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A STUDY OF THE EFFECT OF INTERDISCIPLINARY COMMUNICATION ON ATTITUDES OF EDUCATORS TOWARD CHILDREN WITH MYELODYSPLASIA

by
Marjorie Catherine Becker

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in
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ABSTRACT

A STUDY OF THE EFFECT OF INTERDISCIPLINARY COMMUNICATION ON ATTITUDES OF EDUCATORS TOWARD CHILDREN WITH MYELODYSPLASIA

by
Marjorie Catherine Becker

Chairman: Geraldine T. Scholl

The primary purpose of this study was to determine to what extent written communication is effective in establishing a meaningful link between the educational and medical communities dealing with myelodysplastic children, increasing the information level of the various persons involved, and thereby positively changing the attitudes of educators toward these children.

The hypotheses tested were:

1. A positive change in attitudes of teachers, principals, special education directors, physical therapists, and occupational therapists, in that order, results when frequent, educationally oriented written communication is initiated by a medically-centered pediatric rehabilitation team and shared with these educators.

2. There is a positive relationship between the attitudes of educators and a myelodysplastic child's intelligence, as measured by the Stanford-Binet Form L-M Intelligence Scale, and social maturity, as measured by the Vineland Social Maturity Scale; there is a negative relationship between these same attitudes and chronological age of the child and severity of physical disability as measured by The Assessment of Physical Disability from Rehabilitation Codes.

The subjects were 143 educators dealing with 58 myelodysplastic children in school settings throughout Michigan. The children were matched on the basis of chronological age, sex, and intelligence. The educators were

divided into experimental and control groups on the basis of the matched pairs of children randomly assigned as experimental or control in each pair.

The Attitude Toward Disabled Persons Scale was used as the instrument for measuring attitude score changes in the educators after the experimental group received frequent educationally oriented written information regarding myelodysplastic children over a period of one school semester.

The principal findings were:

1. The various educators concerned with myelodysplastic children demonstrated attitudes which were neither strongly positive nor strongly negative; these attitudes in the experimental group were not significantly changed when attempts were made to increase their information level.

2. There was no relationship between the attitude scores of the various educators by role.

3. Of the various roles represented, special education directors demonstrated the most significant change in attitude scores followed by principals, teachers, and therapists in that order but of magnitudes which did not approach significance.

4. There was a significant correlation between the attitudes of teachers and the amount of contact they had with myelodysplastic children.

5. Educators having the most face-to-face contact with myelodysplastic children (teachers and principals) had attitudes regarding these children which were positively related to intelligence and social maturity, and negatively related to the severity of physical disability.

6. There were positive intercorrelations between the IQ, SQ, presence of hydrocephalus, and ambulation status, and a negative intercorrelation with the severity of disability of myelodysplastic children.

The results of this study did not give support to the use of the present method for establishing a two-way communication system between the medical community and school personnel indicating that other methods should be explored to accomplish this objective and incorporate the educators of myelodysplastic children into the habilitation team.

A variety of school settings were represented in this study but little mobility of children existed within the special education programs. There was evidence supporting the effectiveness of pre-school programs for the physically handicapped.

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CHAPTER I

INTRODUCTION

Medical advances in recent years are contributing to an increasing population of certain multihandicapped children (Beal, 1967; Merrill, 1962). Appropriate educational programming for such children is complicated by current practices in special education. State and local programs tend to be primarily concerned with single disability categories which do not take into consideration a child having two or more disabilities. There is growing support for maximal integration of handicapped children into regular classrooms with their special needs met by itinerant personnel. Illustrative of the multihandicapped for whom such program development presents problems are children born with spina bifida and an associated myelomeningocele. These congenital malformations and their secondary defects are frequently referred to as myelodysplasia.

The incidence of spina bifida remains relatively constant at about three per 1,000 births (Record and McKeown, 1949). The incidence of the most severe form of spina bifida with the spinal cord herniated through the defect forming a visible sac or myelomeningocele is reported as 7.1 to 9.2 per 10,000 live births (Beal, 1967; McIntosh and Mellin, 1956). It is this group of children whose life expectancy has been significantly increased by medical advances within the last ten years and who are now being enrolled in school programs. Myelodysplastic children may have associated hydrocephalus as well as urologic and neurologic

deficits to varying degrees contributing to retardation in intellectual and motor areas. Mobility is quite often possible with the use of braces, crutches, or a wheelchair.

Many medical and paramedical personnel are involved in the habilitation of children with myelodysplasia. Comprehensive care, an outgrowth of the "team approach," is accepted in medicine as the most efficient and effective method of assuring habilitation success. In the pediatric age groups, however, the habilitation process requires special awareness and continuity in the psycho-social, vocational, and educational services rendered. At the present time few medical centers routinely provide a full compliment of pediatric habilitation services by a single group of persons assigned full time to such activities. In the absence of such a team approach, comprehensive and continuing communication, particularly with educators regarding the educational implications of a child's medical disabilities, is usually difficult or absent. In the cases of multihandicapped children requiring multiple habilitation services, school personnel need to be involved very early in the medical habilitation process so that appropriate educational evaluation, planning, and placement are not delayed or omitted.

Multihandicapped children in general and myelodysplastic children in particular present a frustrating problem to educators by virtue of their multiple impairments. They do not fit neatly into the present special education categorical structure; they may present many learning problems; and they may present physical management problems by virtue of their motor impairment and urinary incontinence. Their multitude of problems makes it essential that educators have positive attitudes toward these children in order to implement successful educational programs.

There are several parameters of importance in the formation and modification of attitudes held by educators toward myelodysplastic students. Contemporary society relates physical appearance to expected behavior in the disabled and attitudes are often based on these relationships (Barker, Wright, Meyerson, and Gonick, 1953; Winkler, 1931; Wright, 1960). Examples are, aesthetic aversion to visible impairments and the generalization that disability implies limitations in all areas of function (Siller, 1967). Non-disabled persons do not fully understand the physical limitations imposed by a disability and tend to exaggerate the restrictions. Ladieu, Adler, and Dembo (1948) suggest a spread effect from what is visible connoting unworthiness to complete acceptance. Thus, behavior of the disabled as it appears to the non-disabled further contributes to attitude formation. Secondly, many of the disabled see themselves negatively (Smits, 1964) as second-rate members of a minority group whose physical and social contributions are questionable when compared to the non-disabled (Barker, et al., 1953; Ladieu, et al., 1948) and perform accordingly. The adjustment patterns and behavior of disabled children are influenced by attitudes of parents (Barsch, 1964; Cook, 1963) and also by attitudes of non-disabled siblings and peers (Billings, 1963; Clark, 1964; Force, 1956; Jaffee, 1966; Soldwedel and Terrill, 1957), which in turn influence attitudes held by educators coming into contact with these children. There is past evidence to support the assumption that attitudes of teachers strongly influence the attitudes and behavior of their students. Thus, attitude modification of educators toward more realistic acceptance of myelodysplastic children may influence these children toward more realistic achievement and acceptance of themselves

(Haring, Stern, Cruickshank, 1958) which is a primary goal of both regular and special education.

Many methods of attitude modification have been attempted with teachers including films, group discussions, visitations, lectures, reading materials, or any combination of these. Although some earlier researchers (Binnewies, 1931; Cherrington and Miller, 1933; Ford, 1949) found one method more effective than another, the evidence is not conclusive enough to permit singling out one method as best for all situations. Most research indicates that the use of instruction in some form or another as the most effective means of attitude modification (Haring, et al., 1958). It is assumed that attitudes of educators can be modified in a positive direction by providing instructional communications with the hope of increasing the informational level regarding a specific group of handicapped children having little physical attractiveness and multiple physical and mental impairments.

Attitudes of educators toward myelodysplastic and other physically disabled students may be influenced by the attitudes of society at large, families of disabled students, non-disabled students, and the behavior expressed by myelodysplastic children themselves either consciously or unconsciously. Further, there is evidence that attitudes may be positively modified by increasing the information level. Therefore, if increasing numbers of myelodysplastic children are to be accepted in school, increasing the information level of educators toward them becomes an essential element in the habilitation process.

CHAPTER II

RELATED RESEARCH

Although myelodysplastic children have not as yet been identified as a disability group in the literature, the multiplicity of neuro-musculoskeletal problems suggests a possible comparison with other multi-handicapped groups such as cerebral palsy. Absolute comparisons between groups in the realm of attitudes cannot be assumed since the evidence does not support the complete generalization of attitudes across disabilities. For example, the Whiteman and Lukoff (1965) study identified six major components of attitudes toward blindness (emotional attributes, competence, personal interaction, community interaction, non-protectiveness, and conception of disability). When 32 of 97 New York University first-year social work students were given a questionnnaire incorporating these components but in reference to the generic term physical disability, these six bases for attitudes toward blindness did not hold strongly relative to physical disability in general. "Blindness" was seen by these young adults as more severe than "physical disability" even though there was a tendency to evaluate the traits of blind and physically disab led people similarly; thus, the focus was on the specific disability rather than the person. Whiteman's subjects were young and professionally inexperienced. Perhaps experienced teachers do focus on individuals rather than disabilities which would allow for greater generalization of attitudes across disabilities.

With another young college sample, Guskin (1963) tried to determine whether attitudes toward an atypical person are similarly stereotyped or are different as to deviant type. Ten pictures labeled normal child, feebleminded, grossly mentally deficient, educationally inadequate, autistic, emotionally disturbed, unpopular, delinquent, low social class, and physically disabled were used in 45 combinations. Subjects were asked to score the degree of difference on a nine point scale, zero being not different and nine being extremely different. All of the deviant types were labeled similarly and different from the normal. The physically handicapped were seen as less deviant from normal than the retarded and this deviancy was based on behavioral differences. The marked subnormal was described as being more deviant in his behavior than the physically disabled but no common dimension of judging deviancy across impairments was identified.

The physical appearance, variation in functional limitations, incidence of intellectual impairment, and educational needs of myelodysplastic children appear more like those of the cerebral palsied than any other categorical group and it is assumed that attitudes toward both of these groups would be similar. Thus, research on attitudes and attitude modification of the general public, educators, and disabled children toward the cerebral palsied was reviewed as well as the literature concerned with attitudes toward other multihandicapped children.

General Attitudes Toward the Disabled

Barker, et al. (1953), Meyerson (1948), and Wright (1960) made general surveys of attitudes held by non-disabled persons toward the disabled. Barker concluded that the public verbalized attitude toward

physical disability is mildly favorable; a minority expresses negative attitudes; and indirect evidence suggests that deeper, unverbalized attitudes are frequently more hostile. Winkler (1931, cited in Barker, et al., 1953) showed 200 normal subjects a series of action pictures of normal and crippled children with no indication that any were abnormal. Each picture was to be judged with respect to character and personality traits. Unfavorable judgments of the crippled children who were not recognized as such exceeded unfavorable judgments of normal children (60 per cent as compared with 46 per cent of all judgments) suggesting the postures of the crippled children, although not deviant enough to be recognized as crippled, served as a stimulus for unconscious negative reaction. Thus, Winkler concluded that crippled people with these unusual postures and movements serve as a strange, disturbing, emotional stimulus arousing suspicion and aversion in a normal individual and mitigating against the establishment of empathic relationships between disabled and non-disabled persons.

Wright (1960) detailed a series of case summaries in somatopsychological terms and again emphasizes negative or repulsive reactions aroused in normal persons when confronted by severe physical disability. Society at large is unable to evaluate the extent of a given disability by observation. Thus, the tendency is to see a disabled person "as if" he were totally impaired and devoid of a social, vocational, or economic contribution. Wright attributes this attitude to our cultural emphasis on good health, physical prowess, and appearance.

Robbins (1962) explored the anxieties which people have about illness by interviewing 46 Maryland housewives and determining their perceptions of cancer, heart disease, polio, tuberculosis, mental illness,

and colds. Physical disabilities did not arouse great concern unless they existed within the housewife's family and she had personal contact with them. Anxiety was greater regarding cancer than with chronic disabilities. This study suggests that lack of knowledge or avoidance of the disabled lessens concern about them, and a rather neutral attitude is expressed. This would be especially true of housewives who are undoubtedly more concerned with cancer considering the current interest in cancer as opposed to physical disability.

