A follow-up comparison of trainable mentally retarded children who attend integrated or segregated school placements.

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A FOLLOW-UP COMPARISON OF TRAINABLE MENTALLY RETARDED CHILDREN WHO ATTEND INTEGRATED OR SEGREGATED SCHOOL PLACEMENTS

by

Helen Elaine Martin

A Thesis submitted to the Faculty of Graduate Studies and Research through the Department of Psychology in Partial Fulfillment of the requirements for the Degree of Master of Arts at the University of Windsor

Windsor, Ontario, Canada

1984
ABSTRACT

The present study was a follow-up to an earlier investigation (Orr, 1983) involving 28 primary school-age trainable mentally retarded children attending either integrated or segregated school placements. The children in the segregated group attended a school designed exclusively for trainable children while the integrated group attended satellite classrooms of the special school which were housed in a regular suburban school.

In 1982 the children in both groups were tested on the following measures: Wechsler Intelligence Scale for Children - Revised (WISC-R), Wide Range Achievement Test (WRAT), Peabody Picture Vocabulary Test - Revised (PPVT-R), Quick Neurological Screening Test, and the Adaptive Behaviour Scale (ABS). In June, 1984, sixteen children, seven in the integrated group and nine in the segregated group, who continued to be in attendance at their 1982 placement were reassessed on all the measures employed in 1982 with the exception of the Quick Neurological Screening Test.

Examination of pre-posttest score changes (i.e., improvement) indicated that, for the most part, children in both integrated and segregated settings improved their scores between the first and second testings. In terms of reading,
spelling and arithmetic (i.e., WRAT) scores one group did not improve significantly more than did the other. On one Verbal measure, PPVT-R, the children in the segregated setting improved more than did the integrated children. However, on the Comprehension subtests of the WISC-R and ABS the children in the integrated setting improved more than the children in the segregated setting improved. There was also greater improvement by the integrated group on the sums of the WISC-R Verbal subtest raw scores. Analyses of ABS scores indicated that the segregated children improved more on the Responsibility subdomain than the integrated children improved.

In summary, the integrated placement, which was established on an experimental basis, did not appear to be detrimental to the children. In fact, the most salient finding of the study was the improvement of the integrated group over the segregated group in comprehension scores. Thus, it was concluded that the integrated setting enhanced the social adaptive behaviour of these children.
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CHAPTER I
INTRODUCTION

The issue of providing education to the trainable mentally retarded, (i.e., intellectual functioning between 25 and 50 on standardized intelligence tests) has received a great deal of attention. Determining responsibility for the education of these children has been a difficult problem and subject of much debate (Goldberg, 1957; Dunn, 1963; Hambleton & Ziegler, 1974). Prior to the formal assignment of this responsibility, some school boards provided programmes for trainable mentally retarded children; others were cared for in their homes or in institutions. Largely through the efforts of the human rights movement and parent associations legislation was passed which clearly assigns the responsibility for education to public school boards (e.g., United States Public Law 94-142 passed in 1975 and Bill 82, an amendment to the Ontario Education Act, passed in 1980 to be fully implemented in 1985).

As a result of the above, school boards have been faced with the challenge of providing appropriate programming to trainable mentally retarded children. A long-standing programming concern that has taken on recent salience involves the issue of whether these children's needs are best met in an integrated setting or a segregated setting (Hambleton & Ziegler, 1974). In 1981, an experimental programme was set
up in a large Canadian city to study this matter. Children ranging in age from 5 years 8 months to 11 years 4 months from primary classes in a school designed to meet the needs of the trainable mentally retarded were divided into two groups, 14 children in each group. One group remained at this school (segregated setting), while the other was placed in a satellite classroom in a regular school (integrated setting). The decision as to which school placement a child would attend was made by school board personnel based on criteria that they had established. Baseline data were obtained by a school board psychometrist on both groups of children about eight months after the children had begun attending the integrated setting. The following test measures were employed: Wechsler Intelligence Scale for Children - Revised (WISC-R), Wide Range Achievement Test (WRAT), Peabody Picture Vocabulary Test Revised (PPVT-R), Adaptive Behavior Scale (ABS), and Quick Neurological Screening Test. These were incorporated into a report by Orr (1983).

The purpose of the present study was to follow up this initial investigation. The children were reassessed on the WISC-R, WRAT, PPVT-R, and ABS with a view to examining changes in performance in relation to their school placement. In other words, this was a follow-up study assessing changes in children's performance by comparing scores on data gathered in 1982 and 1984 in both settings.
In order to put the present study into a broader context, it is important to address several topics in the discussion to follow. First and foremost is that of defining the terms because some of them (e.g., integration) have been used rather loosely in the literature. The second is to discuss the rationales that have been presented for both integration and segregation. The third is to review research on the performance of trainable mentally retarded children in various educational settings.

**Definition of Terms**

The meaning of some of the terms in this area of research changes from study to study. For example, what might constitute an integrated setting in one study may be called a segregated setting by the authors of another study. The following is a brief outline of how the terms "mental retardation", "trainable mental retardation", "integration," and "segregation" have been used in the past and will be used in this study.

**Mental Retardation**. According to Klein, Pasch, and Frey (1979) the classification of individuals as mentally retarded has its origins in the medical profession. Physicians used the term mental deficiency to refer to a condition having a physiological etiology which resulted in lowered mental functioning. The use implied a static condition and the individuals were not thought capable of any real development.
In addition to physicians other professionals with differing backgrounds such as education and psychology are now dealing with the mentally retarded. These different groups have coined words/definitions to suit their particular field. To add to the confusion, many words after being associated with the retarded, have taken on negative connotations (e.g., moron, idiot, imbecile); subsequently, they have lost the precise meaning originally ascribed to them.

Current definitions are not predicated on either etiology or prognosis, but rather focus on levels of functioning. A widely used definition is that which is accepted by the American Association of Mental Deficiency (AAMD). It is as follows: "Mental Retardation refers to significantly subaverage general intellectual functioning existing concurrently with impairments in adaptive behavior and manifested during the developmental period" (Grossman, 1973 p. 5).

Subaverage intellectual functioning is defined as performance two standard deviations below the mean on a standardized test such as the Wechsler Intelligence Scale for Children-Revised (WISC-R). An individual cannot be termed retarded, however, on the basis of an IQ score alone, but must also exhibit adaptive behaviour deficits.

Thus, apart from the above criteria (i.e., subaverage intellectual functioning accompanied by maladaptive behaviour), mentally retarded children may be vastly
different from each other in areas such as social, emotional, and language development. Studies comparing the performance of groups of retarded children are useful, however, caution must be exercised in generalizing the results to other groups of retarded children because mentally retarded individuals constitute a very heterogeneous group.

**Trainable Mental Retardation.** Classification systems have been developed to subdivide the mentally retarded into groups according to functioning levels. The AAMD cites the following classifications: Borderline, IQ 70-84; Mild, IQ 55-69; Moderate, IQ 40-54; Severe, IQ 25-39; and Profound, IQ Below 24 (Klein et al, 1979). Educators, on the other hand, frequently use three classifications which are based on the individual's learning characteristics: educable mentally retarded (EMR); trainable mentally retarded (TMR); and Custodial (uneducable). Generally, the term trainable mental retardation is applied to individuals falling in AAMD's Moderate and Severe ranges of mental retardation (Hambleton & Zeigler, 1974) but there is some variability evident in the criteria adopted by various individuals and organizations.

Goldberg (1957), for example, describes the trainable mentally retarded as having IQs ranging from 35-50 and who will require some form of sheltered environment as adults. Others (Hambleton & Zeigler, 1974) cite IQ scores of 20-49 for those classified as trainable mentally retarded. Goldberg
estimated that the prevalence of school age "trainable" children in the United States was less than .5% of the school age population at the time of his paper. Their rate of development is thought to be 1/4 to 1/2 that of their chronological age-mates with the expectation that by adulthood they will be functioning from a 4-year-old to a 8-year-old level. Wertz and Guenther (1957) cited in Goldberg (1957), state that trainable mentally retarded children have the potential "for learning a) self care, b) social adjustment in the home and neighbourhood, and c) economic usefulness in the home, in a sheltered environment, or in the community under supervision" (p. 148). Johnson (1975) concurs with Goldberg's description adding that, in most instances in the case of trainable individuals, the cause of retardation has been physiological (i.e., brain injury, metabolic disorder, or genetic aberration). He reports that, as a group, their height and weight tend to be below average and that they experience a much higher incidence of visual, auditory, and other physical problems than does the general population. Johnson stresses that, particularly for the trainable retarded, education should be considered as part of a total life plan and should take into account their adult futures.

