	11	66
89	1989	9	5	106
90	1989	10	26	108
91	1988	3	15	75
92	1989	11	7	83
93	1990	2	21	110
94	1990	2	9	76
95	1990	1	23	94
96	1990	3	12	93
97	1990	3	28	88
98	1987	12	1	51
99	1987	12	27	46
100	1988	10	26	76

CASE	MCDIYR	MCDIMTH	MCDIDAY	MCDIGD
101	1988	12	2	78
102	1989	11	24	108
103	1989	8	31	100
104	1989	9	19	40
105	1989	11	5	62
106	1990	1	9	26
107	1989	10	27	66
108	1990	1	9	71
109	1990	1	23	51
110	1990	5	10	41
111	1990	2	5	58

CASE	MCDIGM	MCDIFM	MCDIEL	MCDICC	MCDISC	MCDISH	MCDIPS
1	28	35	45	37	30	25	26
2	29	33	44	29	25	30	22
3	26	26	27	13	21	18	20
4	24	35	34	26	36	26	27
5	24	31	31	18	23	27	23
6	20	28	30	21	26	19	13
7	28	32	27	21	32	28	25
8	28	32	47	40	34	25	26
9	23	26	19	10	21	17	11
10	21	29	38	21	26	27	25
11	28	28	23	13	20	14	15
12	20	29	37	23	24	20	24
13	31	31	34	20	27	24	20
14	29	31	44	36	24	24	23
15	27	43	53	60	42	27	33
16	31	41	49	60	36	34	30
17	31	33	54	55	37	31	29
18	20	37	54	54	38	27	31
19	28	33	45	31	27	22	28
20	30	32	53	50	35	30	32
21	29	33	57	42	31	31	28
22	30	39	49	46	35	32	30
23	25	27	48	45	27	24	24
24	26	34	51	50	36	27	30
25	27	31	43	35	29	25	20
26	26	28	45	34	30	13	26
27	30	44	47	37	32	30	30
28	27	33	40	27	25	25	22
29	30	32	53	48	30	33	32
30	30	31	53	49	34	28	30
31	31	37	52	49	39	33	32
32	31	37	54	52	35	33	32
33	32	37	53	49	39	34	31
34	29	36	50	49	39	32	31
35	23	29	34	19	26	28	24
36	31	42	50	53	39	34	32
37	32	42	54	59	39	35	34
38	27	38	54	52	34	33	30
39	29	41	50	51	38	31	31
40	29	40	54	57	33	35	30
41	26	33	51	53	34	25	29
42	28	43	54	61	35	35	30
43	29	32	48	37	29	26	25
44	30	37	48	45	36	33	31
45	18	32	45	42	30	21	26
46	29	34	48	45	34	31	33
47	27	33	39	24	31	23	26
48	29	36	44	34	33	23	29
49	23	30	50	35	31	29	28
50	27	28	41	29	25	22	22

CASE	MCDIGM	MCDIFM	MCDIEL	MCDICC	MCDISC	MCDISH	MCDIPS
51	26	33	39	25	35	34	26
52	32	39	48	45	41	35	33
53	27	35	50	40	36	29	28
54	29	31	36	26	31	30	28
55	30	33	39	26	33	33	27
56	27	34	42	32	33	27	26
57	29	28	40	40	29	20	24
58	11	26	37	23	19	12	20
59	30	34	41	32	28	23	21
60	28	38	39	41	36	27	30
61	29	36	29	26	31	29	20
62	30	43	52	55	35	24	24
63	25	31	49	41	30	29	26
64	31	38	43	43	33	30	26
65	19	27	44	35	27	19	26
66	27	35	39	34	34	29	27
67	29	35	39	32	32	26	25
68	29	32	46	36	34	29	26
69	27	32	40	36	33	27	24
70	30	36	43	39	40	32	31
71	27	29	38	28	24	23	21
72	29	31	40	25	34	26	28
73	25	42	52	54	35	33	32
74	26	32	40	39	27	18	16
75	27	39	52	59	36	35	30
76	27	31	41	26	27	20	23
77	27	33	51	52	37	32	33
78	31	44	54	58	38	34	30
79	28	37	47	46	36	24	32
80	28	37	48	49	36	32	32
81	27	32	35	32	28	26	25
82	29	31	48	38	32	26	27
83	28	31	50	50	30	23	31
84	29	32	43	24	32	29	25
85	24	33	50	45	35	27	28
86	30	32	40	29	25	25	20
87	25	34	38	25	27	26	22
88	21	24	36	24	23	19	16
89	30	34	50	43	30	28	24
90	28	34	50	47	36	34	32
91	15	35	46	27	31	18	22
92	26	31	44	38	23	16	21
93	30	34	53	50	39	34	32
94	24	33	34	24	26	26	20
95	28	35	45	34	30	33	27
96	28	33	45	34	36	27	30
97	12	33	49	43	35	19	26
98	19	25	30	10	18	14	16
99	18	27	23	14	20	12	13
100	24	31	35	29	33	24	26

CASE	MCDIGM	MCDIFM	MCDIEL	MCDICC	MCDISC	MCDISH	MCDIPS
101	29	32	38	26	27	23	22
102	32	33	46	47	33	34	29
103	27	28	52	55	28	27	28
104	25	28	18	9	22	16	11
105	27	35	30	22	26	17	23
106	17	23	17	5	16	8	10
107	11	25	46	31	22	14	16
108	24	30	35	25	29	23	19
109	11	27	35	20	17	9	18
110	17	24	25	10	17	15	13
111	22	31	23	20	24	18	24