Although many studies of attitudes toward disabilities have been restricted to a general acceptance-rejection of handicaps or to a specific disability, especially blindness, there are a few which compare reactions to different disabilities using disability ranking methods with populations of normal adults, normal children, and disabled children. Most of the conclusions support Wright's (1960) generalizations regarding the repulsion of the disabled, minority status, poor self-concept, and greater dislike of more severe management problems.

Richardson, et al. (1961) divided 640 disabled and non-disabled ten- and eleven-year-old male and female summer campers into six sets. The campers represented various cultures, socio-economic backgrounds, races, and urban-rural settings. Across sets and within sets there was uniform preferential ranking of pictures of physically disabled children unaffected by rater characteristics. The consistent order of preference ($p < .001$) was a child with no handicap; a child with braces and crutches; a child in a wheelchair with his legs covered with a blanket; a child with his left hand missing; a child with facial disfigurement; and an obese child. The girls tended to rank the social disabilities (obesity and facial disfigurement) higher than did the boys. Since the disabled campers rated the disabilities no differently than the non-disabled,

Richardson, et al., (1961) felt these findings supported the idea that a minority culture (the disabled) assimilates the values of the majority culture. It must be remembered that probably none of these campers was severely handicapped since the setting was a large summer camp and the disabled population was required to manage their own physical needs.

Goodman, Dorenbusch, and Richardson (1963) replicated Richardson's (1961) study and found that adult rehabilitation workers held the same preference patterns toward disabilities as the children, while children from subcultures with different values and attitudes (Jewish and Italian) varied in a predicted way. Mentally retarded and emotionally disturbed children responded much differently than the normative groups. In addition to showing a preference for less severe disabilities, the major conclusion from these two studies was that cultural uniformities, which are not explicitly taught, significantly affect how children rank pictures of disabilities. These uniformities are contingent upon (1) the child's exposure to the value, and (2) the child's ability to learn the value.

Contrary to Richardson's (1961) findings, Dow (1964) in replicating the procedure with 58 physically disabled children found that 70 per cent of the disabled respondents preferred the disabled pictures over the normal ones or indicated no preference. In Dow's (1964) study the subjects were not forced to rank order but to indicate preferences between two pictures which may account for the differences reported in these two studies.

Siller (1967) obtained a preferential ranking using a Feeling Check List (FCL) and then administered the Social Distance Scale (SDS) to a high school and college population (N=394). Rank order correlations between these two instruments was only .57, indicating a moderate relationship between reported feelings toward and social acceptance of

various disabilities. On the FCL and SDS blindness and deafness ranked highest in acceptance. Musculoskeletal defects (disabilities causing physical alterations) ranked next, with skin disorders least acceptable on the FCL. Interestingly, on the SDS or true social acceptance, skin disorders ranked in fourth position with paralysis, cerebral palsy, muscular dystrophy, and other orthopedic alterations following. Thus, verbalized attitudes and social action may be discrepant as demonstrated by Wright (1960). This is a prevalent point of view especially among younger people who place high value on physical appearance (Siller, 1967). Although the more educationally limiting disabilities of blindness and deafness were seen as less repulsive to this young population, teachers may hold a different point of view.

Attitudes of Educators Toward the Disabled

Attitudes held by classroom teachers toward the handicapped have been related to (1) labeling of children (Combs and Harper, 1967; Kingsley, 1967; Semmel, 1966; Want, 1952); (2) knowledge of the various disabilities (Fine, 1967; Warren and Turner, 1966); (3) general teaching experience (Robinowitz and Rosenbaum, 1960; Want, 1952); (4) teacher adjustment (Billings, 1963); (5) contact with the disabled (Barsch, 1964; Haring, et al., 1958; Semmel, 1966); and (6) ease of management (Barsch, 1964). Undoubtedly all of these factors are operating in teacher attitude formation.

Labeling disabilities and teaching experiences with the disabled have been the variables most often investigated. Almost all investigations in these areas have indicated that increased familiarity with a disability yields increased positive attitudes. Kingsley (1967) asked 223 undergraduate education majors to identify and describe exceptionality. Most

respondents defined exceptionality in terms of intelligence. Little knowledge was expressed with reference to disability categories common in special education.

Labeling studies suggest that sub-grouping disabilities into the current medical model in special education does evoke more negative attitudes in teachers than when disabled children are discussed as a total group. Only the mentally retarded are seen as negative whether labeled or unlabeled (Combs and Harper, 1967). This finding lends support to the idea that behavioral differences evoke greater negativism than physical differences.

The kind or amount of teaching experience does not seem to play a part in the attitude response. The degree of positiveness or negativeness of teacher attitudes remains rather constant even though there is greater homogeneity of attitudes (Want, 1952) and perhaps a little more restrictiveness (Robinowitz and Rosenbaum, 1960) with increased teaching experience.

Semmel (1966) explored labeling responses in references to connotative versus denotative meanings attached to various children. He used a connotative response inventory with 457 college freshmen and senior majors in elementary and special education. A social situation was described and a label attached to persons involved, and then social distance was scored. A summary of pertinent findings indicate:

1) A difference ($p<.01$) in connotative reactions toward disability labels with cerebral palsy, mental retardation, epileptic, normal Negro, blind and deaf, stutterer, and normal white ranked least to most accepted.

2) Differences in responses to labels as a function of descriptions in social-psychological contexts, i.e. items suggesting permanency in

interaction were seen as less favorable as compared to distant or short-lived interactions.

3) No difference in mean scores between students with and without a basic introduction to exceptional children course.

At a 1965 special education summer workshop, Mader (1967) gathered data on several scales including the Attitude Toward Disabled Persons (ATDP) and found a significant relationship ($p < .01$) between positive attitudes of educators and (1) their degree of contact with disabled children; (2) satisfaction or enjoyment associated with their job position; and (3) the ease with which the educators could avoid what they felt was dissatisfying or frustrating about their job.

Examples are given for job frustration as a basis for teacher attitudes by Major (1961) and Barsch (1964). Each states that professionals with experience may unconsciously use ease of handling disabled children as a criterion for acceptance so that the more severely or multiply involved children (especially cerebral palsied) are regarded more negatively. In addition, while teacher preparation is extensive, it does not always include efficient techniques for managing the severely involved child so that "teachers may feel that their enterprise is being disrupted by a seeming misfit" (Major, 1961, p. 330). Major (1961) also emphasized the point that even though teachers are well prepared in special education, they need resources to which they can turn. Researchers would do well to assist in building a repertoire of such resources to assist teachers with particular children in particular settings.

The most extensive analysis of educator attitudes was done by Haring, et al. (1958) who tried to determine the extent to which attitudes of classroom teachers can be modified toward greater and more

realistic acceptance of exceptional children and attempted to modify the initial attitudes of these teachers in this direction by the use of a workshop. Fifteen workshop sessions, two hours each, were provided regular classroom teachers and administrators from four schools in and around Syracuse, New York. Eight aspects of exceptionality were covered; intellectual retardation, orthopedic and neurological impairments, hearing and/or speech impairments, gifted, emotionally disturbed, visual impairments, and parent counselling. Pre- and post-workshop inventories were administered and matched-pair t tests applied for significant changes in acceptance. Significant gains were made in acceptance but not in realistic classroom placement with the greatest discrepancy in placing children requiring special toilet handling. Only minor personality changes were noted in the workshop participants as measured by the Activities Index and the Picture Judgment Test; classroom teaching habits were changed very little in classes for orthopedically and neurologically impaired as measured by a Critical Incident Technique.

Haring's, et al. (1958) findings adequately summarized the assessment of information level, the result of purposeful instruction to educators, and areas of effective modification:

1) The teachers from all four schools increased significantly in information about exceptional children as a result of the workshop. However, having experiences with exceptional children did not have a systematic influence upon the amount of increase that the teachers showed on the information level.

2) As a total group, the teachers demonstrated significant increases in acceptance of the children in the areas of exceptionality considered. The teachers from the two schools having relatively large numbers of exceptional children increased in acceptance for a substantial

number of areas of deviation, whereas the two schools with a few exceptional children showed very slight increases.

3) The teachers were able to modify their attitudes for some areas of exceptionality more readily than others. The significant differences between the areas of deviation were a function of the teacher's initial acceptance in the area and the number of experiences with exceptional children in the area. There were no significant differences between the three degrees of involvement within the areas of deviation.

4) The teachers did not show marked increases in their ability to become more realistic concerning the accurate placement of exceptional children. The significant increases that were demonstrated in realistic placement for some areas were offset by significant decreases in others.

5) The personality structure of the teachers as a total group did not change as a result of the workshop. Analysis of the minimal changes which did occur indicated a resistance on the part of the teachers to the workshop experience.

6) The teachers became significantly more positive in their responses to handicapped children. As a group they did not become more positive toward themselves, their own adjustment, or toward other individuals.

7) Each of the four schools changed in their own characteristic way on all of the instruments used for assessment. There were no consistent patterns of change among the teachers throughout the four schools; however, the changes shown by the two schools having relatively large numbers of exceptional children were closely related.

8) The teachers reported a substantial number of changes in instructional techniques and methods, classroom practices, and other

relationships with exceptional children as a result of the workshop experience. This evidence was used to suggest that the gains found on the General Information Inventory and the Classroom Integration Inventory were incorporated into the teachers' behavior relative to exceptional children.

9) Evidence revealed through a subjective analysis of the tape recordings from the discussion groups indicated that the results on the Activities Index were valid.

Attitudes of Disabled Children Toward the Disabled

Disabled children hold attitudes toward themselves based primarily on the degree of physical and social restrictions imposed by the disability (Richardson, 1964). Social restrictiveness and poor social adjustment due to disability is supported by Cruickshank (1951). He found a significant difference in fear and guilt feelings between physically handicapped and matched normals. This difference contributes to poorer social adjustment of the disabled and may account for lower self-concepts.

Smits (1964) found the mean scores on a self-concept test to be inversely related to the degree of disability in 125 male and 75 female junior and senior high school students ($p < .05$). Severely disabled girls scored lower in self-concept on the Index of Adjustment and Values than did equally disabled boys. Also of interest, though not statistically significant, was the lower rating of boys than girls by teachers, regardless of disability.

In a group of mentally retarded junior high students Mayer (1966) found no significant difference in the self-concepts of three groups who were placed in special classes early in their school experience, midway, or late. This refutes the idea that heterogenous grouping enhances self-concept at least in the retarded.

In brief, in a culture where distinctions are made on the basis of age, sex, race, stature, and appearance, a disabled person will behave according to his evaluation of these criteria with regard to his own appearance (Barker, 1953). Thus, a wide range of adjustments are possible in the disabled but evidence suggests an inverse relationship between normal psycho-social adjustment and severity of disability.

Attitudes of Peers Toward the Disabled

In addition to general attitudes held toward disability by both disabled and non-disabled, a variety of sociometric techniques have been used in classrooms to determine children's attitudes toward their peers which must exert some influence on the attitudes of teachers (Billings, 1963; Clark, 1964; Force, 1956; Jaffee, 1966; Soldwedel and Terrill, 1957). Common findings with the first through the eighth grades were:

1) Classroom seating arrangement was not a factor.

2) The physically handicapped are not as well accepted as friends, playmates, or workmates.

3) Disabilities have varying social values with cerebral palsy being very low.

4) Attitudes are a function of the social and emotional adjustment of the children holding the attitude.

5) Children perceive and describe disabled peers in terms of their stimulus value and this value changes from child to child.

6) Behaviorial deviations are devalued.

Formation of Attitudes

Many investigators have studied other bases of attitudes toward disability and resulting behaviors. Gellman (1959) postulated that the

roots of prejudice toward the handicapped in our society are attributable to: (1) social customs and norms; (2) child-rearing practices stressing normalcy and health; (3) the recrudescence of neurotic childhood fears in frustrating or anxiety provoking situations; as well as (4) discriminatory provoking behavior by the disabled.

Chesler (1965) investigated ethnocentrism as a basis for attitudes toward the disabled. He hypothesized and demonstrated that a person who expressed ethnocentrism toward one group would do so toward other groups and those highly rejecting minority groups would also reject the physically disabled, thus supporting Wright (1960) and Yuker (1965) who stated the minority status of the disabled evokes attitudes similar to those expressed toward all minority groups.