The educational authorities of the school board involved in this study used the following guide which defined trainable retardation as a severe learning disorder characterized by:
"(a) inability to profit from a special education programme for the educable retarded because of slow intellectual development;
(b) ability to profit from a special education programme that is designed to accommodate slow intellectual development; and
(c) limited potential for academic learning, independent social adjustment and economic self support." (Langdon, 1982).

Integration/Segregation. In reference to educational placements available to exceptional children there is a continuum in terms of the opportunity they afford the retarded child to interact with nonretarded children. Generally, the notion is that in an integrated setting, handicapped children have the opportunity at some time during the day to be involved with nonhandicapped children. Integration can be extended to include most of the day spent in a regular class. This type of placement would fall at the far end of the continuum on the Integration side. On the other hand, integration may be limited to joining the other children for assemblies, recesses and lunch hours.

Segregation means separate groupings from others. Segregated placements typically include special schools and classes, which are physically removed from the mainstream and have programmes designed to meet the needs of the specific population that they serve. These special schools fall at the end of the continuum on the segregated side.
Thus, special class placements, which fall about halfway along the continuum, might be classified as integrated settings in one study or segregated settings in another study. In other words, the concepts of integration and segregation are relative ones.

Warnock (1978) has delineated three types of integration: locational, social, and functional (Karagianis & Nesbit, 1979). Each type involves a greater degree of contact with normal children. Locational integration refers to a special classroom in a regular school; the children have little opportunity for contact with the other children in the school. Social integration allows the exceptional child to spend time with nonhandicapped children. In functional integration the retarded child actually participates in the regular classroom lessons with the other children. Functional integration is thought to be most appropriate for the least handicapped child. Warnock, while recommending integration, cautioned that care be taken to ensure that children not be put into situations that they are not ready to handle. She felt that there was still a place in the range of educational provisions for special schools; these would be to serve children having severe and complex disabilities. Authors Karagianis and Nesbit (1979) suggest that, for trainable mentally retarded children, locational with the possibility of social integration is a desirable object.

In the present study, the integrated setting refers to
a special class for trainable mentally retarded children which was housed in a regular school in a suburb. Contact with the other children occurred mainly at recess and noon hour, and occasionally at assemblies. A few of the children attended the regular art, music and/or library classes. This, for the most part, corresponds to Warnock's description of locational integration with the opportunity for some social integration and is the type of integration that Karagianis and Nesbit recommend for trainable children.

The segregated setting referred to in the present study was a school for the trainable mentally retarded. It was a building unto itself and served this population only.

Arguments for Integration and for Segregation

When larger numbers of trainable mentally retarded children began entering the school systems in the 1950's they were placed in special classes or schools (Klein, Pasch, and Frew, 1979). At the time it was felt that these programmes, which allowed for lower teacher:pupil ratios, more individualized programming, and specially trained teachers, would be the best way to serve these children's needs.

During the 1960's when the human rights movement came to the fore, the idea of segregation in any form became repugnant to many. The concept of "normalization", "making available to the mentally retarded patterns and conditions of everyday life which are as close as possible to the norms and patterns
of the mainstream of society" (Nerje, 1969b, p. 17 in Wolfensberger, 1972) became very popular.

Much discussion has ensued since that time about the most appropriate placements (i.e., integrated or segregated) for the education of retarded children. Karagianis and Nesbit (1979) believe that the most protracted of the debates on this subject have revolved around the trainable children.

Many of the arguments which have been advanced for both integration and segregation have not been based on hard data; often times no reference is made as to what population of retarded children those advancing the arguments are referring. What may be applicable for children in the educable range may not be so for children in the trainable range. Moreover, given the heterogeneous nature of children in the trainable range, differing degrees of integration/segregation may be necessary depending on the individual child's needs. Nevertheless, it is relevant at this point to review those arguments most frequently cited.

In the United States Public Law 94-142 (1975) established the right of trainable mentally retarded children to public education and dictated that such education be carried out "in the least restrictive environment". This term became associated with the concepts of "normalization" and "mainstreaming" (the educational equivalent of normalization), although as Karagianis and Nesbit (1979) note, neither was used in the legislation.
Vitello (1974) listed cautions to be taken "on the road to normalization" (p. 39). He urged educators to think positively and optimistically but also to be realistic in predicting outcomes and to bear in mind that the severely retarded are individuals with distinct differences. He recommended that efficacy studies be conducted before curricula and programmes become widely implemented. He cautioned educators to be aware of society's attitude to and ignorance of the mentally retarded and to build in public education programmes as part of integration plans. He warned that special education was at a crossroad and that the signs should be taken into consideration; if this was not done he felt that the road to normalization would turn "into a dead end street" (p.40).

Schwartz (1977) also expressed concerns that we have been carried away with idealism and lost sight of the fact that retarded children are not normal in many respects, particularly in those related to education. In her words, "The trend of the 1960's has left us idealistically blinded to painful truths of psychological reality" (p.30). While denying that all are created equal, she does not deny the rights to equal opportunities or to social and emotional protection from the effects of one's inequality. She indicates the harm that might be done to the retarded in society's eagerness to help them. By placing them in environments which they are not able to handle, there is the risk that the defenses of
the retarded will be overtaxed and that they will not be able
to function to their potential.

Gardiner (1977) has been an influential advocate of in-
tegrating retarded children with normal children. One of the
several reasons that he gives for integration is that by
segregating and labeling retarded children, we risk stigma-
tizing them and lowering their self esteem. He suggests that
they see themselves as not normal and unable to fit into
school systems and society. This in turn leads to a self-
fulfilling prophecy. Others (Schloss and Sedlak, 1982) speak
of another type of self-fulfilling prophecy that can be
created through integration placement that has not been well
planned. By placing retarded children in situations where
the tasks are too challenging, failure occurs; this leads to
an increase in expectancy for failure in future endeavours
and a subsequent decrease in their motivation. Schloss and
Sedlak state how difficult it is, when the retarded child is
placed with normal children, to find tasks that allow for
success while at the same time are not demeaning for the
child.

Another point made by Gardiner (1977) in favour of inte-
gration is that it affords the mentally retarded the opportunity
to model the appropriate behaviour of their non-retarded class-
mates. Integration advocates stress that, in settings limited
to mentally retarded children, the only observable behaviour is
that of the other retarded children. Schloss and Sedlak
(1982), however, point out that there is little to prevent the retarded child in a regular setting from choosing the wrong child to model (e.g., class clown). The retarded child may also miss out on some of the subtleties in social interaction and imitate what is an appropriate behaviour in one setting in another setting where the behaviour is inappropriate. In other words, the situation is much more complex than simply having normal behaviour available for the mentally retarded child to model. Schloss and Sedlak advocate that educational and behaviour programmes for the retarded involve modeling and practicing positive social behaviours immediately following a troublesome incident.

Mlynek, Hannah and Hamlin (1982) speculate that some parents have reservations about mainstreaming because of the fear that their child will not receive an appropriate education unless he/she is in a self-contained area. Some have gone to great lengths and put much effort into obtaining specialized classrooms and schools for their retarded children. They know that their children's teachers have received specialized training and that special resources (e.g., speech services) are available to their children. Many are reluctant to deny their children these things in exchange for the opportunity for them to interact with normal children. In answer to this concern, others (e.g., Birch, 1974) have stated that, with the development of programmed learning materials and other educational instruments, the burden of providing specialized
programming has been eased and can be incorporated into a regular classroom.

Further reluctance on the part of some parents to integrate their children lies in the fear of exposing them to ridicule. They feel more comfortable knowing they are in a protected environment. Others (Scott, 1972, Birch, 1974) argue that society needs to be exposed to the handicapped in order to learn about them, break down stereotypes, and accept them as equal members. They point out that integration at early ages will work towards building a more positive attitude on the part of normal individuals. In addition, they state that if the long term goal is to have the mentally retarded integrated into society when they are adults, this may be served best by having them integrated at a young age. From the beginning they can be exposed to the risks that are an inevitable part of growing up.

Studies Related to the Education of Trainable Retarded Children

Although there have been a number of studies devoted to comparing the performance of mentally retarded children in different educational settings, many of them have employed educable mentally retarded children as subjects. Because trainable mentally retarded children do not represent a homogeneous group in and of themselves and are very different from educable children in their needs, many of these studies on the educable population are not relevant.
Thus, the following discussion will be limited to those studies dealing with trainable mentally retarded children. It will review the history of educational services to trainable children, studies describing various programmes available, and studies comparing the effectiveness of one type of programming over another.