CASE	SB72	SBCOMP	KMPC	MCGC	FSIQ	TIQESTIM
1	.	.	.	61	.	38.08
2	37	.	.	.	.	24.40
3	58	.	.	.	.	36.37
4	68	67	.	.	.	42.07
5	64	74	.	.	.	39.79
6	76	.	.	.	.	46.63
7	46	.	.	.	.	29.53
8	91	.	.	.	.	55.18
9	63	.	.	.	.	39.22
10	53	.	.	.	.	33.52
11	68	.	.	.	.	42.07
12	64	.	.	.	.	39.79
13	45	.	.	.	.	28.96
14	.	.	86	.	96	52.33
15	.	.	102	.	107	61.45
16	.	.	108	.	111	64.87
17	.	.	114	.	130	68.30
18	.	.	95	.	97	57.46
19	.	77	76	.	78	46.63
20	.	86	90	.	.	54.61
21	.	.	84	.	104	51.19
22	.	.	93	.	.	56.32
23	.	88	78	.	.	47.77
24	.	.	88	.	.	53.47
25	63	.	76	.	.	46.63
26	.	.	89	.	.	54.04
27	.	97	88	.	105	53.47
28	94	.	102	.	.	61.45
29	.	.	96	.	95	58.03
30	.	.	106	.	.	63.73
31	.	.	75	.	76	46.06
32	.	.	108	.	106	64.87
33	.	90	83	.	.	50.62
34	.	.	85	.	83	51.76
35	.	87	83	.	.	50.62
36	.	.	109	.	112	65.44
37	.	.	116	.	114	69.44
38	.	.	118	.	122	70.58
39	.	.	119	.	117	71.15
40	.	.	89	.	120	54.04
41	.	83	81	.	.	49.48
42	.	.	112	.	112	67.16
43	.	.	86	.	.	52.33
44	.	72	.	.	.	44.35
45	.	58	.	.	.	36.37
46	.	82	.	.	.	50.05
47	.	101	.	.	.	60.88
48	.	86	.	.	.	52.33
49	.	55	.	.	.	34.66
50	.	91	.	.	.	55.18

CASE	SB72	SBCOMP	KMPC	MCGC	FSIQ	TIQESTIM
51	.	67	.	.	.	41.50
52	.	87	.	.	.	53.47
53	.	79	.	.	.	48.34
54	.	110	.	.	.	66.01
55	.	59	.	.	.	36.94
56	.	59	.	.	.	36.94
57	.	73	.	.	.	44.92
58	.	77	.	.	.	47.20
59	.	55	.	.	.	34.66
60	.	65	.	.	.	40.36
61	.	73	.	.	.	44.92
62	.	78	.	.	.	47.77
63	.	101	.	.	.	60.88
64	.	54	.	.	.	34.09
65	.	83	.	.	96	50.62
66	.	72	69	74	.	44.35
67	71	72	86	.	.	44.35
68	.	96	88	.	.	58.03
69	.	92	85	.	.	55.75
70	.	84	80	.	.	51.19
71	.	103	100	.	.	62.02
72	.	69	.	.	.	42.64
73	.	90	101	.	104	54.61
74	.	101	95	.	.	60.88
75	.	97	82	.	97	58.60
76	.	96	95	.	.	58.03
77	.	78	78	.	80	47.77
78	.	94	.	.	106	56.89
79	.	76	80	.	.	46.63
80	.	97	89	.	.	58.60
81	.	58	.	.	.	36.37
82	.	105	95	.	.	62.59
83	.	75	86	.	.	46.06
84	.	94	90	.	.	56.89
85	.	86	88	.	.	52.33
86	.	87	82	.	.	52.90
87	.	84	84	.	.	51.19
88	.	71	80	.	.	43.78
89	.	87	80	.	.	52.90
90	.	83	.	.	84	50.62
91	59	65	63	.	.	40.36
92	.	70	79	.	.	43.21
93	.	62	68	.	.	38.65
94	.	67	65	.	.	41.50
95	.	89	87	.	.	54.04
96	.	73	75	.	.	44.92
97	.	78	81	.	.	47.77
98	.	.	.	.	.	.
99	.	.	.	.	.	.
100	.	.	.	.	.	.

CASE	SB72	SBCOMP	KMPC	MCGC	FSIQ	TIQESTIM
101	.	.	.	.	.	.
102	.	.	.	.	.	.
103	.	.	.	.	.	.
104	.	.	.	.	.	.
105	.	.	.	.	.	.
106	.	.	.	.	.	.
107	.	.	.	.	.	.
108	.	.	.	.	.	.
109	.	.	.	.	.	.
110	.	.	.	.	.	.
111	.	.	.	.	.	.

CASE	SBVOCAB	SBCOMPR	SBABSRD	SBVR	SBPTNAN	SBCOPY	SBAVR
1	36	42	0	76	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	30	39	41	70	41	37	75
5	35	42	0	75	40	35	71
6	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
11	41	0	0	0	0	0	0
12	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0
18	56	0	0	0	0	0	0
19	44	41	0	84	46	0	92
20	47	47	52	97	45	0	90
21	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0
23	47	46	54	98	0	0	0
24	0	0	0	0	0	0	0
25	46	0	0	0	0	0	0
26	44	38	0	0	0	0	0
27	57	50	0	108	48	0	96
28	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
31	44	41	42	83	0	0	0
32	0	0	0	0	0	0	0
33	48	49	43	92	0	49	98
34	0	0	0	0	0	0	0
35	41	45	0	85	49	47	95
36	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
41	47	43	43	87	46	0	92
42	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0
44	40	45	41	82	38	35	69
45	43	35	34	71	39	33	68
46	37	0	0	0	41	0	82
47	52	44	0	96	52	50	102
48	50	42	0	91	43	40	80
49	34	34	0	65	0	29	58
50	53	49	0	102	43	42	83

CASE	SBVOCAB	SBCOMPR	SBABSRD	SBVR	SBPTNAN	SBCOPY	SBAVR
51	34	33	37	65	44	35	76
52	43	44	38	81	46	47	92
53	43	40	38	78	46	43	87
54	31	31	0	58	28	30	52
55	32	37	35	65	32	35	62
56	33	33	0	63	38	38	72
57	46	43	41	85	38	41	76
58	40	44	37	78	33	37	66
59	35	31	34	62	29	31	54
60	39	36	32	67	36	39	71
61	35	33	37	66	41	43	82
62	46	40	46	86	36	38	70
63	39	52	48	92	54	44	98
64	38	33	29	62	33	33	61
65	50	50	42	95	38	41	76
66	44	43	41	83	44	35	76
67	38	37	37	71	41	41	79
68	44	49	47	92	54	46	106
69	42	45	47	88	49	41	89
70	42	45	45	86	51	43	93
71	38	42	46	82	64	47	113
72	34	33	37	64	44	38	79
73	54	52	48	103	46	41	85
74	45	40	38	81	54	55	110
75	46	52	52	100	45	42	85
76	53	44	50	98	54	46	100
77	49	50	36	89	43	37	77
78	51	48	54	102	39	53	91
79	52	39	34	81	49	33	79
80	50	47	51	98	49	46	94
81	35	35	30	62	0	33	66
82	48	50	50	98	49	54	103
83	43	50	48	93	36	34	66
84	50	41	45	89	52	54	107
85	48	48	49	96	41	38	76
86	50	41	43	88	46	46	91
87	48	45	46	92	43	46	87
88	37	41	39	75	41	41	79
89	44	47	48	92	49	43	91
90	44	41	37	79	51	41	91
91	47	37	33	75	39	29	63
92	42	37	41	77	38	33	67
93	35	48	34	75	34	28	56
94	36	37	34	67	43	38	78
95	51	50	58	107	46	51	97
96	38	39	42	77	41	38	76
97	39	43	40	79	43	34	74
98	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