Using the Secord and Jourard's Body Cathexis Test and a self—made test focusing on interpersonal relationships between handicapped and non-handicapped, Epstein and Shontz (1962) found a relationship, though low, between the attitudes of 49 university undergraduates toward their own bodies and their attitudes toward a disabled person. Those non-disabled students with low body satisfaction responded toward disability with avoidance and rejection; those with high satisfaction responded with approach and acceptance.

Jabin (1965) and Siller (1967) related attitudes toward the physically disabled to personality variables. With a group of adolescents, Jabin (1965) used an attitude scale referring to handicap and crippling around the affective disposition of positive affect, hostility, pity, and repulsion. Some of Jabin's conclusions from her personality correlates and attitudes were that:

1) A person rejects the disabled to the degree to which one's own self-concept is threatened.

2) The intensity of rejection relates to the degree of felt threat and the degree of alienation from interpersonal relationships.

3) Those persons more dependent on the environment for acceptance needs or mobility will tend toward greater attitudes of pity with underlying hostility and repulsion toward the physically handicapped.

4) More alienated persons express more hostility and repulsion, though also harboring attitudes of pity toward the physically handicapped.

Raskin (1956) proposed the importance of psychodynamic, situational, socio-cultural, and historical factors as bases of attitudes of sighted persons toward blindness. Siller (1967) pursued the psychodynamics of attitudes toward disability in general, and hypothesized that ego strength and the attainment of stable object relationships are necessary for non-disturbed (accepting) feelings toward people with disabilities; ego weakness and disturbed object relationships disrupt such acceptance. Attitudes were measured by the Attitude Toward Disabled Persons Scale (ATDP), Feeling Check List (FCL), and Social Distance Scale (SDS). Forty-nine variables in 284 college students and 20 variables in 464 junior and senior high students were collected, inter-correlated, and factor analyzed for each educational level. Many correlations between the ATDP and FCL with other measures were significant yet low. There was consistent uniformity in the way relationships obtained were in the directions hypothesized. Variables such as anxiety and hostility were negatively correlated with acceptance of the disabled while ego strength and nurturance were positively correlated. Neutral and aversive scorers on the FCL reinforced findings of the correlational analyses.

Using interview and projective measures, Siller (1967) also predicted that attitudes toward the disabled are related to: hostility, ego

strength, permeability and impermeability of ego boundaries, general and castration anxiety, and dependency. The only hypothesis receiving support from data collected on 65 non-disabled subjects using interview and projective techniques was the one positing an inverse relationship between permeability of ego boundaries and acceptance of the disabled. Lack of support for the other predictions was partially attributed to the feeling that unidimensional attitude measures are somewhat inadequate.

Several researchers investigated contact with disabled persons as a basis for attitudes. Guttman and Foa (1951) suggested that the intensity of an attitude is related to the amount of social contact one has with the attitude object. Bell (1962) compared the attitudes of rehabilitation employees in a hospital with a group of other hospital employees who had limited contact with the disabled and with a group of employees who had close personal contact with the disabled (a close friend or family member) using the ATDP-Form O. Mean scores for the first two groups were similar and significantly lower than the third group.

Contrary to Bell (1962), Arnholter (1963) and Felty (1965) found significantly higher relationships on the ATDP between accepting attitudes of persons in rehabilitation disciplines and contact with the disabled when compared with various groups in industrial and social settings who dealt with the disabled in varying degrees. These findings indicate that there may be a quality factor in contact as well as a quantity factor.

Siller (1967) described a set of 13 negative and 4 positive components of attitudes toward disability collected from 65 interviews of non-disabled persons which summarized rather concisely and well the variety of attitudes held and the possible bases for them. The categories were derived from a clinical approach but were found to be highly consistent with an

independent study using psychometric measures. Siller (1967) felt that the following components provided a basis for an initial taxonomy of attitudes toward the disabled: functional limitations of the disabled; aesthetic-sexual aversion; strain in social interaction; negative atypicality; attribution of negative qualities; loss of empathic potential; fear it could happen to self; suffering through empathy; fear of burden or responsibility; fear of social ostracism; fear of contagion or inheritance; guilt; specific experience; benevolent attitude; sympathy; and the handicapped seen as human or equal (true empathy).

Attitude Modification

Several studies serve to clarify the requirements for attitude modification. Woodruff and Di Vista (1948) related behavior attitudes to values. They found that value patterns are fairly resistant to change. Therefore, the greatest change in attitudes will occur through changing the concept of the object toward which the attitude is expressed. Consequently, to change behavior toward exceptional children, we must change the concept of these children with regard to their stimulus value. In the Woodruff and Di Vista study (1948), first year psychology students were each given a check list of attitudes, values, and concepts. Intercorrelations of these three variables yielded low correlations of concepts and attitudes except with regard to the value of the concept and high correlation between values and attitudes.

Based on Festinger's theory of cognitive dissonance (1957) Cohen (1959) suggested that the initial attitude of an individual toward a particular group determines the effect of additional experiences with the group, i.e. an initial negative attitude becomes more negative with additional contact. This reaction occurs to avoid "dissonance" within

the individual. This dissonance or low effort to acquire information contrary to a previously held attitude produces resistance. The less the discrepancy between the original attitude and communication content, the greater the attitude change.

Whittaker (1965) postulated a curvilinear relationship between attitude discrepancy and attitude change, i.e. small discrepancies result in small attitude change; moderate discrepancies in the greatest change; and large discrepancies in small positive or large negative attitude change. Attitudes of 109 college undergraduates were determined. A series of _t_ tests confirmed his hypothesis but Whittaker felt the finding that attitude change implies that an attitude was held in the first place was of greater importance. Perhaps his research subjects were really expressing attitude formation rather than attitude modification.

The necessity for a two-way communication system is pointed out by Leavitt and Mueller (1951) who found, in small group research, that one-way communication produces decreased accuracy, confidence, acknowledgement, questions, and greater negative reaction in both the sender and receiver.

The current Civil Rights Movement and changing status of minority races in our country perhaps demonstrates a useful example for the handicapped, also a minority group. Banks (1961) attributes changing attitude toward the Negro in the United States to: (1) social pressure; (2) economic pressure, and (3) religious pressure, with the major mechanism being education of one sort or another. Mere integration as studied by Lombardi (1963) in a Maryland high school did not produce attitude change. Using a test re-test design in studying student attitudes before and after school desegregation and the variables of change, sex, socio-economic level, relgion, intelligence, parent education, personality, change in scholastic average, interest traits, and

class contact with Negroes, no significant correlations resulted except a relationship between a student's attitude and the mother's educational level. Biased attitudes held prior to integration were not changed simply by association with Negro students.

Support has been given to the idea that increased contact with disabled persons produces increased positive attitudes toward them (Chesler, 1965; Yuker, et al., 1966) but evidence is inconclusive as to what kinds of specific educational experiences produce the greatest attitude changes (Yuker, et al., 1966). Evidence suggests that situations in which a disabled person can demonstrate his repertoire of abilities enhances positive attitudes in the non-handicapped persons present. Rehabilitation personnel in hospital settings see an individual's disabilities rather than abilities which may account for Felty's (1965) and Bell's (1962) finding that rehabilitation workers respond to the ATDP scale with decreased acceptance. Felty (1965) found rehabilitation workers in Costa Rica were negatively affected by increased contact with handicapped persons as measured by the ATDP-O (partial $r=-.35$, $p<.05$).

Greenberg (1964) demonstrated the ability to modify attitudes by increasing information level. Even though the content did not involve disabled children, the process seems applicable. Using a test-retest method, 142 undergraduate students doubled their store of knowledge about fallout shelters ($p<.001$) after three lectures and several reading sessions. In addition, their attitudes spread to other concepts like types of shelters ($p<.01$). Attitudes were not significantly related to knowledge prior to the information dissemination but were after dissemination ($p<.05$). Greenb erg (1964) concluded that the more a person is deliberately exposed, the more he learns, then his belief structure is

modified and he desires more information. Thus, the magnitude of attitude change increases but the direction may be either positive or negative. He calls this the "boomerang effect of persuasive information." This becomes troublesome if the concern is with a direction of change rather than magnitude.

Summary

Even though significant numbers of myelodysplastic children are not specifically included in the current research involving attitudes toward disabled people, there is no evidence indicating attitudes toward myelodysplastics are different from those toward other moderately disabled multihandicapped children. It is likely that educators see myelodysplastic children somewhat negatively, are not very knowledgeable of the disability itself, and are amenable to attitude modification by increasing their information level. Attitudes of teachers influence the attitudes of their disabled students and conversely the behavior of disabled students contribute to teacher attitude formation. Research supports a relationship between educator attitudes and the degree of disability but no recent investigations have been published relating attitudes toward multihandicapped or myelodysplastic children to intelligence, social development, or the effect of frequent pertinent communications with a medically centered pediatric team.

CHAPTER III

DEVELOPMENT OF THE PROBLEM

Theory of Disability

Of the various theories concerning disability, the somatopsychological model of Wright (1960) provides the most appropriate framework for identifying and describing attitudes toward myelodysplastic students and modes of modifying these attitudes in a positive direction. Wright's point of view like Sheldon's (1940) theory of constitutional psychology relates physique and behavior but the somatopsychological approach posits the connection not in a direct way but mediated by what are termed intervening variables. There are several reasons why this theoretical position seems most appropriate for the present investigation: (1) it accounts for socio-economic and cultural differences in the disabled, (2) it emphasizes the tremendous degree of individual variation among the physically disabled even within a group of similarly disabled, (3) it allows for manipulating variables in an attempt to effect attitude change, (4) it defines the various societal attitudes held toward the physically disabled, (5) it encourages a phenomenological or personal approach to understanding behavior, and (6) it does not stereotype physique and behavior.

Although public verbalized attitudes toward the disabled are mildly favorable, evidence suggests that deeper unverbalized attitudes exist and are frequently more hostile (Barker, 1953). Increasing the

information level concerning disability and improving the quality of relationships with disabled persons are methods of modifying attitudes toward these people (Haring, 1958; Siller, 1967; Wright, 1960).

Contemporary society relates expected behavior to physique in the disabled and attitudes result from these perceptions. Examples are aesthetic aversion to visible impairments and the generalization that disability implies limitations in all areas of function (Siller, 1967). Similarly, many of the disabled see themselves as second-rate members of a minority group whose contribution is questionable when compared to that of the non-disabled and the energy required for each to accomplish the same task (Barker, et al., 1953).

There is some evidence to support the assumption that attitudes held by teachers influence attitudes and behavior of students. Therefore, attitude modification of educators toward more realistic acceptance and knowledge of their disabled students should influence these children toward developing a more realistic acceptance of themselves (Haring, et al., 1958). It is not the disabled physique as such that makes the person hide his deformed foot, but his attitudes toward it. These attitudes logically connect physique with behavior. Many of the attitudes of handicapped children are derived from persons around them. The more grotesque or multiple a child's handicaps, the more sources of visual stimuli for attitude formation by parents, teachers, peers, and the child himself. The congenital impairment of myelodysplasia is an extreme illustration of multiple physical, social, intellectual, and educational problems. In this population attitudes of educators certainly contribute to the child's self-concept, adjustment, and ultimate school success. Educators must possess a complete understanding of these children, their individual

variations and multiple involvements in order to develop rational attitudes about them. One anecdotal report is available (Buchanan and Mullins, 1968) which describes one such attempt at increasing understanding in the University of Pittsburgh demonstration school. The hospital school and rehabilitation personnel assisted in the integration of myelodysplastic five-year-old twins into a regular kindergarten. Much effort and communication was required but all concerned reported a successful and worthwhile endeavor. The adaptability of child, peers, teachers, and school was achieved with minimal effort after placement and transportation problems were solved.