**Historical Background.** In his book describing policies and practices on providing service for the mentally retarded in Ontario, Simmons (1982, p.90) includes a review of the history of special education. The first special class for mentally retarded children was established in Germany in 1863. In the 1880's, public day schools were established in Providence, Boston, Chicago, and Philadelphia in the United States. Simmons cites the following as one of the objectives of this service: "to remove feeble-minded children from the regular school system where they were thought to constitute a disruptive influence on the regular pupils" (p.90). In addition, the classes/schools were intended to provide special education suited to the particular needs of retarded children and to protect them from harassment by the children in the regular system. Unfortunately, in his review, Simmons does not distinguish clearly between the terms special classes and special schools. He also does not specify the level of retardation in many instances.

Simmons suggests that Helen MacMurchy in her role as school medical inspector for the Toronto Board of Education
played a prominent role in Ontario's provision of educational services to the mentally retarded. She was appointed to this position in 1910 and her mandate was to "inquire into the extent of mental deficiency in the schools" (p.90). At the time of her appointment, the first two special education classes were opened by the Toronto Board of Education. Simmons states that, in MacMurchy's view "the real function of the school is that of a clearing house" (p.90). In other words, the function was that of sorting out what was the cause of a child's particular difficulties in learning. For example, if the cause of the slow development was determined to be physical (e.g., sight, hearing, etc.) treatment was prescribed and the child was placed in an appropriate programme; if the child was diagnosed as being severely or moderately mentally retarded he/she was referred to an institution. The notion was to remove these troublesome children, who were thought to grow into dangerous adults, from the mainstream for the protection of society. At the time, it was generally acknowledged that these children were not capable of any development and thus needed custody rather than treatment.

Shortly after these classes were established in the public school system, a distinction was made between those children eligible for admittance into them and those retarded children who were excluded. The criterion for admission was altered to exclude those children whose
"mental age" was less than legal school age (i.e., trainable mentally retarded children). In the 1940's the parents' movement launched an attack on the existing attitudes and on the institutional system.

**Descriptive Studies.** In the United States many were also of the opinion that children, who were not expected to attain academic skills of a degree sufficient for literacy, should be excluded from the education system (i.e., public schools should be for the educable and not the trainable retarded). Lieberman (1953-4) set out to dispute the above philosophy by designing a treatment programme for children at a California State Hospital. The children, ranging in age from 7 to 11 years with IQs falling between 25 and 50, were carefully assessed so that training programmes could be prescribed. They were divided into two classes; teachers had been selected to ensure that they had knowledge of retarded children's behaviour and the motivation to work with them as part of an interdisciplinary team. Lieberman reported that all children made gains in social development. While acknowledging that he did not have a formal control group, he stated that an informal comparison with a group of children who would have met criteria to be in the experimental group led him to conclude that there was considerable difference between the two groups in terms of their development at the end of the training period. He urged educators to reconsider their definition of "educable" and to allow
for the care of severely retarded children in the community.

When schools began responding to parents' requests to provide programming for trainable retarded children in the late 1940's and in the 1950's, several studies were conducted to examine the progress made by these children in the experimental programmes. Dunn (1963) describes several of these studies, one of which is that of Reynolds & Kiland (1953). According to Dunn, Reynolds and Kiland (1953) interviewed parents and teachers of trainable mentally retarded children, ages 7 through 20, who were enrolled in special classes. Both parents and teachers reported that the children had made progress in socialization skills, however, they did not make appreciable gains academically. In fact, parents' expectations for their children to learn academic material lessened as the programme continued. Reynolds and Kiland concluded that the special class provided a real service in the form of parent relief and also in the development of socialization skills in the children. At that time many of these children were being cared for at home.

Goldstein (1956 - The Illinois Study) as reported by Dunn, conducted a two year study on children attending special classes for trainable mentally retarded. Among the findings were that both parents and teachers reported more progress in the first year than in the second year. Again, as Reynolds and Kiland reported, parents began to lessen their expectations for their children to become self sufficient.
Tisdall (1960-61) followed up Goldstein's study by the use of questionnaires and interviews with parents, teachers, and directors of education. He found a slight decline in the number of special classes available and made the statement that for 93 percent of trainable mentally retarded children there were no provisions in Illinois. He stressed the need for "the allocation of more public school classroom space."

Scott (1972) describes a two-room school for trainable mentally retarded children (Huron Hope) from her perspective as the school's principal. It is housed in a regular elementary school (J.A.D. McCurdy) which is located in Centralia, Ontario. At the time of her paper, Huron Hope had been integrated at J.A.D. McCurdy for three years and Scott had become a strong advocate for this type of programming. She points out what she saw as the many advantages of the two schools sharing the same facility; among those were that the retarded children had access to the library, gymnasium, and other schools areas. They also joined the nonretarded children for assemblies and events such as crafts and plays in different classrooms. The younger children often attended the kindergarten class for playtime, music, and gymnasium activities. Grade 7 and 8 pupils were frequently paired with a retarded child when the classes went on field trips. Scott feels that this provided the higher functioning retarded children with stimulating experiences and that they were challenged in a positive way that might not otherwise
have been available to them. Scott states that one of the biggest benefits of this type of programming was that it allowed the normal children to learn about the retarded children. It is Scott's opinion that prejudices that had been built up were broken down as the nonretarded children became quite interested in and learned about the retarded children. This interest also spread to their parents who were directed towards the special classrooms during open house and other school activities by their children. Parents of the retarded children, especially those in the immediate vicinity, reported to Scott that much of the stigma attached to having a retarded child had been alleviated since the children were no longer segregated in a special building.

**Efficacy Studies.** Shortly after the descriptive studies were released more formal types of comparison studies were conducted in the hopes of determining which type of placements were most effective in providing for the needs of trainable mentally retarded children. These are frequently referred to as efficacy studies. As several authors (Dunn, 1963, Meyers, Yoshida & MacMillan in Gotlieb, 1980) point out, most of the evaluation studies have numerous methodological problems. Meyers et al cite the following difficulties: inappropriate or biased sampling procedures, unreliable measurement instruments, inappropriate selection of skill to measure (i.e., does not correspond to the programme goal), an ill-
defined subject population, and failure to control for teacher differences. It is likely that these methodological problems have contributed to the conflicting opinions as to what is the most appropriate type of educational placement for trainable mentally retarded children. The following is a review of efficacy (evaluation) studies involving this population.

Early efficacy studies on trainable mentally retarded children often involved comparisons between/among institutions, special schools, special classes, and/or home settings. As cited by Dunn (1963), Johnson and Capobianco (1957 - The New York Study) compared the effectiveness of seven special day classes (location not specified - 41 trainable mentally retarded children) with ten half-day classes in residential facilities (96 children) over a two-year period. Several measures were used: behaviour checklists; Vineland Social Maturity Scale; and intelligence, articulation, and language tests. In addition to examining differences related to placements, Johnson and Capobianco reported differences between the higher and lower functioning children. Not unexpectedly, the children with higher IQ's (above 25 and in some comparisons, above 30) made the most progress. Both groups showed positive changes in terms of behaviour. The authors concluded that these improvements were no greater than that which could be expected from mental age growth alone. The fact that they progressed at all would have been a major finding 25 or 50 years earlier. There were no sig-
nificant differences between the children according to placement. In summary, Johnson and Capobianco stated that children with IQ's below 30 could not profit from a school programme and that provision of special day classes was not the solution to meeting the needs of the trainable retarded.

Dunn (1973), after reviewing the above and other studies (i.e., Guenther, 1956; Hottel, 1958; Caine & Levine 1961), and acknowledging the methodological flaws in all of them, stated that there was little evidence that special day classes were effective "for homogeneous groups of trainable children with IQs over the full range of 25-50" (p.155). He thought that special classes for trainable children should include only those children with IQs above 35 or 40. He also recommended that long term studies be conducted in order to follow children through the schools into adulthood and that the "relative efficiency of different teachers and different instruction procedures" (p. 155) be examined in future studies. Dunn recognized the complexity of researching this area and emphasized that the effectiveness of programmes/placements depends on many factors (i.e., individual differences in the children, their parents, and siblings).

The variable on which authors chose to compare children in different types of educational placements often reflects the aspect of programming that, in their view, is most important. Kern and Plaeffe (1962) concur with several others in the field (Goldberg, 1957; Johnson, 1975), that
trainable mentally retarded children are limited in respect to making academic gains and will as adults require sheltered placements both for work and living arrangements. They contend that, in the best interests of these children, programmes should concentrate on the development of social skills and the elimination of inappropriate behaviours. Thus, they feel that efficacy studies directed at measuring this variable are the most helpful. As noted earlier, the difficulty in researching this area is the lack of reliable and valid assessment measures. Consequently, differences in children's social adjustment as reported by their teachers may reflect a particular teacher's orientation rather than the type of educational setting. For example, special class teachers may be more accepting of their retarded children's behaviour than are regular classroom teachers. The two studies which follow compare social interaction of trainable mentally retarded children in integrated and segregated placements. The authors of both these studies have attempted to avoid confounding their findings with teacher bias by directly observing the children's behaviour.