CASE	SBVOCAB	SBCOMPR	SBABSRD	SBVR	SBPTNAN	SBCOPY	SBAVR
101	56	44	0	100	43	40	81
102	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0

CASE	SBQUANT	SBQR	SBBEAD	SBSENT	SBSTM
1	0	0	39	39	74
2	0	0	0	0	0
3	0	0	0	0	0
4	38	76	35	0	70
5	43	86	40	0	80
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	39	78	40	34	70
20	47	94	41	33	71
21	0	0	0	0	0
22	0	0	0	0	0
23	45	90	39	46	82
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	43	34	0
27	0	0	47	44	89
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0
31	0	0	0	0	0
32	0	0	0	0	0
33	47	94	43	43	84
34	0	0	0	0	0
35	0	0	46	42	86
36	0	0	0	0	0
37	0	0	0	0	0
38	0	0	0	0	0
39	0	0	0	0	0
40	0	0	0	0	0
41	45	90	31	48	75
42	0	0	0	0	0
43	0	0	0	0	0
44	42	84	40	35	71
45	29	58	32	35	61
46	44	88	42	0	84
47	0	0	52	0	104
48	0	0	47	0	94
49	32	64	0	32	64
50	42	84	53	47	100

CASE	SBQUANT	SBQR	SBBEAD	SBSENT	SBSTM
51	42	84	42	29	66
52	49	98	46	41	85
53	40	80	50	36	84
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	35	30	59
57	38	76	41	35	72
58	49	98	39	45	81
59	37	74	0	29	58
60	43	86	37	28	59
61	44	88	47	30	73
62	44	88	38	47	82
63	55	110	48	55	104
64	32	64	36	29	59
65	44	88	40	47	85
66	42	84	35	34	64
67	44	88	38	35	68
68	53	106	52	38	88
69	51	102	54	40	93
70	52	104	38	30	63
71	57	114	59	41	100
72	39	78	38	76	38
73	50	100	47	34	78
74	52	104	58	48	107
75	56	112	41	54	94
76	49	98	51	41	91
77	43	86	41	38	75
78	45	90	43	54	96
79	41	82	43	37	77
80	53	106	52	42	93
81	37	74	29	0	58
82	57	114	59	42	101
83	43	86	39	38	73
84	49	98	43	45	86
85	52	104	40	40	77
86	49	98	41	40	78
87	44	88	43	38	78
88	39	78	32	42	70
89	44	88	42	45	85
90	47	94	42	40	79
91	39	78	33	39	67
92	38	76	45	38	80
93	40	80	38	30	63
94	39	78	41	29	65
95	40	80	50	31	78
96	36	72	45	43	86
97	47	94	43	38	78
98	0	0	0	0	0
99	0	0	0	0	0
100	0	0	0	0	0

CASE	SBQUANT	SBQR	SBBEAD	SBSENT	SBSTM
101	0	0	0	41	0
102	0	0	0	0	0
103	0	0	0	0	0
104	0	0	0	0	0
105	0	0	0	0	0
106	0	0	0	0	0
107	0	0	0	0	0
108	0	0	0	0	0
109	0	0	0	0	0
110	0	0	0	0	0
111	0	0	0	0	0

CASE	KMW	KFR	KHM	KGC	KNR
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	5	7	8	8	11
15	0	0	10	13	10
16	11	9	9	13	11
17	12	10	12	11	11
18	10	10	7	9	11
19	7	10	5	8	4
20	6	11	9	12	5
21	9	9	5	8	9
22	12	12	7	11	7
23	7	7	7	5	9
24	9	11	6	9	8
25	7	6	6	7	7
26	9	6	7	9	10
27	10	8	6	12	8
28	8	12	10	11	11
29	10	12	9	4	11
30	10	11	7	17	9
31	0	0	5	8	8
32	0	0	8	12	10
33	8	6	7	9	7
34	9	9	9	7	8
35	9	10	6	6	8
36	10	16	8	12	9
37	10	11	9	15	12
38	10	14	9	12	18
39	10	9	14	17	14
40	9	6	5	11	11
41	5	9	7	4	9
42	11	13	9	14	11
43	7	6	12	9	7
44	8	0	0	0	0
45	0	0	0	0	0
46	1	7	0	7	0
47	0	0	0	0	0
48	0	0	0	0	0
49	0	0	0	0	0
50	14	14	0	0	0

CASE	KMW	KFR	KHM	KGC	KNR
51	3	3	4	4	0
52	7	14	8	0	0
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	0	0	0
57	0	0	0	0	0
58	0	0	0	0	0
59	0	0	5	1	0
60	0	0	0	0	0
61	0	7	8	0	3
62	0	0	0	0	0
63	0	0	0	0	0
64	0	0	0	0	0
65	0	0	0	0	0
66	3	8	4	3	6
67	6	10	6	12	8
68	11	9	10	5	7
69	9	9	8	5	8
70	8	4	8	9	6
71	7	12	12	10	9
72	3	2	4	3	1
73	9	11	9	15	8
74	12	8	4	12	11
75	0	0	7	8	12
76	11	13	6	10	7
77	9	11	6	4	5
78	0	0	0	0	0
79	9	10	6	6	5
80	12	9	9	6	10
81	0	0	0	0	0
82	11	11	10	9	8
83	7	6	8	11	10
84	8	9	12	7	7
85	8	8	6	10	10
86	7	6	6	7	9
87	9	9	6	7	8
88	5	5	6	10	11
89	6	8	7	5	8
90	0	0	0	0	0
91	0	0	3	5	4
92	5	9	5	10	6
93	0	10	4	6	4
94	5	4	6	2	2
95	9	12	5	11	4
96	5	4	7	4	9
97	6	11	5	9	8
98	0	0	0	0	0
99	0	0	0	0	0
100	0	0	0	0	0