General Description of Myelodysplasia

The vertebral column consists of seven cervical, twelve thoracic, five lumbar, and five sacral segments containing the spinal cord as it extends from the hind-brain. In addition to the open spine in myelodysplasia, there is herniation of nerve roots, spinal cord, and their covering causing a visible cystic mass. Figure 1 illustrates the motor component of the central nervous system and a myelomeningocele at L-3, 4 resulting in only the ability to flex the hip and extend the knee. All other motions of the lower extremity are absent. A myelomeningocele occurring between the second and third sacral levels (S-2, 3) interferes with motor responses of the muscles innervated by S-3 and lower spinal levels. Since the muscles of the lower extremities are innervated above this level, and those of voluntary bowel control are innervated below this level, the motor deficit in the child is lack of bowel and bladder control but ability to walk and run is not impaired. A myelomeningocele occurring at the L-5, S-1 level would deem the child unable to stand on his toes in addition to the loss of voluntary bowel and bladder control. Sphincter paralysis occurs in all cases of myelo-

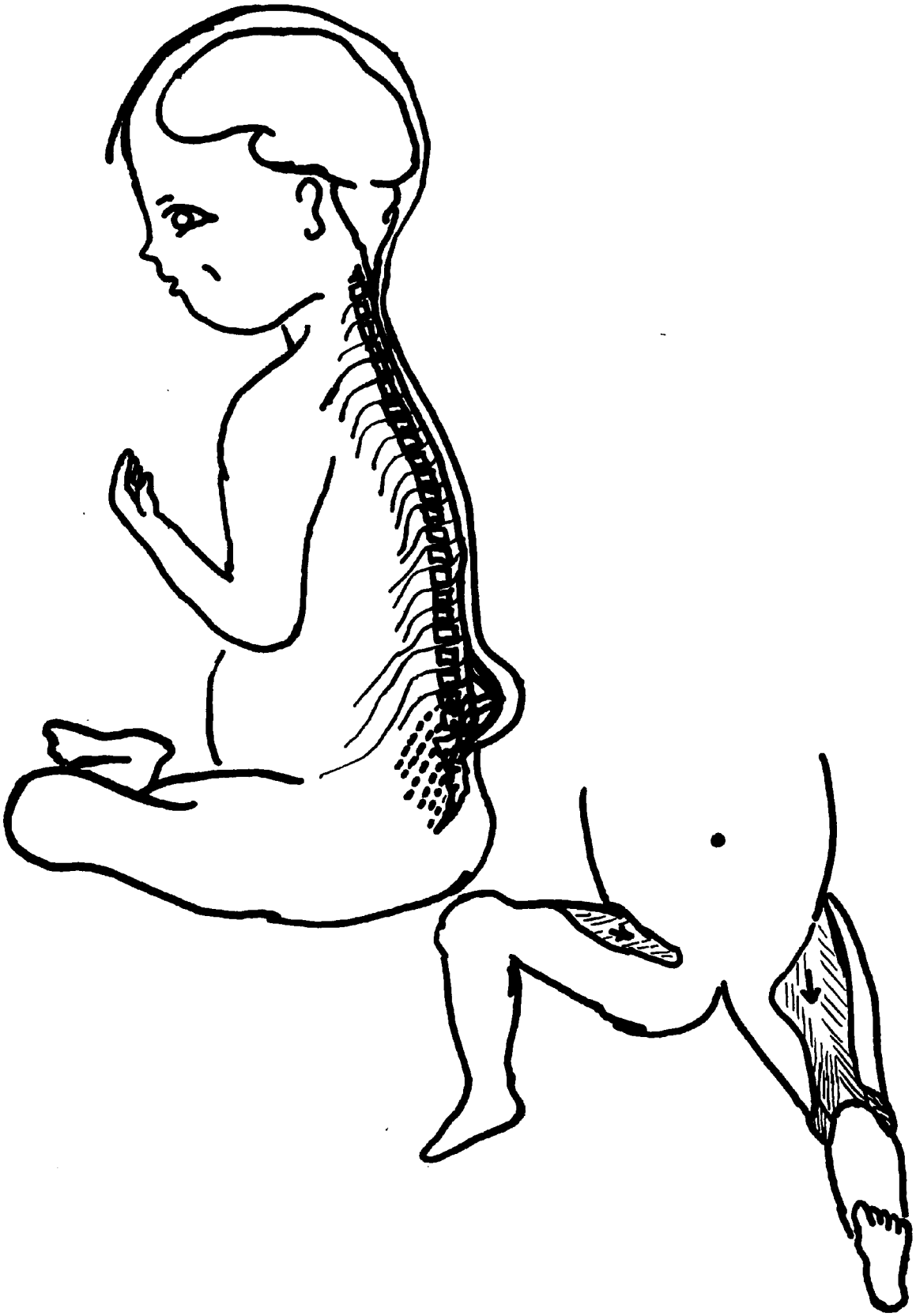


Fig. 1. Illustration of myelomeningocele at spinal level L-3, 4.

meningocele. About 90 per cent of myelomeningoceles occur in the lumbo-sacral area and 10 per cent at higher segments. The extent to which the spinal cord and nerve roots herniate into the sac is not predictable so that cases occur whereby a few nerve fibers to muscles innervated by segments below the sac escape involvement leaving those muscles partially useful.

McNab (1958) found that about one-third of children born with a myelomeningocele had an associated hydrocephalus at birth. An additional 16 per cent develop hydrocephalus before three months of age. This is due to the associated hind-brain malformations. After three months of age, hydrocephalus does not ordinarily develop. Contrary to McNab (1958), Foltz (1963) presents the point of view that hydrocephalus is probably present in all cases of myelomeningocele.

Other congenital anomalies are common in these children. Of primary importance to this investigation were those of the skeletal and urologic systems (Cameron, 1957).

When an infant is born with an observable sac on the back, a meningocele is differentiated from a myelomeningocele by observing absence or presence of motor and sensory modalities in affected areas. When the anal sphincter does not respond by contraction when pricked with a pin, the sphincter is not innervated and this condition is described as a myelomeningocele, i.e. the sac contains portions of spinal cord. If the sphincter does respond, it is innervated, the cord is intact, and the sac contains no nervous tissue, and no neurologic disability results. This is a meningocele.

Experience with Myelodysplasia at the University of Michigan Medical Center

Since 1960 a multidisciplinary Pediatric Rehabilitation Team has existed at the University of Michigan Medical Center (UMMC) to serve the pediatric population with physical impairments in addition to other medical and psycho-social disabilities. The efficiency and the effectiveness of this innovation was predicated on the previous success of the multi-disciplinary approach in the medical care of the large population of children and adults treated at the University of Michigan Poliomyelitis Respirator Center from 1950 to 1962. Here a team representing pediatrics, orthopedic surgery, physical medicine, medical social work, and education was geographically located in a teaching hospital. This group worked together to meet the multiple needs of the severely physically disabled hospitalized polio patients and plan for the return to their family and local community. The success of this approach was exemplary in meeting the epidemic crises of poliomyelitis in the 1950's. Secondary gains of this team approach were reduced mortality, morbidity, and institutional placement accompanied by maximal physical and vocational rehabilitation. Due to the architectural barriers, lack of facilities, personnel, and a variety of other reasons many of the school age population were excluded from immediate return to school and education was continued on a home-bound basis. Many of these roadblocks to education have since been overcome. With the discovery of poliomyelitis vaccine the number of polio patients was drastically reduced during the last decade but the information gained in rehabilitation techniques has continued to be used in cases of other multihandicapping conditions and in the younger age groups.

Of the children seen for evaluation, diagnosis, treatment, and follow-up by the present Pediatric Rehabilitation Unit, 155 have myelodysplasia. Table 1 shows the primary diagnosis and age distribution of the total patient population.

TABLE 1

PRIMARY DIAGNOSES AND AGE DISTRIBUTION OF CHILDREN SEEN IN THE PEDIATRIC REHABILITATION CLINIC FROM NOVEMBER, 1966, TO JULY, 1968

Diagnoses	Ages in Years as of July, 1968			Total
	0-5	6-11	12-17	
Congenital Neuromusculoskeletal defects				
Myelodysplasia	78	56	21	155
Cerebral palsy	62	42	12	116
Muscular dystrophy	0	4	2	6
Hypertonia	7	2	1	10
Achondroplasia	5	1	1	7
Arthrogryposis	4	2	0	6
Developmental retardation	10	3	0	13
Other, e.g. amputee, scoliosis, club feet, etc.	14	18	7	39
Subtotal	180	128	44	352
Acquired Neuromusculoskeletal disabilities				
Collagen diseases	19	71	72	162
Polio	1	9	17	27
Guillain-Barre	1	5	5	11
Trauma	5	6	6	17
Subtotal	26	91	100	217
Total	206	219	144	569

A core group consisting of a nurse, social case worker, physical therapist-special educator, physiatrist, orthopedic surgeon, clinical psychologist, two pediatricians, trainees and students in each of these disciplines, and clerical staff hold clinics bi-weekly to serve the comprehensive needs of these children and to enlist services of other

consultants as a need may intermittently arise. In the past eight years a wealth of medical information has been collected and techniques for management have improved through this team approach.

The initial problems of the newborn with a myelomeningocele are neurosurgical in nature. Currently at the UMMC a primary repair of the sac is carried out in 80 per cent of cases. In the remaining 20 per cent repair is usually not feasible for technical reasons. In cases having hydrocephalus, about 50 per cent require definitive surgical treatment of this associated defect. Hydrocephalus occurs most often in children with defects at the thoracic or high lumbar levels. There is a 30 per cent complication rate in the contemporary surgical method of ventriculoatrial shunting for the arrest of hydrocephalus. After the newborn period, hospitalizations are infrequent, and all but surgical treatment can be accomplished by frequent outpatient visits. The incidence of paralytic dislocated hips and club feet as associated abnormalities of myelodysplasia is high, 34 per cent having hip dislocations and 57 per cent having club feet (Hayes, Gross, and Dow, 1964).

The mortality rate of children with myelomeningoceles has been about one per cent in the first year of life and about five per cent in the first five years of life. In the past eight years there have been only two known deaths beyond age five in this population.

Depending on the level of the defect, intellectual impairment, the lack of complications, and the motivation of the child and/or his family, the feasibility of ambulation can be predicted quite early and the appropriate ambulatory aids and instruction for their use are provided.

Since the incidence of detrusor paralysis in cases of myelomeningocele is very high, all of the problems of the management of the paralytic bladder exist in this group of children. At this time, experience indicates that urinary diversions become necessary in all but a very few cases, but this procedure is delayed until there is early evidence of kidney damage in terms of hydronephrosis and hydroureters, or if recurrent urinary sepsis cannot otherwise be managed. Children with lumbosacral myelomeningoceles usually require diversions by age seven. Diversions become necessary sooner in children with defects occurring at the higher spinal levels. A program of bowel evacuation for managing fecal incontinence has been devised and is successful in 85 per cent of cases (Sullivan, Dickinson, and Wilson, 1963).

Intellectual impairment may be present in the myelodysplastic child. Such impairment may be related either to the associated hydrocephalus or simply a reflection of genetic endowment (Gibson, Sullivan, and Dickinson, 1965).

The patient group described above is relatively young. Since extensive multidisciplinary knowledge regarding myelodysplasia and effective surgical procedures has been available and applied for less than 15 years, the bulk of the myelodysplastic population is under 15 years of age. Prior to these innovations, the survival rate was quite low.

Statement of the Problem

Myelodysplastic children illustrate a truly multihandicapped group requiring multiple interdisciplinary services and communication. It is thought that frequent communication from a medically centered team interpreting the medical, physical, social, and emotional status, and immediate and long term goals in terms of classroom planning may

positively affect the attitudes of the classroom teacher toward these children. It is essential that a two-way communication system be established for feedback of events (Thibaut, Coules, 1952) occurring at both the medical center and in the classroom. With a stable medically centered team incorporating the classroom teacher as a member, true comprehensive care of the myelodysplastic child is feasible. Medical findings can be interpreted into educationally useful information. Likewise, the teacher can feed back programming, progress, and realistic educational goals which may influence long term medical planning, e.g. timing of elective hospitalizations for evaluations and/or surgeries.

Since the roles of the principal and special education director are quite different from the classroom teacher in affecting student behavior, medical information about a given child may have little influence on an administrator after the child is placed in the school setting. Communication from a medically centered team may affect less positive attitude change in these persons. Similarly the functions and expectations of physical and occupational therapists are different from the classroom teacher. Administrators and therapists are much more concerned with and influenced by mechanical management of disabled students such as transportation, scheduling treatments, and safety practices.