Wilton and Densem (1977) focus on preschool children because they contend that the early years are critical in terms of social and cognitive development. They hypothesized that "the social interaction of preschool intellectually handicapped children would be greater in a regular than in a segregated preschool because of the more favourable social
learning opportunities which are almost certainly available" (p.165). They also predicted that the intellectually handicapped children would show less social interaction than their non-handicapped classmates in the regular school. Subjects in the study were 27 children, ages 3-5 years, whose IQ scores were below 50. This is one of the first studies to acknowledge the role of home environments. The authors state that the socioeconomic status, in terms of the fathers' occupations, were closely comparable to New Zealand norms. The nonretarded children (n=60) were chosen at random from children attending the same preschools as those in which the retarded subjects were integrated. A time sampling procedure was employed to obtain information about each child's social participation. Social participation was classified according to the Parten Scale of Social Participation; Categories ranged from a low of 1 (unoccupied) to a high of 6 (cooperative play).

Wilton and Denson reported that the retarded children showed significantly less social interaction than their non-retarded age-mates. However, the retarded children who were attending the regular preschool showed a significantly higher level of social interaction than those attending a special preschool. While reporting the above, the authors acknowledged a sampling problem that many in the past have not. They point out that the retarded children were not chosen randomly for the integrated placement and, in fact, may have been candidates for integration because they were higher functioning than the
retarded children in the special programmes. Pursuing this
tack they examined the behaviour of two of the children who
attended both the special school and the integrated school.
Their findings were that these children exhibited more group
play in the regular preschool than they did in the special
preschool. They attributed the difference in behaviour in
the different settings to the facts that: most of the
children in the special preschool did not interact with each
other; the activities and materials in the special pre-
school were, for the most part, geared towards solitary
activities in contrast with those of the regular preschool;
and the teachers in the regular preschool had received a
higher level of training than had the teachers in the special-
ized setting. Wilton and Densem recommended further investi-
gation into the effects of integrated preschool attendance
upon children who would normally attend a special preschool.
They also suggested that ways be sought to improve opportuni-
ties for social integration in special preschools.

Of particular relevance to the present paper because
the educational settings are so similar is a study conducted
by Ziegler and Hambleton (1976). Two classes of young
children attending a special school for trainable mentally
retarded children (segregated setting) were moved to special
education classes in a regular school (integrated setting).
The children in the integrated setting were matched on
several measures (e.g., sex, chronological age, mental and
social age etc.) with those in the segregated setting. The mean IQ for the integrated group was 40.4; for the segregated group the mean IQ was 42.2. These authors were interested in examining social interactions of the children in hopes of refuting previous concerns which stated that attempts to integrate trainable mentally retarded children into regular schools are not to their advantage because these children become the objects of scorn and are teased.

Using a behaviour checklist Ziegler and Hambleton categorized children's behaviour as: inadequate, adequate, or extremely adequate. They found no significant differences between the mentally retarded children's behaviour in the integrated setting and that of the children in the segregated setting on two different occasions (December/January, April/May). In examining the behaviour of the non-retarded children there was no evidence to indicate that they singled out in any negative fashion or victimized the retarded children. An analysis of the interactions of the retarded children in both settings and of the normal children showed that the retarded children play and converse together but not as frequently or as effectively as do the normal children. There were more incidents of provoked aggression among the retarded children than there were among the normal children.

Ziegler & Hambleton conclude that the placement of special classes for trainable mentally retarded children in the regular school was "effective in promoting interaction between retarded
and nonretarded students and thus in providing a more normal environment for the retarded children" (p.460). The planning that went into placing the children in the two classes is outlined by the authors in an earlier paper (Hambleton and Ziegler, 1974). Essentially, the move was set up as an experimental programme which was to be carefully monitored from the beginning so that any negative effects either academically or socially would be noted and the integration project abandoned. Care was taken to ensure that all involved (e.g., teachers, principal, students, parents) of the receiving school would be prepared to receive the two classes of trainable mentally retarded students. No doubt this contributed significantly to the positive interactions of the retarded and nonretarded children.

Ziegler and Hambleton's results pertaining to the behaviour of the normal children toward retarded children are confirmed by Patterson (1983). He observed the social interaction of children in a regular classroom into which a trainable mentally retarded child was integrated. Patterson reported that there was "little if any discrimination by the nonretarded children, in the sense of exclusion or rejection against the retarded child" (p.12).

A recent study dealing with integration of trainable mentally retarded children and a very specific aspect of development (i.e., motor) was conducted by Beuter (1983). Two groups of children, mean age approximately 11.5 years and 15
years, were integrated into grades 3 and 6 physical education programmes respectively for over a 5 month period. Motor assessments were conducted pre- and posttest on these children as well as on control groups of trainable and normal children who were in nonintegrated settings. Posttesting revealed that the integrated groups of trainable children made significantly more motor gains than did the retarded children in the control group; there was no significant difference between integrated and control groups of normal children. In other words, introducing the retarded children into the physical education programme did not hinder the development of the normal children and actually facilitated that of the retarded children. Although this was a well-designed study and indicated positive results of integrating trainable children with normal children, the behaviour involved was very specific. Such findings may not be evident when other skills are measured. It is unfortunate that, while the groups were being compared, other areas of behaviour were not assessed (e.g., adaptive behaviour).

After reviewing the literature and the programmes that were available to trainable children, the particular school board involved in the present study decided to establish, on an experimental basis, a satellite programme for trainable retarded children in a regular school. Prior to this, educational programming for these children had been provided in a school designed exclusively for trainable children and
physically segregated from other educational programmes. The experimental programme began in September, 1981, with 14 children attending the special school (segregated placement) and 14 children attending the two special classes in a suburban school (integrated placement). The children were selected for either the integrated or segregated placement by school board personnel. The method of selection was determined by the school board according to criteria that it had developed.

In May, 1982, baseline data were obtained on the children who were attending the integrated or segregated placements (Orr, 1983). There were 9 girls and 5 boys attending the integrated programme and 5 girls and 9 boys attending the segregated programme. The children in the integrated programme ranged in age from 6 years 9 months to 8 years 8 months; the age range at the segregated setting was 5 years 8 months to 11 years 4 months. The test measures included: the WISC-R, a standardized test of intellectual functioning; the Wide Range Achievement Test (WRAT) which tests reading word recognition and written spelling and arithmetic abilities; the Peabody Picture Vocabulary Test-Revised (PPVT-R) which requires the child to point to one of four pictures which goes best with a word spoken by the examiner; The Adaptive Behaviour Scale (ABS) which provides information about the child's independence and social skills; and the Quick Neurological Screening Test designed to assess functioning areas in the child which might suggest neurological damage or
forewarn of learning problems.

Orr (1983) reports that the WISC-R Full Scale IQs for the two groups ranged from less than 40 to 70 for the integrated group and less than 40 to 75 for the segregated group. On the PPVT-R the standard scores of the children in the segregated group all fell below 55, with 55% of them falling below 45. The PPVT-R standard scores of the integrated children all fell below 60 with 50% of the scores falling below 45 (See Table 1). (Precise WISC-R IQs and PPVT-R standard scores are not available for raw scores falling below 40 and 45 respectively.) An analysis of the language and socialization scores on the ABS indicated that the "mean percentiles of both groups were virtually identical" (Orr, 1983, p. 4). Orr states that there appeared to be considerable similarity between the two groups in May of 1982 and that the data collected would be most useful for followup purposes examining changes in the children in each of the two settings.