CASE	KMW	KFR	KHM	KGC	KNR
101	0	0	0	0	0
102	0	0	0	0	0
103	0	0	0	0	0
104	0	0	0	0	0
105	0	0	0	0	0
106	0	0	0	0	0
107	0	0	0	0	0
108	0	0	0	0	0
109	0	0	0	0	0
110	0	0	0	0	0
111	0	0	0	0	0

CASE	KTRI	KWO	KMA	KSM	KPS
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	9	9	0	0	0
15	9	11	12	8	0
16	13	12	0	0	0
17	16	11	0	0	0
18	8	11	0	0	0
19	6	7	0	0	0
20	8	10	0	0	0
21	8	7	0	0	0
22	7	8	0	0	0
23	6	8	0	0	0
24	8	8	0	0	0
25	0	0	0	0	0
26	9	10	0	0	0
27	10	5	0	0	0
28	0	0	0	0	0
29	11	0	0	0	0
30	0	0	0	0	0
31	5	6	12	3	5
32	12	11	12	13	0
33	9	8	0	0	0
34	8	6	0	0	0
35	0	0	0	0	0
36	14	10	0	0	0
37	12	16	0	0	0
38	11	12	0	0	0
39	11	12	0	0	0
40	11	7	0	0	0
41	8	10	0	0	0
42	10	13	0	0	0
43	9	7	0	0	0
44	0	0	0	0	0
45	0	0	0	0	0
46	0	0	0	0	0
47	0	0	0	0	0
48	0	0	0	0	0
49	0	0	0	0	0
50	0	0	0	0	0

CASE	KTRI	KWO	KMA	KSM	KPS
51	0	0	0	0	0
52	0	0	0	0	0
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	0	0	0
57	0	0	0	0	0
58	0	0	0	0	0
59	5	0	0	0	0
60	0	0	0	0	0
61	7	5	0	0	0
62	0	0	0	0	0
63	0	0	0	0	0
64	0	0	0	0	0
65	0	0	0	0	0
66	8	7	0	0	0
67	10	5	0	0	0
68	10	7	0	0	0
69	9	8	0	0	0
70	9	7	0	0	0
71	0	0	0	0	0
72	8	5	0	0	0
73	12	8	0	0	0
74	0	0	0	0	0
75	5	6	10	5	0
76	0	0	0	0	0
77	7	7	0	0	0
78	0	0	0	0	0
79	7	8	0	0	0
80	7	7	0	0	0
81	0	0	0	0	0
82	10	7	0	0	0
83	8	7	0	0	0
84	12	6	0	0	0
85	10	7	0	0	0
86	10	8	0	0	0
87	9	7	0	0	0
88	8	6	0	0	0
89	10	7	0	0	0
90	0	0	0	0	0
91	6	6	5	4	0
92	9	6	0	0	0
93	6	6	8	4	0
94	8	5	6	5	0
95	10	7	0	0	0
96	8	9	0	0	0
97	6	7	0	0	0
98	0	0	0	0	0
99	0	0	0	0	0
100	0	0	0	0	0

CASE	KTRI	KWO	KMA	KSM	KPS
101	0	0	0	0	0
102	0	0	0	0	0
103	0	0	0	0	0
104	0	0	0	0	0
105	0	0	0	0	0
106	0	0	0	0	0
107	0	0	0	0	0
108	0	0	0	0	0
109	0	0	0	0	0
110	0	0	0	0	0
111	0	0	0	0	0

CASE	KEV	KFP	KARITH	KRID	KRD
1	0	0	0	0	0
2	66	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	95	109	0	0	0
15	0	97	90	103	97
16	114	112	110	95	0
17	112	105	117	110	0
18	101	86	101	111	0
19	81	84	70	87	0
20	114	94	76	112	0
21	101	86	101	89	0
22	103	74	93	86	0
23	105	75	76	0	0
24	86	76	92	97	0
25	88	91	85	0	0
26	105	75	79	95	0
27	0	0	79	0	0
28	92	79	80	100	0
29	0	0	0	0	0
30	114	111	114	107	0
31	0	86	60	101	61
32	0	0	0	0	0
33	103	93	89	90	0
34	91	92	79	97	0
35	0	0	0	0	0
36	83	86	101	0	93
37	89	106	114	11	120
38	107	93	104	119	0
39	91	108	105	93	0
40	112	109	95	119	0
41	101	87	76	74	0
42	110	103	113	111	0
43	99	84	80	91	0
44	0	0	0	0	0
45	0	0	0	0	0
46	87	0	0	0	0
47	0	0	0	0	0
48	0	0	0	0	0
49	0	0	0	0	0
50	0	0	0	0	0

CASE	KEV	KFP	KARITH	KRID	KRD
51	65	0	0	0	0
52	0	0	0	0	0
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	0	0	0
57	0	0	0	0	0
58	0	0	0	0	0
59	0	61	60	0	0
60	0	0	0	0	0
61	70	73	72	74	0
62	0	0	0	0	0
63	0	0	0	0	0
64	0	0	0	0	0
65	0	0	0	0	0
66	67	78	80	73	0
67	75	79	72	74	0
68	79	89	87	84	0
69	88	89	83	80	0
70	94	71	77	103	0
71	86	78	129	79	0
72	66	78	70	73	0
73	97	105	92	97	0
74	91	91	111	82	0
75	0	79	101	103	104
76	92	87	95	81	0
77	89	94	93	99	0
78	0	0	0	0	0
79	86	81	85	0	0
80	116	95	83	84	0
81	0	64	72	66	87
82	82	89	83	76	0
83	89	84	84	103	0
84	80	93	89	75	0
85	96	97	86	85	0
86	103	74	93	79	0
87	79	76	79	92	0
88	83	86	75	81	0
89	83	92	82	97	0
90	0	0	0	0	0
91	0	67	62	69	0
92	85	83	76	76	0
93	82	67	68	91	84
94	68	74	64	70	89
95	112	88	81	82	0
96	96	79	86	74	0
97	74	78	80	87	0
98	0	0	0	0	0
99	0	0	0	0	0
100	0	0	0	0	0