Because of the significant role difference, teachers may view academic achievement, behavior, and progress differently from either therapists or administrators. Thus it is possible that school-based personnel having various roles do not derive similar or equal gains from the proposed interdisciplinary communication, or collectively use such information in managing the child in the educational environment. Perhaps attitudes toward myelodysplastic children have nothing to do with

knowledge of the various handicaps or findings pertinent to a specific child. Possibly, attitudes of their teacher, administrator, and therapists are related specifically to intelligence, mobility, and social maturity rather than to increased knowledge of the child's total function, educational expectations, or contact with him.

Hypotheses

The intent of this study is to test the following research hypotheses:

1. There is a positive change in the attitude of teachers toward myelodysplastic students when frequent, educationally oriented communication is initiated by a medically centered pediatric rehabilitation team and shared with these teachers.

2. There is a positive change in the attitudes of principals toward myelodysplastic students, but of less magnitude than teachers when frequent, educationally oriented communication is initiated by a medically centered pediatric rehabilitation team.

3. There is a positive change in the attitudes of special education directors toward myelodysplastic students, but of less magnitude than teachers when frequent, educationally oriented communication is initiated by a medically centered pediatric rehabilitation team.

4. There is a positive change in the attitudes of physical and occupational therapists toward myelodysplastic students, but of less magnitude than teachers when frequent, educationally oriented communication is initiated by a medically centered pediatric rehabilitation team.

5. There is a negative correlation between the chronological ages of myelodysplastic students and the attitudes of (a) teachers; (b) principals;

(c) special education directors; and (d) therapists toward these children; as ages increase positive attitudes decrease.

6. There is a positive correlation between the intellectual abilities of myelodysplastic students and the attitudes of (a) teachers; (b) principals; (c) special education directors; and (d) therapists toward these children; higher intelligence quotients evoke more positive attitudes.

7. There is a positive correlation between the social maturity of myelodysplastic students and the attitudes of (a) teachers; (b) principals; (c) special education directors; and (d) therapists toward these children such that higher social quotients evoke more positive attitudes.

8. There is a negative correlation between the degree of physical disability of myelodysplastic students and the attitudes of (a) teachers; (b) principals; (c) special education directors; and (d) therapists toward these children such that lesser disability evokes more positive attitudes.

CHAPTER IV

METHOD

Subjects

Selection of Subjects

From the total population of 155 myelodysplastic children currently known to the Pediatric Rehabilitation Unit at the University of Michigan Medical Center (UMMC) those currently enrolled in a school program were selected for study. The parents were contacted and written permission was received for participation of their child. To obtain comparable experimental and control groups, the total group of 47 females and 31 males were matched as to sex (M,F), chronological age (CA), and mental age (MA). Due to the group size, it was not feasible to match on any other characteristics. The CAs were matched within a range of nine months and IQs arbitrarily within one standard deviation on the Stanford Binet Form L-M Scale (S-B). Except for two pairs, IQs were matched within ten points. Overlap of the recognized intellectual categories of trainable, educable, normal, and superior was avoided in every pair. Seventeen female and 17 male matched pairs resulted. Seven females and three males who were matched prior to data collection had to be eliminated for one of a variety of reasons. Thus data were collected on a total of 58 myelodysplastic subjects in the present investigation; 48 (20 F, 28 M) were matched in 24 pairs and 10 were unmatched (7 F, 3M) myelodysplastic children. Although these children reside throughout the state of Michigan, several attend the same schools. Therefore, care

was taken to have members of the experimental and control groups in different buildings. The subjects were otherwise randomly assigned a position in the experimental or control group.

All of these children had routine pediatric, orthopedic, urologic, neurosurgical, and physiatric evaluations and definitive treatment as indicated by each discipline had been provided since birth. During the routine pediatric check, screening tests were done for speech, hearing, and vision. If there was any question of pathology, a referral was made to the appropriate discipline and findings made available. Psychometric testing had been done on each child and repeated each six to twelve months until the clinical psychologist judged the results valid. If questions arose after this point regarding intellectual functioning, informal re-evaluations were made during routine clinic visits.

In addition to granting permission, each child's parents provided the investigator with the name and address of their child's school, teachers, principal, director of special education, physical therapist, and occupational therapist. This group of school personnel served as the educator subjects. No attempt was made to match these subjects on any dimension.

Description of Subjects

Myelodysplastic Children

A tabular description of the student subjects is included in Appendix A. The chronological age range of the total group was 3.9 to 15.1 years (mean, 8.9 years). The mental ages ranged from 1.1 to 19.5 years (mean, 7.6 years). The social ages ranged from 2.33 to 18.75 years (mean, 7.9 years).

Various levels of spinal cord involvement were represented. Seven had lesions at thoracic levels; 13 at the first and second lumbar levels; 7 at the third lumbar; 9 at the fourth lumbar; and 9 at the fifth lumbar levels. Thirteen children had lesions at sacral levels. The ambulation status was somewhat related to these levels of lesions. Nineteen children were mobile only with the use of a wheelchair; 21 were ambulatory with the use of braces and crutches, and 2 with either braces or crutches. Sixteen children were completely ambulatory without the use of any ambulatory aids. Table 2 shows the type of orthopedic appliances utilized by the sample.

TABLE 2

TYPE OF ORTHOPEDIC APPLIANCES UTILIZED

Appliances	Number	Per Cent
None	19	32
Orthopedic shoes only	4	7
Short leg brace(s)	8	14
Long leg brace(s)	19	32
Long leg braces with a pelvic band	6	10
Long leg braces with a back brace	1	2
Back brace only	1	2
Total	58	100

The primary defect of the myelomeningocele had been repaired in 90 per cent of the children. Thirty-eight children demonstrated evidence of hydrocephalus with surgical arrest in 50 per cent of the group. Urinary diversions had been done on 26 or 45 per cent of the total sample.

In addition to the neurosurgical and urological interventions, several orthopedic procedures were carried out on this sample. Of primary importance are those involving the hips and feet since these

have direct bearing on the ultimate ambulation status of a child. Twenty-two children (38 per cent) had neither dislocated hips nor foot deformities. Only 4 of this group were non-ambulatory; these 4 represented higher levels of spinal defects. Of the 36 having hip and/or foot involvement 27 had unilateral or bilateral hip dislocations. Twelve children had surgical repairs for these defects. Twenty-six (45 per cent) children had paralytic foot deformities, 13 of which had surgical correction. Table 3 shows the number of subjects who were ambulatory (A) or non-ambulatory (NA) relative to type and treatment of hip and foot involvement.

TABLE 3

RELATIONSHIP OF AMBULATION STATUS TO HIP AND FOOT INVOLVEMENT

Hip Status	Foot Status						Total
	No Problems		Surgical Repair		No Repair		
	A	NA	A	NA	A	NA	
No problem	18	4	6	0	2	1	31
Surgical repair	4	1	3	0	4	0	12
No repair	3	3	1	3	1	4	15
Total	25	8	10	3	7	5	58

Table 4 summarizes the other types of medical problems present in 20 or 35 per cent of the 58 subjects. Seven or 32 per cent of the 20 had two or more of the problems listed. Most of these problems are complications of the neurologic deficit requiring close parental and medical supervision for prophylaxis and/or to minimize progression in those instances where prevention is impossible.

TABLE 4

ASSOCIATED MEDICAL PROBLEMS IN THE SAMPLE

Associated Problems	No.
Multiple contractures	6
Scoliosis	9
Skin breakdown	3
Mild cerebral palsy	5
Obesity	4
Total	27

Table 5 shows the type and frequency of other surgical treatments in the habilitation process. Eleven of the children described in Table 4 are included in Table 5. Six or 30 per cent of the 20 children surgically treated, underwent two or more of the procedures listed.

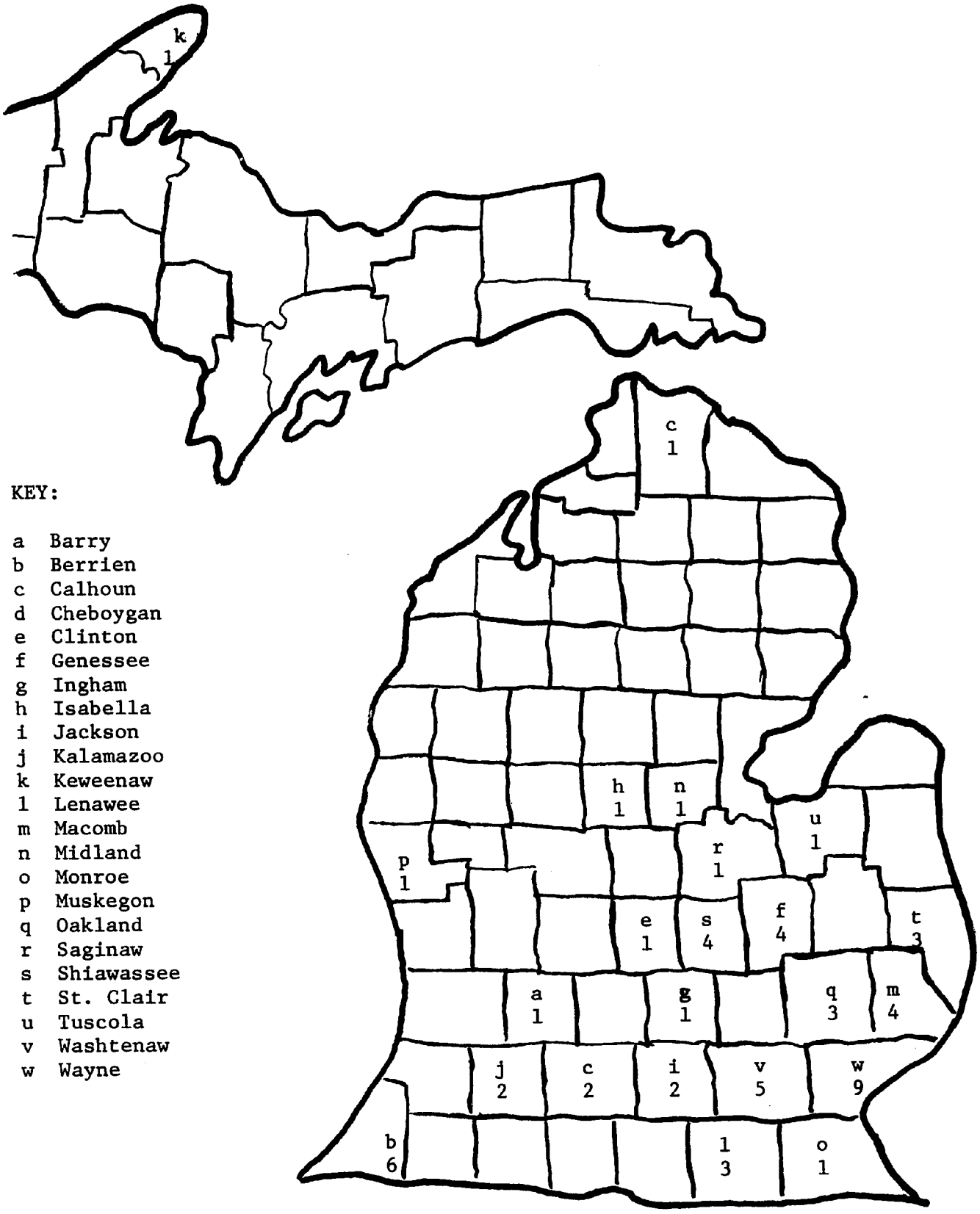
TABLE 5

OTHER SURGICAL PROCEDURES

Surgical Procedure	No.
Vertebral resection	1
Femoral osteotomies	5
Release of contractures	13
Tendon transfers	7
Total	26

The population of children was nearly equally divided between urban and rural residence. Communities having populations of 10,000 or less were regarded as rural. This resulted in 24 or 41 per cent considered rural and 34 or 59 per cent urban residents.

Figure 2 shows the county of residence of the subjects. In general, the 23 counties of residence represent areas where educational programs are organized to meet the needs of the multihandicapped child but multidisciplinary medical programs are not as available.