Because Bill 82 has ramifications for trainable mentally retarded children in Ontario and is scheduled for full implementation in September 1985, it seemed relevant to gather information related to types of programming available for this population. Thus, the purpose of the present study was to followup the investigation by Orr (1983). The children involved in that study were readministered the WISC-R, WRAT, and PPVT-R. In addition, each child's teacher completed the ABS. The data were analyzed to examine changes in performance between the first and second assessments and the relationship of such changes to school placement.
Table 1  
Descriptive Information (1982) on Children Tested in Initial Investigation (Orr, 1983)

<table>
<thead>
<tr>
<th>Descriptive Data</th>
<th>Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Integrated</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>n</strong></td>
<td>14</td>
</tr>
<tr>
<td><strong>Range of Ages (months)</strong></td>
<td>81-104</td>
</tr>
<tr>
<td><strong>Range of WISC-R</strong></td>
<td></td>
</tr>
<tr>
<td>Full Scale IQ Scores</td>
<td>&lt;45-70</td>
</tr>
<tr>
<td><strong>Range of PPVT-R</strong></td>
<td></td>
</tr>
<tr>
<td>Standard Scores</td>
<td>&lt;40-60</td>
</tr>
<tr>
<td><strong>Range of WRAT</strong></td>
<td></td>
</tr>
<tr>
<td>Reading Standard Scores</td>
<td>&lt;46-90</td>
</tr>
<tr>
<td><strong>Range of WRAT</strong></td>
<td></td>
</tr>
<tr>
<td>Spelling Standard Scores</td>
<td>&lt;46-60</td>
</tr>
<tr>
<td><strong>Range of WRAT</strong></td>
<td></td>
</tr>
<tr>
<td>Arithmetic Standard Scores</td>
<td>&lt;46-85</td>
</tr>
</tbody>
</table>
CHAPTER II
Method

SUBJECTS

The children who participated in this follow-up study were tested in 1982 as part of the initial investigation (Orr, 1983). These assessments took place between March 9, 1982 and May 20, 1982. The September prior to their 1982 assessment, they had been assigned to one of two special education programmes for trainable mentally retarded children. The children in one programme attended a school designed solely to meet the needs of trainable retarded children; this placement is referred to as the segregated setting. The children in the other programme attended one of two satellite classrooms of the special school which were housed in a regular suburban school; this is referred to as the integrated setting. See Appendix for description of the two settings.

Eligibility requirements for the integrated classrooms, as determined by the board of education involved, were somewhat more stringent than those for placement in the special school. For the former, the children could not be physically handicapped to the extent that they would require personal assistance to use school facilities or to utilize programme equipment. They also had to be able to express personal needs with reasonable facility. In addition, children with a history of aggressive, disturbing behaviour were ineligible for the integrated programme. Thus, group assignment (i.e.,
integrated/segregated) was decided by school board personnel in conjunction with parental input and was not done by random means. For the most part, other than presenting the pre-test scores, the board of education involved did not supply background information on any of the children.

At the time of the initial investigation (1982 pretest), 28 children were assessed, 14 in each placement. There were 9 girls and 5 boys, aged 6 years 9 months to 8 years 8 months attending the integrated programme. In the segregated programme there were 5 girls and 9 boys, aged 5 years 8 months to 11 years 4 months.

Because of attrition, for the follow-up (i.e., 1984 posttest), seven children (4 girls and 3 boys) who had been in the integrated setting in 1982 and continued in that placement, were reassessed. In 1984 their ages ranged from 8 years 11 months to 10 years 7 months. Although the children were assigned to two classrooms, they were all housed in one room and were taught by two teachers who used a team-teaching approach. Nine children who had been attending the segregated setting and remained there were reassessed in 1984. This group included 6 girls and 3 boys, aged 7 years 8 months to 13 years 4 months, who were in four different classrooms within the special school. There was no significant difference in the ages (in months) of the children in the two groups (Mann Whitney U (7,9) = 14, p > .05)
DEPENDENT MEASURES

The children were retested on the: Weschler Intelligence Scale for Children - Revised (WISC-R); Peabody Picture Vocabulary Test-Revised Form (PPVT-R); Wide Range Achievement Test (WRAT); and the Adaptive Behaviour Rating Scale (ABS). The following is a brief description of the tests.

The WISC-R is a test of intelligence which is administered individually to children ages 6 years to 16 years 11 months. It is divided into two main parts, Verbal and Performance, each of which has six subtests. (One in each of the Verbal and Performance scales is optional.) On the Verbal Scale, all the items require a verbal response. Tasks include defining words, repeating digits, answering factual, comprehension, and arithmetic questions. Items on the Performance Scale tap abilities related to putting jig saw puzzles together, replicating designs with blocks, sequencing pictures to make a story, locating the missing item in a picture, and a pencil task. No verbal responses are required; instructions involve little verbalization on the examiner's part and can be indicated through gestures. Both Verbal and Performance scales yield an IQs, the average of which is 100 (SD=15). When subtests of both scales are combined, a Full Scale IQ is obtained, again with an average score of 100 (SD=15).

The WRAT is an achievement test which can be administered either in groups or individually. It consists of three sub-
tests: Reading; Spelling; and Arithmetic. The child is asked to read individual words aloud, to work out answers to written arithmetic questions, and to write words that are dictated. The WRAT yields grade equivalent, standard, and percentile scores and is normed on ages 5 to 64 years.

On the PPVT-R the child is asked to point to one of four pictures which goes best with a word spoken by the examiner (i.e., no verbal response is required). Raw scores can be transformed into age and standard score equivalents.

The Adaptive Behaviour Scale is a behaviour rating scale which is designed to be used with handicapped (primarily retarded) children and adults. It provides information about how the individual is coping with the environment and is divided into two parts. (Information is obtained by interviewing someone close to the client -- parent, teacher.) Part One, which has ten behaviour domains, is related to developmental aspects of behaviour (e.g., language and physical development). Part Two is designed to provide measures of maladaptive behaviours such as hyperactivity, withdrawal, and acting out; it has fourteen behaviour domains. Most domains, in both Parts One and Two, have several subdomains. The test is normed on mentally retarded persons in United States institutions; raw scores are converted into percentile ranks for each domain using 11 age categories (i.e., 3 to 69 years). The authors state that one purpose of the scale is to provide an objective measure for comparing an individual's behaviour
over time in order to evaluate the suitability of current curricula or training programmes.

PROCEDURE

All the children in this study were administered the WISC-R, the PPVT-R, and the WRAT on two different occasions. The pre-testing of May 1982 was conducted by a board of education psychometrist. In addition, the children's teachers were asked to complete the ABS.

The current assessments were conducted individually in standardized fashion by the author and a colleague who was an experienced psychometrist. Three children attending the integrated setting had been recently (within two months) assessed on the measures employed in this study by a school board psychometrist. Rather than reassess them, these scores were used as the posttest scores. Thus, in neither the integrated or the segregated setting were all the children in the group assessed by the same psychometrist for the post-testing. Teachers of all the children were asked to complete the ABS.

The 1982 data on the 16 children who were currently available for the posttesting were retrieved and used to compare the progress of the two placement groups.
CHAPTER III

Results

The 1982 pretest scores on the PPVT-R, WISC-R, and WRAT and ABS were obtained on the 16 children who were available for retesting in 1984. A decision was made to use raw scores in the analyses because many of the children did not receive high enough scores to obtain precise percentiles, IQs, or standard scores. Therefore raw scores appeared to most accurately reflect their performance. Table 2 presents the 1984 information in summary form.

Pre-posttest score differences (i.e., improvement) were calculated for each child on each test and/or subtest; point biserial correlations were calculated to provide a measure of the relationship of improvement to school placement. Further analyses were carried out (Mann-Whitney U Tests) to determine if the improvement of the children in one school placement was significantly greater than that of the children in the other school placement.

The pretest scores were also analyzed test-by-test (by means of a Mann-Whitney U Test) to see if there were any significant differences in the scores of the 7 children attending the integrated programme and those of the 9 children attending the segregated programme.
Table 2

Descriptive Information (1984) on Children Tested in Follow-Up Study

<table>
<thead>
<tr>
<th>Descriptive Data</th>
<th>Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Integrated</td>
</tr>
<tr>
<td>n</td>
<td>7</td>
</tr>
<tr>
<td>Range of Ages (months)</td>
<td>107 to 127</td>
</tr>
<tr>
<td>Range of WISC-R</td>
<td></td>
</tr>
<tr>
<td>Full Scale IQ Scores</td>
<td>$&lt; 40 - 61$</td>
</tr>
<tr>
<td>Range of PPVT-R</td>
<td></td>
</tr>
<tr>
<td>Standard Scores</td>
<td>$&lt; 40 - 56$</td>
</tr>
<tr>
<td>Range of WRAT</td>
<td></td>
</tr>
<tr>
<td>Reading Standard Scores</td>
<td>$&lt; 46 - 67$</td>
</tr>
<tr>
<td>Range of WRAT</td>
<td></td>
</tr>
<tr>
<td>Spelling Standard Scores</td>
<td>$&lt; 46 - 67$</td>
</tr>
<tr>
<td>Range of WRAT</td>
<td></td>
</tr>
<tr>
<td>Arithmetic Standard Scores</td>
<td>$&lt; 46 - 61$</td>
</tr>
</tbody>
</table>
The results of the point biserial correlations are reported in Table 3. With the exception of the WISC-R Coding subtest \( r = -0.01 \), PPVT-R \( r = -0.51 \), and ABS subdomains -- Social Language \( r = -0.33 \), and Responsibility \( r = -0.65 \) the direction of greater score improvement was in favour of the children who attended the integrated setting. According to \( t \) tests the point biserial coefficients were significant on the following tests and subtests: Sum of WISC-R Verbal Subtests; WISC-R Information, Arithmetic and Comprehension subtests; PPVT-R; and ABS Expression, Comprehension and Responsibility subdomains. As a further check on the above findings, Mann-Whitney U Tests were also employed in analyzing the data. The following is a test-by-test presentation of the results and subsequent analyses.
Table 3