CASE	KEV	KFP	KARITH	KRID	KRD
101	0	0	0	0	0
102	0	0	0	0	0
103	0	0	0	0	0
104	0	0	0	0	0
105	0	0	0	0	0
106	0	0	0	0	0
107	0	0	0	0	0
108	0	0	0	0	0
109	0	0	0	0	0
110	0	0	0	0	0
111	0	0	0	0	0

CASE	KSEQ	KSIM	KACH	KNONV
1	0	0	.	0
2	0	0	.	0
3	0	0	.	0
4	0	0	.	0
5	0	0	.	0
6	0	0	.	0
7	0	0	.	0
8	0	0	.	0
9	0	0	.	0
10	0	0	.	0
11	0	0	.	0
12	0	0	.	0
13	0	0	.	0
14	95	81	.	86
15	102	103	96	98
16	104	110	109	102
17	108	116	113	119
18	98	94	99	88
19	72	84	78	80
20	87	94	98	95
21	81	89	93	82
22	83	103	87	91
23	87	75	.	78
24	83	94	85	88
25	79	78	.	0
26	93	88	86	82
27	78	100	.	86
28	103	102	85	0
29	100	94	.	104
30	87	119	113	0
31	78	77	74	74
32	98	116	.	108
33	83	86	92	82
34	85	88	88	91
35	81	88	.	0
36	93	121	81	119
37	115	114	106	0
38	119	112	106	109
39	122	112	99	0
40	85	94	110	82
41	91	77	82	86
42	106	114	111	104
43	91	84	86	93
44	0	0	.	0
45	0	0	.	0
46	0	0	.	0
47	0	0	.	0
48	0	0	.	0
49	0	0	.	0
50	0	0	.	0

CASE	KSEQ	KSIM	KACH	KNONV
51	0	0	.	0
52	0	0	.	0
53	0	0	.	0
54	0	0	.	0
55	0	0	.	0
56	0	0	.	0
57	0	0	.	0
58	0	0	.	0
59	0	0	.	0
60	0	0	.	0
61	72	0	68	82
62	0	0	.	0
63	0	0	.	0
64	0	0	.	0
65	0	0	.	0
66	74	71	71	78
67	78	96	72	91
68	87	91	82	92
69	87	86	83	91
70	81	83	84	80
71	103	97	91	0
72	0	61	67	0
73	89	112	97	104
74	84	104	92	0
75	89	80	96	78
76	79	109	87	0
77	76	84	92	86
78	0	0	.	0
79	78	86	.	0
80	91	89	93	88
81	0	0	68	0
82	89	101	80	102
83	89	86	88	82
84	89	93	82	106
85	85	93	89	86
86	85	83	85	82
87	81	89	79	86
88	85	80	79	76
89	83	81	86	88
90	0	0	.	0
91	64	68	.	65
92	74	88	77	84
93	69	74	75	71
94	66	69	71	75
95	72	103	89	93
96	89	69	81	76
97	80	86	77	82
98	0	0	.	0
99	0	0	.	0
100	0	0	.	0

CASE	KSEQ	KSIM	KACH	KNONV
101	0	0	.	0
102	0	0	.	0
103	0	0	.	0
104	0	0	.	0
105	0	0	.	0
106	0	0	.	0
107	0	0	.	0
108	0	0	.	0
109	0	0	.	0
110	0	0	.	0
111	0	0	.	0

CASE	MCV	MCPP	MCQ	MCMEM	MCBB
1	24	39	33	31	6
2	0	0	0	0	0
3	0	0	0	0	0
4	0	31	0	0	5
5	0	0	0	0	0
6	0	45	0	0	5
7	0	0	0	0	0
8	0	0	0	0	0
9	0	32	0	0	4
10	0	32	0	0	5
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	44	0	0	8
16	0	62	0	0	10
17	0	0	0	0	0
18	0	46	0	0	8
19	0	30	0	0	6
20	0	33	0	0	7
21	0	47	0	0	9
22	0	49	0	0	10
23	0	0	0	0	0
24	0	50	0	0	7
25	0	0	0	0	0
26	0	35	0	0	8
27	0	41	0	0	10
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0
31	0	36	0	0	9
32	0	0	0	0	0
33	0	43	0	0	10
34	0	0	0	0	0
35	0	0	0	0	0
36	0	62	0	0	0
37	0	0	0	0	0
38	0	0	0	0	0
39	0	0	0	0	0
40	0	0	0	0	0
41	0	0	0	0	0
42	0	0	0	0	0
43	0	0	0	0	0
44	0	0	0	0	0
45	0	0	0	0	0
46	0	36	0	0	8
47	0	48	0	0	9
48	0	38	0	0	4
49	0	0	0	0	0
50	0	46	0	0	8

CASE	MCV	MCPP	MCQ	MCMEM	MCBB
51	0	25	0	0	6
52	0	45	0	0	7
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	0	0	0
57	0	0	0	0	0
58	0	0	0	0	0
59	0	34	0	0	7
60	0	0	0	0	0
61	0	0	0	0	0
62	0	0	0	0	0
63	0	0	0	0	0
64	0	0	0	0	0
65	0	43	0	0	6
66	32	39	35	32	4
67	0	0	0	0	0
68	0	0	0	0	0
69	0	35	0	0	5
70	0	45	0	0	8
71	0	37	0	0	5
72	0	22	0	0	5
73	0	0	0	0	0
74	0	41	0	0	6
75	0	0	0	0	0
76	0	44	0	0	7
77	0	0	0	0	0
78	0	0	0	0	0
79	0	36	0	0	8
80	0	0	0	0	0
81	0	0	0	0	0
82	0	43	0	0	6
83	0	0	0	0	0
84	0	39	0	0	6
85	0	0	0	0	0
86	0	55	0	0	10
87	0	45	0	0	9
88	0	30	0	0	7
89	0	41	0	0	9
90	0	0	0	0	0
91	0	0	0	0	0
92	0	0	0	0	0
93	0	0	0	0	0
94	0	0	0	0	0
95	0	0	0	0	0
96	0	0	0	0	0
97	0	0	0	0	0
98	0	0	0	0	0
99	0	0	0	0	0
100	0	0	0	0	0