KEY:

a Barry
b Berrien
c Calhoun
d Cheboygan
e Clinton
f Genessee
g Ingham
h Isabella
i Jackson
j Kalamazoo
k Keweenaw
l Lenawee
m Macomb
n Midland
o Monroe
p Muskegon
q Oakland
r Saginaw
s Shiawassee
t St. Clair
u Tuscola
v Washtenaw
w Wayne

Fig. 2. Distribution of subjects by county of residence.

Table 6 shows the current school placements and grade levels of the sample. In addition to those listed, eight children were enrolled in pre-school programs for the orthopedically handicapped.

TABLE 6

GRADE AND SCHOOL PLACEMENT

Grade	School Placement				Total
	Regular	Prog. for Phys. Handi.	Prog. for Ment. Handi.	Homebound	
Kg.	3	4	0	1	8
1	6	3	1	1	11
2	4	3	0	0	7
3-6	3	10	0	0	13
7-10	3	1	0	0	4
Ungraded	0	3	3	1	7
Total	19	24	4	3	50

Due to the nature of myelodysplasia, associated problems, and the necessity for special education services, late school starting might be predicted. In this sample only seven or 13 per cent were over-age at the time they entered school.

It is of interest to note that once school placement had been achieved, there was very little movement into another placement. Only five or 11 per cent of the 44 children originally placed in special education programs moved into partially or completely integrated school settings. All five children represented the less severely involved, had IQs and SQs within normal ranges, were completely ambulatory although three wore short leg braces; the three children who moved into partially integrated programs had urinary diversions; the two who moved into regular classrooms were incontinent also but had no diversion; none of the five children represented other medical problems.

An additional three children of the 44 were relocated within special education programs and all of these were placements into programs for the mentally handicapped. A variety of factors may account for little movement: program availability, the tendency to perpetuate a label (Combs and Harper, 1967; Semmel, 1966); and the infrequency of routine re-evaluation of special education placements.

The socioeconomic level of each child and his family was assessed on the basis of father's occupation using Duncan's Socioeconomic Index for all Occupations (Reiss, 1961). This index considers education and income as well as the prestige factor of the occupation. Occupations are assigned index numbers in the following categories: professional, technical, and kindred workers; managers, officials, and proprietors; clerical; sales; craftsmen; operatives and kindred workers; miscellaneous manufacturing; private household; service workers; and laborers. Table 7 shows the distribution of subjects according to the father's occupation.

TABLE 7

FATHER'S OCCUPATION

Occupation	No.	Per Cent
Professional	5	8
Mgr., prop.	4	7
Sales	4	7
Craftsman	14	23
Operative	19	35
Misc. mfg.	1	2
Serv. work.	3	5
Laborer	5	8
Total	58	100

The typical myelodysplastic child in this study was 8.9 years old. He had an IQ of 86 (MA, 7.6 years) and an SQ of 90 (SA, 7.9 years). He had two siblings, lived in an urban area, and came from an upper-lower-

class family as determined by his father's occupation. The site of his neurologic deficit was at the third lumbar vertebra necessitating the use of long leg braces and crutches for ambulation. The myelomeningocele had been surgically repaired and hydrocephalus had been arrested by the insertion of a Holter valve. He had no bowel or bladder control and a urinary diversion may or may not have been done. At least one other surgical procedure had been done to repair dislocated hips or improve foot position for ambulation. He was in a regular school placed in either an orthopedic or regular classroom. He had been in this classroom setting since beginning school at the kindergarten level.

Educators

Demographic information was collected for each educator on biographical data sheets. Copies may be found in Appendix B. Table 8 gives the sex distribution of educators by role and Table 9 shows the marital status by role.

TABLE 8

SEX BY ROLE

Role	Sex				Total
	Male		Female		
	No.	Per Cent	No.	Per Cent	
Teacher	13	23	51	58	64
Principal	26	46	14	16	40
Director	16	29	1	1	17
PT	0	0	17	20	17
OT	1	2	4	5	5
Totals	56	100	87	100	143

TABLE 9

MARITAL STATUS BY ROLE

Role	Marital Status				NR	Total
	Married	Single	Divorced	Widowed		
Teacher	35	14	1	3	11	64
Principal	28	3	0	1	8	40
Director	14	1	0	0	2	17
PT	7	6	0	2	2	17
OT	3	1	1	0	0	5
Totals	87	25	2	6	23	143

Table 10 gives the distribution of educators according to age.

TABLE 10

AGE BY ROLE

Role	Age in Years				NR	Total
	20-30	31-40	41-50	Over 50		
Teacher	25	6	5	14	14	64
Principal	1	13	9	9	8	40
Director	0	9	6	0	2	17
PT	0	3	6	6	2	17
OT	0	3	2	0	0	5
Totals	26	34	28	29	26	143

Table 11 gives the level of education by role in terms of degrees held.

TABLE 11

LEVEL OF EDUCATION BY ROLE

Role	Degree					NR	Total
	Bachelor's	Master's	Ed.D.	Ph.D.	Other		
Teacher	32	15	1	0	2	14	64
Principal	6	22	4	1	0	7	40
Director	0	12	2	1	0	2	17
PT	14	1	0	0	0	2	17
OT	5	0	0	0	0	0	5
Total	55	50	7	2	2	25	143

Certification of the various educators by role is shown in Table 12. All physical and occupational therapists had professional certification in their respective area.

TABLE 12

CERTIFICATION BY ROLE

Certification	Role			Total
	Teachers	Principals	Director	
NR	14	11	2	27
Elem. Cert.	33	16	6	54
Second. Cert.	10	5	5	20
Elem. & Second.	4	6	2	12
None	3	2	2	7
Total	64	40	17	120

The three teachers and one principal for whom there was no certification were employed in Day Care programs. One additional principal was employed in a special pre-school program. One special education director without a teaching certificate moved from a diagnostician position to an administrative position for which certification was not

required. The other special education director had a junior college teaching certificate but did not have elementary or secondary certification.

Great variation existed in special education approval in the sample of educators. All teachers, principals, and special education directors working in special education programs held full approval in at least one area of exceptionality except for four teachers, two of whom had temporary approval in the area of the mentally handicapped and two worked in day care programs where approval is not required. As might be predicted, most special education approvals were in the areas of the crippled, hospitalized, and homebound.

The mean years of teaching experience in regular classrooms, special education classrooms, and the mean years of experience in regular and special education administration are shown in Table 13.

TABLE 13

YEARS OF TEACHING AND ADMINISTRATIVE EXPERIENCE BY ROLE

Role	Mean Yrs. of Teaching		Mean Yrs. of Administration	
	Regular	Spec. Ed.	Regular	Spec. Ed.
Teacher	6.5	2.8		
Principal	5.9	1.7	6.4	1.9
Director	1.6	6.3	0.5	4.8

In addition to information collected regarding education and certification, each educator was asked to rate his job satisfaction. Table 14 shows educator job satisfaction relative to years of regular classroom teaching experience and Table 15 shows educator job satisfaction relative to the years of teaching experience in special education.

TABLE 14

JOB SATISFACTION AND YEARS OF REGULAR CLASSROOM TEACHING

Yrs. of Regular Teaching	Job Satisfaction					Total
	Very Sat.	Mod. Sat.	Neither	Mod. Dissat.	Very Dissat.	
1-4	14	0	4	2	0	20
5-9	8	11	4	2	2	27
10-14	5	0	0	0	1	6
15 and over	11	5	1	0	1	18
Total	38	16	9	4	4	71

TABLE 15

JOB SATISFACTION AND YEARS OF SPECIAL EDUCATION TEACHING

Yrs. of Spec. Ed. Teaching	Job Satisfaction					Total
	Very Sat.	Mod. Sat.	Neither	Mod. Dissat.	Very Dissat.	
1-4	13	5	6	0	1	25
5-9	9	2	0	0	0	11
10-14	5	3	1	0	0	9
15 and over	2	2	0	0	0	4
Total	29	12	7	0	1	49

In summary, the educators in this study represented a broad spectrum of age, experience, education, and special education certification. The teacher and therapist subjects were primarily female while the principals and special education directors were primarily male. The teachers, physical therapists, and principals represented an equal distribution of age under and over 50 years. The special education directors and occupational therapists were all between 31 and 50 years old. In general, the teachers tended to be under 30 or over 50 years old. About half of the sample held graduate degrees. Twenty-six educators had no teaching experience in special education while 48 had

no regular classroom teaching experience. The regular school principals had more administrative experience than those in special education; and the special education directors had more special education teaching experience than administrative experience. Over half of the sample were satisfied with their present job assignment which seemingly had no relationship to the number of years of teaching experience.

The Instruments

Myelodysplastic Sample

The Stanford Binet Form L-M Intelligence Scale (Terman and Merrill, 1960), The Vineland Social Maturity Scale (Doll, 1936), a portion of Rehabilitation Codes (Riviere, 1962), and the University of Michigan Medical Records provided the data on the myelodysplastic subjects.

The commonly used instrument for evaluating the intellectual functioning of patients aged three to ten at the UMMC since 1960 is the Stanford-Binet Form L-M Scale (S-B). The characteristics of the 1960 revision of the S-B, compared with other available instruments, seemed to make it appropriate for measuring the intelligence of this population of children.

The Vineland Social Maturity Scale (VSMS) has been a long standing research instrument (Doll, 1936; Buros, 1965) used on various populations (Hurst, 1962; Iscoe, 1960; Pringle, 1960). This instrument provides a social age and a social quotient which are not dependent on life age except where life age is accompanied by genetic maturation as opposed to environmental opportunity or mere training (Doll, 1936). Doll (1936) also states that there is practically no relationship

between social scores and the cultural status from which the subjects are drawn. The subjects themselves can act as informants where age is not limiting. Since the present population has been known to the investigator for a number of years, parental prejudice in favor of the subject was felt to be minimal. Reliability and validity of this scale were well within acceptable limits (Doll, 1936). The social age derived from this scale was used as the level of social functioning.

The severity of the physical disability was determined by use of the Rehabilitation Codes (Riviere, 1962). The codes identify, classify, and evaluate impairments, disabilities, and handicaps in physical, psychosocial, educational, and vocational areas. These codes were devised by committees of professionals representing various rehabilitation disciplines as an attempt to systematize information essential to the rehabilitation process and were field-tested in several rehabilitation settings throughout the United States. Since the various codes are not interdependent, any one or combination can be used to describe an individual's rehabilitation status in a given area at any point in time. All coding is done on a zero-through-nine ordinal scale. A code number of nine indicates greatest severity and a code number of zero indicates least severity of disability. For the present study, only the code specifically designed for describing a physical disability was used. Members of the pediatric rehabilitation team jointly scored each child's physical disability as of May 25, 1968. A copy of this code is included in Appendix C together with definitions and instructions.

Intelligence tests were administered by the pediatric rehabilitation psychologist six to nine months prior to May, 1968; VSMSs were administered by the pediatric rehabilitation social worker and the physical

therapist from March to July, 1968. Since the degree of physical disability was determined on May 25, 1968, this date was also selected as the date for adjusting the mental and social ages.

Educator Sample

Form B of the Scale to Measure Attitudes Toward Disabled Persons (ATDP-B) was selected as the pre-test measure of attitudes held by the various educators toward myelodysplastic children and Form A of the same scale (Yuker, et al., 1966) was selected as the post-test measure. The ATDP is a short, easily administered and scored instrument using a Likert scale format intended to measure both disabled and non-disabled individual's attitudes toward disabled persons. There are three forms of this test. The original, Form 0, has 20 items. Forms A and B have 30 items each. All three forms present six response categories ranging from "I agree very much" through "I disagree very much." Ten to 15 minutes are required for completing the test. The test is scored by a weighted procedure. The test items are presumed to reflect perceived differences between disabled and non-disabled persons (Yuker, et al., 1966, p. 2). As with other Likert scales, raw scores are not very meaningful except when compared within a single group. Norms should be established for every group. A score which is high relative to other scores within a sample indicates that the respondent perceives disabled persons as being relatively similar to non-disabled persons and vice versa. Some of the items on the ATDP suggest negative connotations where a difference is perceived between the disabled and non-disabled. Therefore a score may be interpreted as reflecting the fact that a respondent perceives disabled persons not only as different but to some extent inferior or disadvantaged.