Point Biserial Coefficients Between Pre-Posttest Score (raw) Change (i.e., Improvement) and School Placement

<table>
<thead>
<tr>
<th>Test</th>
<th>Coefficient</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>WISC-R</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum of Verbal Subtests</td>
<td>.63*</td>
<td>16</td>
</tr>
<tr>
<td>Information</td>
<td>.52*</td>
<td></td>
</tr>
<tr>
<td>Similarities</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Arithmetic</td>
<td>.52*</td>
<td></td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.31</td>
<td></td>
</tr>
<tr>
<td>Comprehension</td>
<td>.75*</td>
<td></td>
</tr>
<tr>
<td>Sum of Performance Subtests</td>
<td>.31</td>
<td></td>
</tr>
<tr>
<td>Picture Completion</td>
<td>.46</td>
<td></td>
</tr>
<tr>
<td>Picture Arrangement</td>
<td>.31</td>
<td></td>
</tr>
<tr>
<td>Block Design</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>Object Assembly</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>Coding</td>
<td>-.01</td>
<td></td>
</tr>
<tr>
<td>PPVT-R</td>
<td>-.51*</td>
<td>16</td>
</tr>
<tr>
<td>WRAT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td>.29</td>
<td>15</td>
</tr>
<tr>
<td>Spelling</td>
<td>.03</td>
<td>16</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>.23</td>
<td>16</td>
</tr>
<tr>
<td>ABS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expression</td>
<td>.55*</td>
<td>15</td>
</tr>
<tr>
<td>Comprehension</td>
<td>.68*</td>
<td>15</td>
</tr>
<tr>
<td>Social Language</td>
<td>-.33</td>
<td>15</td>
</tr>
<tr>
<td>Responsibility</td>
<td>-.65*</td>
<td>13</td>
</tr>
</tbody>
</table>

*P .05

Note. Negative sign indicates improvement in favour of segregated group; otherwise, improvement is in favour of the integrated group.
Peabody Picture Vocabulary Test (PPVT-R)

There were no significant differences in the 1982 raw scores of the children attending the integrated programme and those of the children attending the segregated school (Mann-Whitney U (7, 9) = 28, p > .10). Table 4 presents the means and standard deviations of the 1982 and 1984 raw scores of the children in both programmes.

The change in pre-posttest scores (i.e., improvement) for each child was calculated and the improvement made by each group compared. There was a significant change in the scores of the children in the segregated setting over those of the children in the integrated setting, U (7, 9) = 11.5, p < .05 (i.e., the children in the segregated setting improved their performance on the PPVT-R more than the integrated children improved their performance).

With the exception of one child, all the children's standard scores (both in integrated and segregated placements) fell below 61 at the time of the posttesting.

Wechsler Intelligence Scale for Children - Revised (WISC-R)

Table 5 contains the means and standard deviations for the sums of the subtest raw scores for the WISC-R Verbal and Performance Scales for 1982 and 1984. When the pretest scores of the integrated group were compared to those of the segregated group, the groups were not found to be significantly different U (7, 9) = 28.5, p > .10 on either the Verbal or Performance subtest totals.
Table 4

Means and Standard Deviations of 1982 and 1984 PPVT-R Scores (raw) for Children in Integrated or Segregated School Placements

<table>
<thead>
<tr>
<th>Placement</th>
<th>n</th>
<th>Year</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1982</td>
<td>1984</td>
<td></td>
</tr>
<tr>
<td>Integrated</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td>39.57</td>
<td>46.86</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td>10.39</td>
<td>13.57</td>
<td></td>
</tr>
<tr>
<td>Segregated</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td>38</td>
<td>53.22</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td>19.88</td>
<td>18.42</td>
<td></td>
</tr>
</tbody>
</table>
Table 5


<table>
<thead>
<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Integrated</td>
<td>7</td>
<td>16.57</td>
<td>29.71</td>
<td>22</td>
<td>33.43</td>
</tr>
<tr>
<td>M</td>
<td></td>
<td>9.29</td>
<td>9.99</td>
<td>18.57</td>
<td>19.53</td>
</tr>
<tr>
<td>Segregated</td>
<td>9</td>
<td>15.78</td>
<td>19.67</td>
<td>19.55</td>
<td>24.33</td>
</tr>
<tr>
<td>M</td>
<td></td>
<td>10.38</td>
<td>12.34</td>
<td>24.22</td>
<td>28.04</td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

The difference between pre and posttest scores (i.e., improvement) was calculated for each child on each Verbal and Performance subtest. A comparison of the total of the pre-posttest difference scores on the Verbal subtests of the children in the integrated group and those of the children in the segregated group yielded a significant difference, \( U(7, 9) = 7.5, p < .01 \), in favour of the children in the integrated group. In other words, the integrated children improved their scores on the WISC-R Verbal subtests more than did the children in the segregated group. No such difference (\( U(7, 9) = 21, p > .10 \)) was found between the integrated and segregated groups on the pre-post Performance subtest scores (i.e., one group did not improve significantly more than did the other).

Further analyses yielded no significant differences in any of pretest WISC-R subtest raw scores between the integrated and segregated groups, \( U's(7, 9) \) all \( 19.5, p > .10 \). Pre-posttest change scores (i.e., improvement) were calculated on the raw scores of each subtest for each child. The only significant difference on these scores between the integrated and segregated groups was on the Comprehension subtest. The integrated group improved significantly more than did the segregated group on this subtest, \( U(7, 9) = 2.5, p < .002 \).

The Full-Scale IQs, with the exception of two children in the integrated group, all fell below 55 at the time of the posttesting.
Wide Range Achievement Test (WRAT)

There were no significant differences on the 1982 Reading, Spelling or Arithmetic pre-test scores between the children in the integrated classes and those in segregated classrooms: $U(7, 8) = 29, p > .10$ for Reading; $U(7, 9) = 20.5, p > .10$ for Spelling; and $U(7, 9) = 26, p > .10$ for Arithmetic.

Analyses to examine any significant differences (i.e., improvements) in the pre-posttest WRAT Reading, Spelling, and Arithmetic scores of the children in one setting over those in the other did not yield any significant differences between the two groups ($U(7, 8) = 17.5, p > .10$ for Reading; $U(7, 9) = 30.0$ for Spelling; and $U(7, 9) = 22.5, p > .10$ for Arithmetic. Table 6 contains the means and standard deviations of the pre-and posttest WRAT raw scores for the children in both settings.

In 1984 the scores in the integrated group ranged from Kindergarten level 2 to Grade 2.4 in the segregated group from Prekindergarten 8 to Grade 3.4.

Adaptive Behaviour Scale (ABS) -- Part One

Information about the children was obtained from their teachers. Because their contact with the children was limited to school hours, they were unable to complete some sections of the test; they were also reluctant to make statements about some behaviours. Consequently data on the ABS is not as complete as for the other measures used in this study. In many
Table 6

Means and Standard Deviations of 1982 and 1984 WRAT Scores (raw) for Children in Integrated or Segregated School Placements

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated 7.</td>
<td></td>
<td>11.43</td>
<td>25.28</td>
<td>7.28</td>
<td>15.86</td>
<td>7.43</td>
<td>15.28</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>7.43</td>
<td>8.42</td>
<td>5.44</td>
<td>7.67</td>
<td>6.19</td>
<td>3.64</td>
</tr>
<tr>
<td>Segregated 9</td>
<td></td>
<td>12.37*</td>
<td>22.22</td>
<td>5.22</td>
<td>13.44</td>
<td>5.22</td>
<td>11.78</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>11.24*</td>
<td>13.84</td>
<td>8.13</td>
<td>9.84</td>
<td>5.17</td>
<td>4.84</td>
</tr>
</tbody>
</table>

*n=8
instances children obtained the maximum score possible on either the pretest, posttest, or both (i.e., reached the subdomain ceiling). Unfortunately this precluded data analyses on several subdomains. Means and standard deviations, where available, of Part One subdomain raw scores are presented in Table 7. For subdomains that are not explicit in skills being tapped, a brief description of areas involved is given.