CASE	MCV	MCPP	MCQ	MCMEM	MCBB
101	0	29	0	0	3
102	0	0	0	0	8
103	0	0	0	0	0
104	0	0	0	0	0
105	0	0	0	0	0
106	0	0	0	0	0
107	0	0	0	0	0
108	0	0	0	0	0
109	0	0	0	0	0
110	0	0	0	0	0
111	0	0	0	0	0

CASE	MCPS	MCPM	MCWK	MCNQ	MCTS
1	5	3	9	4	1
2	0	0	0	0	0
3	0	0	0	0	0
4	2	0	6	0	1
5	0	0	0	0	0
6	1	0	0	0	1
7	0	0	0	0	0
8	0	0	0	0	0
9	1	0	0	0	1
10	0	0	0	0	1
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	5	0	0	10	5
16	7	0	0	8	2
17	0	0	0	0	0
18	1	0	0	0	2
19	2	0	0	0	1
20	2	2	9	12	4
21	2	0	0	0	2
22	6	0	0	0	1
23	0	0	0	0	0
24	3	0	0	0	2
25	0	0	0	0	0
26	3	0	9	0	1
27	4	0	0	0	2
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0
31	4	5	16	6	2
32	0	0	0	0	0
33	1	0	0	4	1
34	0	0	0	0	0
35	0	0	0	0	0
36	0	0	0	0	0
37	0	0	0	0	0
38	0	0	0	0	0
39	0	0	0	0	0
40	0	0	0	0	0
41	0	0	0	0	0
42	0	0	0	0	0
43	0	0	0	0	0
44	0	0	0	0	0
45	0	0	0	0	0
46	2	0	0	0	1
47	4	0	0	0	1
48	0	0	0	0	2
49	0	0	0	0	0
50	2	0	0	0	4

CASE	MCPS	MCPM	MCWK	MCNQ	MCTS
51	3	0	0	0	1
52	1	0	0	0	2
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	0	0	0
57	0	0	0	0	0
58	0	0	0	0	0
59	2	0	0	0	1
60	0	0	0	0	0
61	0	0	0	0	0
62	0	0	0	0	0
63	0	0	0	0	0
64	0	0	0	0	0
65	2	0	0	6	1
66	3	2	8	6	3
67	0	0	0	0	0
68	0	0	0	0	0
69	3	0	0	0	1
70	3	0	9	6	3
71	2	0	0	0	1
72	1	0	0	0	1
73	0	0	0	0	0
74	2	0	0	4	2
75	0	0	0	0	0
76	1	0	9	2	1
77	0	0	0	0	0
78	0	0	0	0	0
79	3	0	0	0	1
80	0	0	0	0	0
81	0	0	0	0	0
82	7	5	0	6	2
83	0	0	0	0	0
84	5	0	0	0	2
85	0	0	0	0	0
86	5	0	0	0	3
87	3	0	0	4	1
88	0	0	0	0	1
89	3	0	0	8	2
90	0	0	0	0	0
91	0	0	0	0	0
92	0	0	0	0	0
93	0	0	0	0	0
94	0	0	0	0	0
95	0	0	0	0	0
96	0	0	0	0	0
97	0	0	0	0	0
98	0	0	0	0	0
99	0	0	0	0	0
100	0	0	0	0	0

CASE	MCPS	MCPM	MCWK	MCNQ	MCTS
101	0	0	6	0	0
102	8	0	9	0	1
103	0	0	0	0	0
104	0	0	0	0	0
105	0	0	0	0	0
106	0	0	0	0	0
107	0	0	0	0	0
108	0	0	0	0	0
109	0	0	0	0	0
110	0	0	0	0	0
111	0	0	0	0	0

CASE	MCVMI	MCVMII	MCRLO	MCDD	MCDC
1	5	1	5	4	10
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	2	0
5	0	0	0	0	0
6	0	0	0	1	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	1	0
10	0	0	0	1	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	2	6	9
16	0	0	0	11	3
17	0	0	0	0	0
18	0	0	0	3	6
19	0	0	0	2	0
20	0	0	0	3	5
21	0	0	0	4	6
22	0	0	0	6	4
23	0	0	0	0	0
24	0	0	0	2	7
25	0	0	0	0	0
26	0	0	0	3	4
27	0	0	0	4	12
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0
31	0	0	9	3	9
32	0	0	0	0	0
33	0	0	0	4	5
34	0	0	0	0	0
35	0	0	0	0	0
36	0	0	0	0	0
37	0	0	0	0	0
38	0	0	0	0	0
39	0	0	0	0	0
40	0	0	0	0	0
41	0	0	0	0	0
42	0	0	0	0	0
43	0	0	0	0	0
44	0	0	0	0	0
45	0	0	0	0	0
46	0	0	0	1	3
47	0	0	0	2	0
48	0	0	0	2	0
49	0	0	0	0	0
50	0	0	0	1	0

CASE	MCVMI	MCVMII	MCRLO	MCDD	MCDC
51	0	0	0	1	0
52	0	0	0	4	0
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	0	0	0
57	0	0	0	0	0
58	0	0	0	0	0
59	0	0	0	3	0
60	0	0	0	0	0
61	0	0	0	0	0
62	0	0	0	0	0
63	0	0	0	0	0
64	0	0	0	0	0
65	0	0	0	3	4
66	4	0	0	2	4
67	0	0	0	0	0
68	0	0	0	0	0
69	0	0	0	3	3
70	0	0	0	3	6
71	0	0	0	3	1
72	0	0	0	2	0
73	0	0	0	0	0
74	0	0	0	4	0
75	0	0	0	0	0
76	0	0	0	3	1
77	0	0	0	0	0
78	0	0	0	0	0
79	0	0	0	1	1
80	0	0	0	0	0
81	0	0	0	0	0
82	0	0	0	2	2
83	0	0	0	0	0
84	0	0	0	2	3
85	0	0	0	0	0
86	0	0	0	3	6
87	0	0	0	3	5
88	7	0	0	2	0
89	0	0	0	3	2
90	0	0	0	0	0
91	0	0	0	0	0
92	0	0	0	0	0
93	0	0	0	0	0
94	0	0	0	0	0
95	0	0	0	0	0
96	0	0	0	0	0
97	0	0	0	0	0
98	0	0	0	0	0
99	0	0	0	0	0
100	0	0	0	0	0