There is adequate evidence to suggest difficulty in falsely answering the ATDP. Available studies with the ATDP relate attitudes to grade level, sex, degree of disability, age of onset of disability, and other demographic variables which indicate that it is an appropriate attitude measure for this investigation (Yuker, et al., 1966). The median stability equivalency reliability coefficient is .74 for the various forms. A copy of Form A and Form B with a sample answer sheet is included in Appendix C.

The Procedure

All Educators

1. During the first week in January, 1968, Form B of the ATDP was sent to each school person involved in this study. At the end of the school term in June, 1968, Form A of the ATDP scale was sent to the same persons. An introductory letter to request cooperation and explain the project accompanied by the pre-test ATDP-B scale. A copy of this letter may be found in Appendix D.

2. At the end of the 1967-68 school year, each educator was requested to complete the Personal Data Sheet specific to each type of educator and return it along with the post-test ATDP-A answer sheet which was provided.

Experimental Group of All Educators

Letters or written communication is the commonly accepted means of information dissemination between the UMMC and local community agencies. There is no evidence concerning the effectiveness of this method of communication. This form of communication was utilized in this study to attempt to establish the degree of effectiveness of this method with school personnel as representative of a community agency. For purposes of this study, letters were used as the primary communication with a

few telephone calls in addition to relevant printed materials distributed to the various educators.

During the second semester of the 1967-68 school year, the following communication activities were initiated by the investigator with the experimental group of educators.

1. Immediately following each child's visit to the UMMC, for whatever purpose, a letter was directed to each school person who had contact with the child to inform him of the nature of the visit, medical or social action taken, interpretation of purpose, and implications for school planning in terms of placement, therapy prescription, or planned hospitalizations. Each educator in the experimental group received an average of two letters.

2. After receipt of the pre-test ATDP-B, a reprint of "A Major Challenge--The Multi-handicapped Child" by Edward Davens, M.D. (1964) was sent to each educator. This article describes the philosophy and necessity of comprehensive care for multihandicapped children and represents the approach of the UMMC rehabilitation team.

3. For each educator appropriate selections from the following printed materials were sent periodically:

a. "Spina Bifida and Myelodysplasia," an unpublished seminar topic presented as part of the training program in the UMMC Department of Physical Medicine and Rehabilitation.

b. "Spina Bifida Cystica and Family Stress (Hare, 1960).

c. "Prognosis for Paralysis in Myelomeningocele" (Stoyle, 1966).

d. "The Impact of the Handicapped Child on the Family" (Cohen, 1963).

e. "Birth Defects Bracing--Why, When, and How Much" (Larrick, 1965).

f. Abstract from "Functional Fashions for the Physically Handicapped" (Cookman and Zimmerman, 1961).

g. "School Children of Various Ages and With Various Handicaps in a Series of Demonstrations of Special Education" (Taylor, 1960).

h. "Multidisciplinary Problems of Myelomeningocele and Hydrocephalus" (Willson, 1965).

i. "The Urinary Bladder; Its Importance" (Wolcott, 1961).

j. "A Gel Support for Prevention of Decubitus Ulcers" (Spence, Burk, and Rae, 1967).

k. "Timing of Learning in the Myelomeningocele Patient" (Shurtleff, 1966).

l. "The Contribution of the Handicapped to the World Economy" (Taylor, 1960).

These materials were selected from the literature as representative of information available regarding the medical, social, economic, educational, and vocational implications of severe disability and myelodysplasia. In addition, they all are of a teaching nature and many describe methods of easier management of these children or prevention of further disability.

Teachers received reprints of articles a, b, c, d, e, f, and k; principals received reprints of articles b, d, g, k, and l; special education directors received reprints of articles b, c, d, k, and l; and the therapists received reprints of articles a, c, e, f, h, i, j, and k.

Control Group of All Educators

Only requested information was provided the school personnel concerned with the myelodysplastic children in the control group. However, one principal and one teacher did ask for additional information regarding one student's clinic visit. The basic information requested was sent.

Collection and Analysis of Data

Data collected from educators was done by mail; data from the student population was gathered in individual testing by the pediatric rehabilitation clinical psychologist and interview sessions by the pediatric rehabilitation social worker and physical therapist. All data was coded as shown in the Appendix and analyzed in several ways.

The Blitz Program (Ross, 1965) was used to produce frequency tables describing the demographic characteristics of all subjects included in this study and presented earlier in this chapter. This same program was used to describe the frequency of special education programs represented in this study and numbers of students enrolled.

The Two-Way Analysis of Variance with One Repeated Measure (Winer, 1963) was used to test the first four hypotheses as stated in Chapter III. This specific program is a translation by Roeber of an adaptation of a three-factor program adapted from Winer and written in MAD by Pena. The output from this program produced the following data for each matched educator pair: (1) raw ATDP scores; (2) the sum of squared deviations between groups and within groups; (3) the mean of squared deviations between groups and within groups; (4) degrees of freedom; (5) an F ratio; (6) the mean of each repeated measure; (7) the mean of each non-repeated level; and (8) the mean of each cell.

The Intercorrelation Program for Data with Missing Information (Johnson, 1968) was used to test the remaining four hypotheses. The output from this program produced the following data: (1) the mean and standard deviation of each educator's attitude score; (2) the means and standard deviations of the four selected student variables; (3) the coefficient of correlation of each possible variable pair; and (4) the *t* ratio of each coefficient of correlation.

This same intercorrelation program was used to compute coefficients of correlations between the five educator roles and the attitude score of each toward disability. In this run, the output produced the means and standard deviations of the ATDP pre-test scores for the ten possible role combinations as well as the coefficient of correlation for each possible combination and the *t* test for the significance of each correlation. In addition, *t* tests for planned comparisons (Hays, 1963) were done in conjunction with the two-way analysis of variance with one repeated measure program. Finally, the chi-square test for contingency tables of 2 x 2 and 2 x 3 was done on several unordered student and educator variables for which the intercorrelation program and *t* ratio were not appropriate.

CHAPTER V

RESULTS

Data were obtained from 143 educators working with 58 myelodysplastic children during the 1967-1968 school year. These educators included 64 teachers, 40 principals, 17 special education directors, 17 physical therapists, and 5 occupational therapists. Data were collected and analyzed, after attempts were made to increase the information level with the experimental group of educators, to determine attitude change in those educators performing similar roles in educational programming for each matched pair of myelodysplastic subjects. Attitude change was measured by the Attitude Toward Disabled Person's Scale. The results are summarized in three sections: (1) Attitude Changes in Educators; (2) The Relationship of Attitudes of Educators to Selected Characteristics of Myelodysplastic Subjects; and (3) Other Relationships.

Attitude Changes in Educators

Teachers

The two-way analysis of variance with one repeated measure and planned comparisons were used to test the first four hypotheses stated in Chapter III. In each of the following nine tables, the A effect represents the educator group membership (experimental, E or control, C) and the B effect represents the pre-test (P) and post-test (p) attitude score of each group member (repeated measure). The means in the planned comparisons represent the mean of the first variable and

and the mean of the second variable; the error represents the mean square error.

Table 16 shows the analysis of variance and the planned comparisons of attitude scores of the 16 matched pairs of teachers. The calculated F for this analysis was considered significant in the teacher group when it exceeded the tabular value for F at the five per cent level of confidence for one and 30 degrees of freedom; the calculated t for the planned comparisons was considered significant in the matched teacher group when it exceeded the tabular value for t at the five per cent level of confidence for 30 degrees of freedom. The tabular value of F_{95} (1,30) equals 4.17 and t_{95} (30)equals 1.697 (Hays, 1963).

There was no significant change in the attitude scores of the 16 matched pairs of teachers. The groups tended to be different as indicated by the pre-test t ratio of -.4652 but the difference was not significant.

Table 17 shows the analysis of variance and planned comparisons of attitude scores of 46 teachers paired only by treatment group (experimental and control) when F_{95} (1,44) equals 4.08 and t_{95} (44) equals 1.684 (Hays, 1963).

Table 17 shows that adding data from additional pairs of teachers did not produce results different from those of the matched pairs. Data presented in these two tables do not support the first hypothesis that teacher attitude scores are positively affected when frequent, educationally oriented communication about myelodysplastic children in their classrooms is provided by the UMMC Pediatric Rehabilitation Team.

TABLE 16

ANALYSIS OF VARIANCE AND PLANNED COMPARISONS OF ATTITUDE SCORES OF SIXTEEN MATCHED PAIRS OF TEACHERS

Source of Variation	Sum of Squares	df	Mean Squares	F
Between subjects	27063.75	31		
A (group)	1.50	1	1.50	0.00
Subjects within groups [error (between)]	27062.25	30	902.07	
Within subjects	8076.00	32		
B (treatment)	.50	1	.05	0.00
B X subjects within groups [error (between)]	7733.12	30	257.77	

Planned Comparison	Mean	Mean	Error	df	t
EP-CP	110.25	115.19	902.07	30	-.46
Ep-Cp	115.06	110.75	902.07	30	.40
Ep-EP	115.06	110.25	257.77	30	.84
Cp-CP	110.75	115.19	257.77	30	-.78

Key: E - experimental
C - control
P - pre-test
p - post-test

TABLE 17

ANALYSIS OF VARIANCE AND PLANNED COMPARISONS OF ATTITUDE SCORES OF EQUAL NUMBERS OF EXPERIMENTAL AND CONTROL TEACHERS

Source of Variation	Sum of Squares	df	Mean Squares	F
Between subjects	36459.00	45		
A (group)	9.00	1	9.00	0.01
Subjects within groups [error (between)]	36450.00	44	828.41	
Within subjects	11377.00	46		
B (treatment)	113.00	1	113.00	0.48
B X subjects within groups [error (between)]	10448.00	44	237.45	

Planned Comparison	Mean	Mean	Error	df	$\underline{t}$
EP-CP	114.26	119.61	828.41	44	-.63
Ep-Cp	118.00	111.43	828.41	44	.77
Ep-EP	118.00	114.26	237.45	44	.82
Cp-CP	111.43	119.61	237.45	44	-1.58

Principals

Data on the principals in this study were treated in the same way. The results for the 9 matched pairs of principals are shown in Table 18. The tabular value of F at the 5 per cent level of confidence for 1 and 16 degrees of freedom equals 4.49 and the tabular value of t at the 5 per cent level of confidence with 16 degrees of freedom equals 1.746 (Hays, 1963). The results were not significant but a change in attitude scores did occur in the experimental group as indicated by the t=1.7169. The mean scores were higher for the principals than for the matched pairs of teachers. The principals had the smallest error within subjects of all groups of educators. Table 19 shows the analysis of variance and planned comparisons for attitude scores of 14 of experimental and 14 control principals. The tabular value of F_{95} (1,26) equals 4.23 and t_{95} (26) equals 1.706 (Hays, 1963). The results reported in Table 19 are similar to those presented for the nine matched pairs of principals. These data do not support the second hypothesis that attitude scores are changed in a positive direction when frequent, educationally oriented communication is provided by the UMMC Pediatric Rehabilitation Team concerning myelodysplastic children.