Toilet Use (Maximum possible score, 10). No pretest scores were available on the integrated children on this subdomain; there were also no posttest scores for two children in the segregated setting. All the children with the exception of one child in each group received the maximum number of points possible on the posttesting indicating that they had no problems in toileting themselves.

Dressing and Undressing (maximum score, 14). A comparison of pretest scores between the integrated and segregated groups yielded no significant difference between the groups U (7, 9) = 21, p > .10. Four of the seven children in the integration group and two of the six children in the segregated group reached the test ceiling on the posttest. There were no posttest scores available for two of the nine children in the segregated group who were pretested in 1982. All score changes in both groups indicated improvement in these skills.
**Table 7**

**Means and Standard Deviations of 1982 and 1984 Part One ABS Scores (raw) for Children in Integrated or Segregated School Placements**

<table>
<thead>
<tr>
<th>Subdomain</th>
<th>Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Integration</td>
</tr>
<tr>
<td><strong>Expression</strong></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>12.86</td>
</tr>
<tr>
<td>SD</td>
<td>3.13</td>
</tr>
<tr>
<td>n</td>
<td>7</td>
</tr>
<tr>
<td><strong>Comprehension</strong></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>1.57</td>
</tr>
<tr>
<td>SD</td>
<td>1.40</td>
</tr>
<tr>
<td>n</td>
<td>7</td>
</tr>
<tr>
<td><strong>Social Language</strong></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>5.57</td>
</tr>
<tr>
<td>SD</td>
<td>1.27</td>
</tr>
<tr>
<td>n</td>
<td>7</td>
</tr>
<tr>
<td><strong>Responsibility</strong></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3.71</td>
</tr>
<tr>
<td>SD</td>
<td>.95</td>
</tr>
<tr>
<td>n</td>
<td>7</td>
</tr>
</tbody>
</table>
Sensory Development (maximum possible score, 6). This sub-
domain reflects information about vision and hearing acuity.
Of the 16 children tested in 1982, 11 of them (3 in the
integrated group and 8 in the segregated group) obtained
a score of 6. In 1984 three integrated children continued
to receive a score of six and the scores of the remaining
four children in that group increased (i.e., improved). The
1984 scores of three children in the segregated group dropped
slightly.

Motor Development (maximum possible score, 18). On this sub-
domain which assesses gross motor skills (e.g., body balance,
walking, running) there was no significant difference between
the scores of the integrated and segregated groups of chil-
dren on the pretest scores, $U(7, 9) = 23.5, p > .10$. Two
children in the integrated group and one child in the segre-
gated group achieved a pretest score of 18; six children
(two, integrated; four, segregated) obtained posttest scores
of 18.

Expression (maximum possible score, 22). Articulation, and
both verbal and written expression are covered in this sub-
domain. No significant difference was noted between the
scores of the children in the integrated programme and those
of the children in the segregated setting $U(7, 9) = 17,$
$p > .10$ on the pretest scores.
Changes in pre- and posttest scores (i.e., improvement) scores were calculated for each child and overall improvement of the integrated and segregated groups compared. There was no significant improvement, \( U(7, 8) = 11, p > .01 \), in one group over the other (i.e., between the two groups).

**Comprehension (maximum possible score, 9).** This subdomain refers to both oral and written comprehension. Pretest score differences between the integrated and segregated groups, were not significant, \( U(7, 9) = 29, p > .05 \).

All the children in the integrated group received higher (i.e., better scores) on the posttesting and the group as a whole improved more than the segregated group (i.e., had significantly higher posttest than pretest scores), \( U(7, 8) = 4.5, p < .003 \).

**Social Language (maximum possible score, 8).** This subdomain includes items under a miscellaneous section and another section dealing mainly with etiquette. A comparison of pretest scores between the integrated and segregated children did not yield any significant difference between the two groups \( U(7, 9) = 23, p > .10 \). There was also no significant improvement (i.e., pre-posttest score change) of one group over the other \( U(7, 8) = 16.5, p > .01 \).
Numbers and Time (maximum possible score, 12). Children in the integrated setting and children in the segregated setting did not differ significantly in their pretest scores when the groups were compared $U(7, 9) = 33, p > .10$. Unfortunately no posttest scores were available for the integrated group.

Initiative (maximum possible score, 9). During the pretesting 7 of the 16 children assessed (four integrated, 3 segregated) obtained the highest score possible. Thus, other than obtaining means and standard deviations (Table 8) on the two sets of scores for the two groups no analyses were carried out.

Perseverence (maximum possible score, 8). Included in this subdomain are the two sections, Attention and Persistence. Three of the 16 children (1 integrated, 2 segregated) assessed obtained the maximum score possible on the pretest. There was no significant difference in the scores of the children in the integrated programme and those in the segregated programme $U(7, 9) = 24.5, p > .10$. No between group comparison was made in the pre-posttest change scores because posttest scores were not available on five of the nine children in the segregated group.

Responsibility (maximum possible score, 6). This subdomain assesses the individual's ability to look after his/her personal belongings and their dependability in carrying out
assigned tasks. No significant difference between the integrated and segregated groups was found $U(7, 9) = 26.5$, $p > .10$. Posttest scores were available for only 6 of the 9 segregated children. An analysis of pre-posttest change scores (i.e., indicating improvement in this area) yielded a significant difference in the improvement of the scores of the segregated children over that of the integrated children $U(7, 6) = 5$, $p < .01$.

Socialization (maximum score possible, 26). Areas tapped by this domain include: cooperation, consideration and awareness of others, participation in group activities, and selfishness. The integrated and segregated groups did not differ from each other on the pretest scores $U(7, 9) = 20$, $p > .10$. Posttest scores were available on only one child in the segregated group.

Adaptive Behaviour Scale (ABS) -- Part Two

Posttest scores were not available for children in the segregated group. Table 8 contains the means and standard deviations of pretest raw scores. Point biserial coefficients were calculated for Part Two pretest scores and school placements. These are reported in Table 9. None of the correlations were significant according to $t$ tests. However, further analyses using Mann-Whitney $U$ tests demonstrated a significant difference in the subtest scores between the integrated and
segregated groups on the Stereotyped Behaviour and Odd Mannerisms domain \((u (7, 9) = 9, p < .05.\) On this subdomain the scores indicated that the children in the segregated setting had significantly more problem behaviours than did the integrated children in these areas.
Table 8

Means and Standard Deviations of 1982 Part Two ABS Scores (raw) for Children in Integrated or Segregated Settings

<table>
<thead>
<tr>
<th>Subdomain</th>
<th>Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Integration</td>
</tr>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>Violent and Destructive Behaviour</td>
<td>3.71</td>
</tr>
<tr>
<td>Antisocial Behaviour</td>
<td>7.86</td>
</tr>
<tr>
<td>Rebellious Behaviour</td>
<td>5.14</td>
</tr>
<tr>
<td>Untrustworthy Behaviour</td>
<td>1.86</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>1.28</td>
</tr>
<tr>
<td>Stereotyped Behaviour and Odd Mannerisms</td>
<td>.14</td>
</tr>
<tr>
<td>Inappropriate Interpersonal</td>
<td></td>
</tr>
<tr>
<td>Manners</td>
<td>1.28</td>
</tr>
<tr>
<td>Inacceptable Vocal Habits</td>
<td>2.71</td>
</tr>
<tr>
<td>Hyperactive Tendencies</td>
<td>.57</td>
</tr>
<tr>
<td>Psychological Disturbances</td>
<td>7.28</td>
</tr>
</tbody>
</table>

<sup>a</sup>n = 7, integrated group; n = 9 segregated group
Table 9

Point Biserial Coefficients between 1982 ABS Part Two Scores (raw) and School Placement

<table>
<thead>
<tr>
<th>Domain</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violent and Destructive Behaviour</td>
<td>-.04</td>
</tr>
<tr>
<td>Antisocial Behaviour</td>
<td>-.05&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Rebellious Behaviour</td>
<td>-.12</td>
</tr>
<tr>
<td>Untrustworthy Behaviour</td>
<td>.11</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>-.30</td>
</tr>
<tr>
<td>Stereotyped Behaviour and Odd Mannerisms</td>
<td>-.49</td>
</tr>
<tr>
<td>Inappropriate Interpersonal Manners</td>
<td>.49</td>
</tr>
<tr>
<td>Unacceptable Vocal Habits</td>
<td>.25</td>
</tr>
<tr>
<td>Unacceptable or Eccentric Habits</td>
<td>-.01</td>
</tr>
<tr>
<td>Hyperactive Tendencies</td>
<td>-.40</td>
</tr>
<tr>
<td>Psychological Disturbances</td>
<td>-.03</td>
</tr>
</tbody>
</table>

Note. n = 7, integrated group; n = 9 segregated group
CHAPTER IV
Discussion

The present study was a follow-up to an earlier investigation (Orr, 1983) involving trainable mentally retarded children attending an integrated or segregated school setting. The purpose was to retest these children on several of the measures which had been employed in 1982, examine changes in pre-posttest scores, and compare the progress of the children in the integrated programme to that of the children in the segregated school programme.