CASE	MCVMI	MCVMII	MCRLO	MCDD	MCDC
101	0	0	0	0	0
102	0	0	0	0	0
103	0	0	0	0	0
104	0	0	0	0	0
105	0	0	0	0	0
106	0	0	0	0	0
107	0	0	0	0	0
108	0	0	0	0	0
109	0	0	0	0	0
110	0	0	0	0	0
111	0	0	0	0	0

CASE	MCNMI	MCNMII	MCVF	MCCS	MCDA	MCCG
1	4	0	4	5	0	5
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	4
5	0	0	0	0	0	0
6	0	0	0	0	0	2
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	1
10	0	0	0	0	0	1
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	8
16	0	0	0	0	4	4
17	0	0	0	0	0	0
18	0	0	0	0	0	4
19	0	0	0	0	2	4
20	0	0	0	0	0	7
21	0	0	0	0	0	8
22	0	0	0	0	0	3
23	0	0	0	0	0	0
24	0	0	0	0	0	10
25	0	0	0	0	0	0
26	0	0	0	0	4	4
27	0	0	0	0	0	5
28	0	0	0	0	0	0
29	0	0	0	0	0	0
30	0	0	0	0	0	0
31	0	0	0	0	0	8
32	0	0	0	0	0	0
33	0	0	0	0	4	3
34	0	0	0	0	0	0
35	0	0	0	0	0	0
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	0	0
42	0	0	0	0	0	0
43	0	0	0	0	0	0
44	0	0	0	0	0	0
45	0	0	0	0	0	0
46	0	0	0	0	0	3
47	0	0	0	0	0	0
48	0	0	0	0	0	1
49	0	0	0	0	0	0
50	0	0	0	0	0	2

CASE	MCNMI	MCNMII	MCVF	MCCS	MCDA	MCCG
51	0	0	0	0	0	0
52	0	0	0	0	0	5
53	0	0	0	0	0	0
54	0	0	0	0	0	0
55	0	0	0	0	0	0
56	0	0	0	0	0	0
57	0	0	0	0	0	0
58	0	0	0	0	0	0
59	0	0	0	0	0	6
60	0	0	0	0	0	0
61	0	0	0	0	0	0
62	0	0	0	0	0	0
63	0	0	0	0	0	0
64	0	0	0	0	0	0
65	0	0	0	0	0	8
66	2	0	6	3	4	7
67	0	0	0	0	0	0
68	0	0	0	0	0	0
69	0	0	0	0	0	1
70	0	0	0	0	0	6
71	0	0	0	0	0	2
72	0	0	0	0	0	1
73	0	0	0	0	0	0
74	0	0	0	2	0	3
75	0	0	0	0	0	0
76	0	0	0	0	0	2
77	0	0	0	0	0	0
78	0	0	0	0	0	0
79	0	0	0	0	0	3
80	0	0	0	0	0	0
81	0	0	0	0	0	0
82	0	0	0	0	0	5
83	0	0	0	0	0	0
84	0	0	0	0	0	2
85	0	0	0	0	0	0
86	0	0	0	0	0	8
87	0	0	0	0	0	2
88	0	0	0	0	0	5
89	0	0	0	0	0	6
90	0	0	0	0	0	0
91	0	0	0	0	0	0
92	0	0	0	0	0	0
93	0	0	0	0	0	0
94	0	0	0	0	0	0
95	0	0	0	0	0	0
96	0	0	0	0	0	0
97	0	0	0	0	0	0
98	0	0	0	0	0	0
99	0	0	0	0	0	0
100	0	0	0	0	0	0

CASE	MCNMI	MCNMII	MCVF	MCCS	MCDA	MCCG
101	0	0	0	0	0	0
102	0	0	0	0	0	0
103	0	0	0	0	0	0
104	0	0	0	0	0	0
105	0	0	0	0	0	0
106	0	0	0	0	0	0
107	0	0	0	0	0	0
108	0	0	0	0	0	0
109	0	0	0	0	0	0
110	0	0	0	0	0	0
111	0	0	0	0	0	0

CASE	WPPSIINF	WPPSIVOC	WPPSIARI	WPPSISIM
1	5	0	7	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	12	9	10	8
15	11	10	9	11
16	11	8	11	12
17	17	15	13	14
18	10	8	10	12
19	7	7	4	9
20	0	0	0	0
21	13	9	9	13
22	10	0	9	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	15	12	11	10
28	0	0	0	0
29	8	8	10	16
30	0	0	0	0
31	7	0	6	9
32	9	14	11	10
33	0	0	0	0
34	9	6	6	10
35	0	0	0	0
36	11	8	11	12
37	13	8	11	11
38	15	14	14	15
39	10	8	12	13
40	13	13	14	16
41	0	0	0	0
42	14	11	11	12
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	8	0	9	6
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0

CASE	WPPSIINF	WPPSIVOC	WPPSIARI	WPPSISIM
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0
60	0	0	0	0
61	0	0	0	0
62	0	0	0	0
63	0	0	0	0
64	0	0	0	0
65	11	11	11	14
66	0	0	0	0
67	0	0	0	0
68	0	0	0	0
69	0	0	0	0
70	0	0	0	4
71	0	0	0	0
72	0	0	0	0
73	13	7	10	12
74	0	0	0	0
75	10	9	11	10
76	0	0	0	0
77	9	9	10	12
78	9	8	10	6
79	0	0	0	0
80	0	0	0	0
81	0	0	0	0
82	0	0	0	0
83	0	0	0	0
84	0	0	0	0
85	0	0	0	0
86	0	0	0	0
87	0	0	0	0
88	0	0	0	0
89	0	0	0	0
90	9	3	8	7
91	0	0	0	0
92	0	0	0	0
93	0	0	0	0
94	0	0	0	0
95	0	0	0	0
96	0	0	0	0
97	0	0	0	0
98	0	0	0	0
99	0	0	0	0
100	0	0	0	0

CASE	WPPSIINF	WPPSIVOC	WPPSIARI	WPPSISIM
101	0	0	0	0
102	7	0	0	0
103	15	12	0	18
104	0	0	0	0
105	0	0	0	0
106	0	0	0	0
107	0	0	0	0
108	0	0	0	0
109	0	0	0	0
110	0	0	0	0
111	0	0	0	0