For the most part, children in both programmes improved their scores between the first and second testings. In terms of academic test scores (i.e., WRAT: Reading, Spelling, and Arithmetic) the children in one setting did not improve more than did the children in the other setting (i.e., school placement was not a factor in the pre-posttest change score). However, according to Mann-Whitney U tests, children in the integrated programme made significantly greater gains than did those in the segregated programme on: the sum of the WISC-R Verbal subtests, and WISC-R and ABS Comprehension subtests. The children in the segregated programme made slightly greater gains on the PPVT-R than did the integrated children. No differences were found on the pretest scores between the integrated and segregated groups with the except-
ion of ABS Part Two Subdomain, Stereotyped Behaviour and Odd Mannerisms. On this subdomain the segregated children received higher scores (indicating more problems in these behaviours) than the integrated children received. The following elaborates on these findings.

Interestingly, on one test of verbal abilities (i.e., PPVT-R), the segregated children improved more than the integrated children, whereas on other tests tapping verbal skills (WISC-R, ABS) the integrated children improved more than the segregated children. One factor in this apparent discrepancy may be related to the fact that the children in the segregated programme had more access to speech/language services (i.e., speech pathologist and correctionists) than did the integrated children. One tool used in speech/language therapy is the Peabody Language Development Kit; more exposure to these materials by the segregated group may have contributed to their greater improvement on PPVT-R scores.

A further explanation for different rates of improvements by the two groups on verbal tests may relate to the test demands. Requirements on the WISC-R and PPVT-R are quite different; the former requires verbal expressive language, whereas, the latter demands only a pointing response from the child. The expressive abilities of the integrated group were thought by school personnel to be superior to the segregated group when the children were first placed in their respective school programmes. Thus, the greater improvement
of the integrated children on the WISC-R Verbal items may reflect their initial strength in that area. The responses of several children in the segregated group were very difficult to understand; this may have resulted in their receiving lowerbound scores on the WISC-R.

With regard to individual WISC-R Verbal subtests, the posttest mean raw score of each subtest was greater for the integration group than for the segregation group. The pre-posttest change in scores for each subtest was greater (or in one case the same) for the integration group and significantly greater on the Comprehension subtest. This subtest taps the ability to solve simple social and practical problems and requires a verbal response from the child (usually a word string and not a single word). The children in the integrated programme would appear to have more opportunity to be involved in more extended social situations through recess, lunch hour, and other involvement with normal children. These interactions may have contributed to their strength relative to the segregation group in this area.

This improvement in WISC-R Comprehension subtest scores by the integrated group was supported by the same type of improvement on the ABS Comprehension subdomain.

The other item on which there was a significant improvement of one group over the other was the Responsibility subdomain of the ABS. Here, the segregated children made more improvements than the integrated children made. This subdomain
involves the ability to care for personal belongings and carry out assigned tasks. The segregated children were in a more protected school environment with all the staff aware of the limitations of trainable mentally retarded children. The restrictions and protection of the segregated environment may have been what made the segregated children appear more responsible.

Interestingly, the ABS Part Two Subdomain scores did not generally support the differences in the children's behaviour in the two placements which would have been expected given the eligibility criteria outlined by the school board. In other words, there were no differences in the integrated and segregated children's behaviour on subdomains such as: Violent and Destructive Behaviour, Rebellious Behaviour, and Psychological Disturbances even though children with a history aggressive, disturbing behaviour were ineligible for the integrated programme.

In retrospect, the WISC-R was not the most appropriate intelligence test to use with trainable mentally retarded children of this age. On several of the subtests even the initial items were too difficult for most of the children to answer correctly. For example, in 1984 9 of the 16 children received a raw score of zero on the Similarities subtest. Another test, such as the Stanford-Binet Intelligence Scale, which has a lower floor, would have allowed for a more accurate reflection of the children's strengths and weaknesses and made the comparisons more precise.
Unfortunately, due to constraints imposed by the school board involved, it was not possible to have direct contact with the children's parents. It would have been most interesting to hear their views on their children's school placement, particularly those whose children had moved from the segregated setting to the integrated setting at the onset of the study.

Another limitation, related to the initial phase of the study, was that the pretesting was not carried out just prior to the children's placement in one of the two settings. Again, this was not possible to control for because school board personnel conducted the assessments. Nevertheless, given the baseline data collected in the spring of 1982, it was possible to follow up the children and compare their progress in the two different placements.

As to what setting provides more opportunities for the children, there is no definitive statement forthcoming. Regarding academic achievement, as measured by the WRAT, there was no difference in the progress of the children in one programme over that of the children in another programme (i.e., the experimental integration programme was not detrimental to the children in this respect). All the children, regardless of their school placement, were very limited in their academic skills; all percentile scores fell at 2 or below. This was not unexpected given the literature on trainable children. For example, Dunn (1963) states that
"trainable children ... are not likely to acquire sufficient skills in the three R's to operate at the grade four level and beyond, which is the standard for literacy. They are noneducable in the academic sense" (p. 130).

Kern and Pfaeffle (1962) suggest that, given the academic limitations experienced by these children, focus on other aspects of behaviour, keeping in mind long range goals, is important. In accordance with several other authors (Wilton and Densm, 1977) they believe social skills and behaviour should be the targeted area of development. The present study suggests that the integrated programme is most conducive to enhancing these skills.

Since these children were first integrated into the suburban school in 1982 other integrated placements for trainable children have been established in the community. These include preschool programmes and, as Wilton and Densm (1977) point out, "preschool years are a critical period of social and cognitive development" (p. 165). Given this trend toward integration at the preschool level, the present findings warrant continuing with integration at least through the elementary years.

Of course, this recommendation is predicated on the fact that the receiving schools and community are adequately prepared through training programmes and public relations work to receive the trainable children. Again as Schwartz (1977) strongly states, these are exceptional children and
have needs for support above and beyond their non-handicapped peers. It makes no sense, in providing them with integrated placements, to withdraw the specialized services (e.g., speech/language therapy, specially trained teachers, etc.) that were available in the segregated setting.

In summary, for the most part, children in both the integrated and segregated programmes made progress in the areas assessed. The experimental (i.e., satellite) programme was not detrimental to the children's academic progress. However, the integrated children's change (i.e., improvement) on pre-posttest scores was slightly behind their segregated counterparts' improvement on receptive language skills, as measured by the PPVT-R. On the other hand, on tests of comprehension (knowledge of social and practical situations) the integrated children made more progress than the segregated children made. Thus, based on the present data, it was concluded that the experimental programme was not detrimental to the children's progress, rather it enhanced the development of their social adaptive behaviour.
REFERENCES


Public Law 94-142. (1975). Education for All Handicapped Children—Act, USC.


APPENDIX

Description of Integrated and Segregated Settings

SEGREGATED SETTING

The school referred to as the segregated setting was situated in an older part of the city. It was a building unto itself (i.e., not connected to another school). Originally built as a vocational school for girls, at the time of the present assessment its sole purpose was to provide education to the trainable mentally retarded. The building had an auditorium/gymnasium, home economics and shop facilities as well as 14 bright, attractive classrooms.

There were 130 children, ranging in age from 5 to 21 years, attending the school. In addition to the special education teachers, a support staff of teacher aides, speech/language pathologists, and Mental Retardation Counsellors was available; a psychologist, psychometrist and social worker provided services on a part-time basis.

INTEGRATED SETTING

The Satellite (integrated) programme was housed in a suburban elementary school. The two classes of trainable mentally retarded children attended a large room where the teachers worked together in an open concept fashion. Support services similar to those provided in the segregated school were also available to these children.
The trainable mentally retarded children shared the same recess and lunch hour as did the other children attending the school; they also attended school assemblies. A few of the children participated in regular art, music and/or library classes with the other children.
VITA AUCTORIS

Helen Elaine Martin was born in Ottawa, Ontario on November 4, 1943. She received a Bachelor of Arts Degree (Major, Psychology) from Carleton University in 1965. She continued her studies at Ottawa Teachers' College and was granted an Ontario Elementary School Permanent Teaching Certificate in 1968. In 1982, she received the degree of Bachelor of Arts (Honours Psychology) from the University of Windsor.