CASE	WPPSICOM	WPPSISEN	WPPSIANH	WPPSIPIC	WPPSIMAZ
1	0	0	9	11	12
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	9	10	11	9	10
15	13	10	10	12	12
16	8	9	13	12	15
17	12	0	14	18	13
18	12	10	11	10	7
19	5	0	9	8	7
20	0	0	0	0	0
21	10	7	9	10	10
22	0	0	14	15	12
23	0	0	0	0	0
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	9	8	0	11	9
28	0	0	0	0	0
29	0	0	10	12	3
30	0	0	0	0	0
31	5	0	6	9	6
32	13	12	7	11	11
33	0	0	0	0	0
34	8	7	9	10	5
35	0	0	0	0	0
36	10	3	14	12	10
37	10	11	17	11	11
38	13	12	11	13	12
39	10	0	13	14	15
40	12	11	12	14	12
41	0	0	0	0	0
42	15	8	6	12	11
43	0	0	0	0	0
44	0	0	0	0	0
45	0	0	0	0	0
46	0	0	6	9	5
47	0	0	0	0	0
48	0	0	0	0	0
49	0	0	0	0	0
50	0	0	0	0	0

CASE	WPPSICOM	WPPSISEN	WPPSIANH	WPPSIPIC	WPPSIMAZ
51	0	0	0	0	0
52	0	0	0	0	0
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	0	0	0
57	0	0	0	0	0
58	0	0	0	0	0
59	0	0	0	0	0
60	0	0	0	0	0
61	0	0	0	0	0
62	0	0	0	0	0
63	0	0	0	0	0
64	0	0	0	0	0
65	12	10	7	12	3
66	0	0	0	0	0
67	0	0	0	0	0
68	0	0	0	0	0
69	0	0	0	0	0
70	0	0	0	0	0
71	0	0	0	0	0
72	0	0	0	0	0
73	11	3	9	12	10
74	0	0	0	0	0
75	11	15	9	12	9
76	0	0	0	0	0
77	6	3	8	7	7
78	11	0	12	14	14
79	0	0	0	0	0
80	0	0	0	0	0
81	0	0	0	0	0
82	0	0	0	0	0
83	0	0	0	0	0
84	0	0	0	0	0
85	0	0	0	0	0
86	0	0	0	0	0
87	0	0	0	0	0
88	0	0	0	0	0
89	0	0	0	0	0
90	8	0	6	11	6
91	0	0	0	0	0
92	0	0	0	0	0
93	0	0	0	0	0
94	0	0	0	0	0
95	0	0	0	0	0
96	0	0	0	0	0
97	0	0	0	0	0
98	0	0	0	0	0
99	0	0	0	0	0
100	0	0	0	0	0

CASE	WPPSICOM	WPPSISEN	WPPSIANH	WPPSIPIC	WPPSIMAZ
101	0	0	0	0	0
102	0	0	7	7	0
103	11	0	0	0	0
104	0	0	0	0	0
105	0	0	0	0	0
106	0	0	0	0	0
107	0	0	0	0	0
108	0	0	0	0	0
109	0	0	0	0	0
110	0	0	0	0	0
111	0	0	0	0	0

CASE	WPPSIGED	WPPSIBLD	WPPSIAHR	VIQ	PIQ
1	8	8	0	0	97
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	9	7	0	97	95
15	8	14	0	105	108
16	14	11	12	100	119
17	11	15	0	126	129
18	7	9	0	102	92
19	5	9	0	77	84
20	0	0	0	0	0
21	13	10	0	105	103
22	14	12	0	0	123
23	0	0	0	0	0
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	10	10	0	109	100
28	0	0	0	0	0
29	7	0	0	104	86
30	0	0	0	0	0
31	4	7	0	80	76
32	11	11	0	109	101
33	0	0	0	0	0
34	5	8	0	86	82
35	0	0	0	0	0
36	13	16	0	102	120
37	16	11	0	104	122
38	10	14	0	126	114
39	14	15	0	104	129
40	13	9	0	122	114
41	0	0	0	0	0
42	13	12	6	116	105
43	0	0	0	0	0
44	0	0	0	0	0
45	0	0	0	0	0
46	7	4	0	0	74
47	0	0	0	0	0
48	0	0	0	0	0
49	0	0	0	0	0
50	0	0	0	0	0

CASE	WPPSIGED	WPPSIBLD	WPPSIAHR	VIQ	PIQ
51	0	0	0	0	0
52	0	0	0	0	0
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	0	0	0
57	0	0	0	0	0
58	0	0	0	0	0
59	0	0	0	0	0
60	0	0	0	0	0
61	0	0	0	0	0
62	0	0	0	0	0
63	0	0	0	0	0
64	0	0	0	0	0
65	5	8	0	111	80
66	0	0	0	0	0
67	0	0	0	0	0
68	0	0	0	0	0
69	0	0	0	0	0
70	0	0	0	0	0
71	0	0	0	0	0
72	0	0	0	0	0
73	11	11	8	104	104
74	0	0	0	0	0
75	8	7	0	101	93
76	0	0	0	0	0
77	2	8	0	87	76
78	10	14	0	92	119
79	0	0	0	0	0
80	0	0	0	0	0
81	0	0	0	0	0
82	0	0	0	0	0
83	0	0	0	0	0
84	0	0	0	0	0
85	0	0	0	0	0
86	0	0	0	0	0
87	0	0	0	0	0
88	0	0	0	0	0
89	0	0	0	0	0
90	9	10	0	81	89
91	0	0	0	0	0
92	0	0	0	0	0
93	0	0	0	0	0
94	0	0	0	0	0
95	0	0	0	0	0
96	0	0	0	0	0
97	0	0	0	0	0
98	0	0	0	0	0
99	0	0	0	0	0
100	0	0	0	0	0

CASE	WPPSIGED	WPPSIBLD	WPPSIAHR	VIQ	PIQ
101	0	0	0	0	0
102	0	0	0	0	0
103	0	0	0	125	0
104	0	0	0	0	0
105	0	0	0	0	0
106	0	0	0	0	0
107	0	0	0	0	0
108	0	0	0	0	0
109	0	0	0	0	0
110	0	0	0	0	0
111	0	0	0	0	0

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2 August 1990
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