Special Education Directors

Table 20 shows the attitude score changes in four matched pairs of special education directors. The tabular value of F at the 5 per cent level of confidence for 1 and 6 degrees of freedom equals 5.99 and t at the 5 per cent level of confidence for 6 degrees of freedom equals 1.895 (Hays, 1963). A significant change in attitude scores did occur in the matched pairs of special education directors. The pre-test and post-test means show that the experimental and control groups were

TABLE 18

ANALYSIS OF VARIANCE AND PLANNED COMPARISONS OF ATTITUDE SCORES OF NINE MATCHED PAIRS OF PRINCIPALS

Source of Variation	Sum of Squares	df	Mean Squares	F
Between subjects	15159.75	17		
A (group)	2100.94	1	2100.94	2.57
Subjects within groups [error (between)]	13058.81	16	816.18	
Within subjects	2249.50	18		
B (treatment)	191.62	1	191.62	1.61
B X subjects within groups [error (between)]	1901.94	16	118.87	

Planned Comparison	Mean	Mean	Error	df	t
EP-CP	113.00	132.44	816.18	16	-1.45
Ep-Cp	121.78	132.89	816.18	16	- .82
Ep-EP	121.78	113.00	118.87	16	1.71
Cp-CP	132.89	132.44	118.87	16	.08

TABLE 19

ANALYSIS OF VARIANCE AND PLANNED COMPARISONS OF ATTITUDE SCORES
OF EQUAL NUMBERS OF EXPERIMENTAL AND CONTROL PRINCIPALS

Source of Variation	Sum of Squares	df	Mean Squares	F
Between subjects	25357.37	27		
A (group)	1683.00	1	1683.00	1.85
Subjects within groups [error (between)]	23674.37	26	910.55	
Within subjects	11080.50	28		
B (treatment)	54.00	1	54.00	0.13
B X subjects within groups [error (between)]	10782.06	26	414.69	

Planned Comparison	Mean	Mean	Error	df	t
EP-CP	111.14	126.29	910.55	26	-1.32
Ep-Cp	117.29	124.07	910.55	26	- .61
Ep-EP	117.29	111.14	414.69	26	.79
Cp-CP	124.07	126.09	414.69	26	- .26

TABLE 20

ANALYSIS OF VARIANCE AND PLANNED COMPARISONS OF ATTITUDE SCORES OF FOUR MATCHED PAIRS OF SPECIAL EDUCATION DIRECTORS

Source of Variation	Sum of Squares	df	Mean Squares	F
Between subjects	5386.44	7		
A (group)	4590.06	1	4590.60	34.58*
Subjects within groups [error (between)]	796.38	6	132.73	
Within subjects	1642.50	8		
B (treatment)	370.56	1	370.56	1.76
B X subjects within groups [error (between)]	1266.87	6	211.15	

Planned Comparison	Mean	Mean	Error	df	t
EP-CP	137.75	102.75	132.73	6	4.29**
Ep-Cp	146.25	113.50	132.73	6	4.02**
Ep-EP	146.25	137.75	211.15	6	.82
Cp-CP	113.50	102.75	211.15	6	1.04

*Sig. at .01
**Sig. at .005

significantly different at the outset. Changes occurred in the control group of directors which approached significance also (t=1.05). These two factors contribute to the significant change observed on the post-test attitude scores.

Table 21 shows the analysis of variance and planned comparisons of 14 directors matched by group. F_{95} (1,12) equals 4.75; t_{95} (12) equals 1.78 (Hays, 1963). As shown in Table 21, a significant change in attitude scores did occur in the experimental group. A change in attitude scores also occurred in the control group but the difference was not significant. The special education directors in the experimental group included in the matched pairs had the highest pre-test and post-test mean scores on the ATDP of all educators in this study.

The results in Table 21 do support the hypothesis that positive changes occur in the attitude scores of special education directors when frequent, educationally oriented communication is initiated by the UMMC Pediatric Rehabilitation Team regarding myelodysplastic children and shared with special education directors.

Physical Therapists

Table 22 shows the analysis of variance and planned comparison of attitude scores in three matched pairs of physical therapists. The tabular value for F with 1 and 4 degrees of freedom at the 5 per cent level equals 7.71. t (4) equals 2.132 (Hays, 1963). There were no significant results. The error within therapists from pre-test to post-test was not as high as with teachers and principals indicating greater homogeneity of scores for this group. Both experimental and control physical therapists demonstrated 5-8 point decreases in their mean scores from the pre-test to post-test. Table 23 compares the

TABLE 21

ANALYSIS OF VARIANCE AND PLANNED COMPARISONS OF ATTITUDE SCORES OF EQUAL NUMBERS OF EXPERIMENTAL AND CONTROL SPECIAL EDUCATION DIRECTORS

Source of Variation	Sum of Squares	df	Mean Squares	F
Between subjects	8765.19	13		
A (group)	295.69	1	295.69	0.42
Subjects within groups [error (between)]	8469.50	12	705.79	
Within subjects	2339.50	14		
B (treatment)	650.88	1	650.88	4.75*
B X subjects within groups [error (between)]	1644.87	12	137.07	

Planned Comparison	Mean	Mean	Error	df	t
EP-CP	119.29	115.29	705.79	12	.39
Ep-Cp	131.43	122.43	705.79	12	.89
Ep-EP	131.43	119.29	137.07	12	2.74*
Cp-CP	122.43	115.29	137.07	12	1.61

*Sig. at .05

TABLE 22

ANALYSIS OF VARIANCE AND PLANNED COMPARISONS OF ATTITUDE SCORES OF THREE MATCHED PAIRS OF PHYSICAL THERAPISTS

Source of Variation	Sum of Squares	df	Mean Squares	F
Between subjects	2787.44	5		
A (group)	216.69	1	216.69	0.34
Subjects within groups [error (between)]	2570.75	4	642.69	
Within subjects	691.50	6		
B (treatment)	140.06	1	140.06	1.03
B X subjects within groups [error (between)]	544.62	4	136.16	

Planned Comparison	Mean	Mean	Error	df	t
EP-CP	120.33	110.33	642.69	4	.48
Ep-Cp	112.00	105.00	642.69	4	.33
Ep-EP	112.00	120.33	130.16	4	-.89
Cp-CP	105.00	110.33	130.16	4	-.57

change in attitude scores of physical therapists F_{95} (1,10)=4.96. $\pm_{95}$ (10)=1.812 (Hays, 1963).

The results of Tables 22 and 23 do not support the hypothesis that attitude scores of physical therapists are positively changed as a result of frequent educationally oriented communication initiated by the UMMC Pediatric Rehabilitation Team concerning myelodysplastic children with whom the physical therapist is familiar. As Table 23 shows, the mean scores of the physical therapists are similar to those of the teachers and lower than those of the principals and directors.

Occupational Therapists

No pairs of occupational therapists resulted from the matching of students in this study. As with the previous educators, the two-way analysis of variance with one repeated measure and planned comparisons with four occupational therapists and results are shown in Table 24 when F_{95} (1,2)=18.51; $\pm_{95}$=2.132 (Hays, 1963).

Not unlike the previous findings, the occupational therapists showed no significant change as a whole or in their individual groups. The results of Table 24 do not support the hypothesis that a positive change occurs in attitude scores of occupational therapists when frequent, educationally oriented communications are provided by the UMMC Pediatric Rehabilitation Team concerning myelodysplastic children. The small number of physical and occupational therapists makes a meaningful analysis of other attitude scores difficult.

In general, the results did not support the hypothesis that written communication positively affects the attitude scores of educators working with myelodysplastic children in their schools. Special

TABLE 23

ANALYSIS OF VARIANCE AND PLANNED COMPARISONS OF ATTITUDE SCORES OF EQUAL NUMBERS OF EXPERIMENTAL AND CONTROL PHYSICAL THERAPISTS

Source of Variation	Sum of Squares	df	Mean Squares	F
Between subjects	5191.38	11		
A (group)	204.19	1	204.19	0.41
Subjects within groups [error (between)]	4987.19	10	498.72	
Within subjects	1422.00	12		
B (treatment)	54.00	1	54.00	0.41
B X subjects within groups [error (between)]	1319.94	10	131.99	

Planned Comparison	Mean	Mean	Error	df	t
EP-CP	118.67	110.00	498.72	10	.67
Ep-Cp	118.83	115.83	498.72	10	.23
Ep-EP	118.83	118.67	131.99	10	.02
Cp-CP	115.83	110.00	131.99	10	.88

TABLE 24

ANALYSIS OF VARIANCE AND PLANNED COMPARISONS OF ATTITUDE SCORES OF EQUAL NUMBERS OF EXPERIMENTAL AND CONTROL OCCUPATIONAL THERAPISTS

Source of Variation	Sum of Squares	df	Mean Squares	F
Between subjects	12047.37	3		
A (group)	1891.12	1	1891.12	0.37
Subjects within groups [error (between)]	10156.25	2	5078.13	
Within subjects	530.50	4		
B (treatment)	91.13	1	91.13	0.42
B X subjects within groups [error (between)]	433.25	2	216.62	

Planned Comparison	Mean	Mean	Error	df	t
EP-CP	95.50	124.50	5078.13	2	-.40
Ep-Cp	100.50	133.00	5078.13	2	-.45
Ep-EP	100.50	95.50	216.62	2	.33
Cp-CP	133.00	124.50	216.62	2	.57

education directors did demonstrate a significant attitude score change but not in the order of magnitude predicted nor relative to the matched pairs of children.

The educators were not matched on any dimension other than matched student subjects. In order to determine whether such variables as age and sex influenced the results, the attitude scores of educators were compared as to group, sex, and age (under 40 and over 40 years old); these results are shown in Table 25.

TABLE 25

MEAN CHANGES IN ATTITUDE SCORES OF EDUCATORS RELATIVE TO AGE, SEX, AND GROUP

Sex	No., Mean Change, and Variance	Age			
		Under 40		Over 40	
		E	C	E	C
Male	N	12.0	16.0	5.0	9.0
	Mean change	3.7	5.3	14.2	-2.0
	$\sigma^2_{M_D}$	14.8	14.8	12.6	34.2
Female	N	16.0	16.0	18.0	14.0
	Mean change	1.4	3.0	6.3	4.4
	$\sigma^2_{M_D}$	19.3	20.6	18.0	17.4

The number in each cell is small for meaningful statistical analysis but some trends in mean changes in attitude scores and variances of the mean gains of the educators are apparent. The older males in the experimental group demonstrated the greatest mean attitude score change and the younger experimental female demonstrated the smallest change; the older control males showed a mean decrease in attitude score of two points. In general, observed differences in pre-test and post-test attitude score changes between male, female, experimental, and control educators under 40 years of age and over 40 years of age were not very great.

Relationship of Attitudes of Educators to Selected Characteristics of Myelodysplastic Subjects

The Intercorrelation Program for Data with Missing Information was used to test the last four hypotheses stated in Chapter III. Product moment correlations resulted. Table 26 shows the correlations of pre-treatment ATDP scores of the various educators with students' intelligence quotient, chronological ages, physical independence, and social functioning.

TABLE 26

RELATIONSHIP OF ATTITUDE SCORES AND SELECTED VARIABLES OF MYELODYSPLASTIC SUBJECTS

Educator ATDP Score	Student Variables			
	CA	IQ	SQ	Severity of Disability
Teacher	-.178	.356**	.446*	-.387*
Principal	-.147	.398***	.349***	-.399***
Special ed. dir.	.024	.069	-.074	.568***
Physical therapist	-.164	.053	.274	-.240
Occupational therapist	-.015	-.112	.347	-.758

*Sig. at .005
**Sig. at .01
***Sig. at .05

Table 26 indicates that the attitude scores of teachers and principals were positively related to intelligence, social maturity, and negatively related to disability in the directions predicted. The attitudes of special education directors were related only to the degree of disability in this sample but in an opposite direction than predicted. The special education directors tended to be more accepting of the more severely impaired children.

The four selected subject variables were not related to the attitude scores of either group of school therapists.

The results support the hypothesis that attitude scores of educators are positively related to intelligence scores, social maturity, and level of physical independence. The results do not support the hypothesis that there is a relationship between attitudes of educators and chronological age of myelodysplastic subjects such that younger subjects evoke more accepting attitudes in teachers, principals, special education directors, and school therapists.

Other Relationships

Relationships of Attitude Scores to Selected Characteristics of Educators

In order to assess agreement in attitude scores of the various educators by role, the pre-test ATDP scores were compared. Table 27 shows these data.

TABLE 27

CORRELATION OF EDUCATOR ATDP SCORES

Role	OT	PT	Director	Prin.
Teacher	-.478	.209	-.060	.377
Principal	-.153	.180	.578	
Director	-.866	-.584		
PT	.455			
OT				

Findings in Table 27 are consistent with data presented in Table 26.

Further comparisons were made between attitude scores of the educators and selected myelodysplastic subject and educator variables. Table 28 shows these data for teachers, Table 29 for principals, Table 30 for special education directors, Table 31 for physical therapists, and Table 32 for occupational therapists.

As the tables show, the only relationship of significance was a positive correlation between the attitude scores of teachers and their

contact with myelodysplastic students and the younger the teacher, the more accepting his attitudes.

TABLE 28

RELATIONSHIP OF TEACHER ATDP SCORES TO SELECTED CHARACTERISTICS

VARIABLES	Level of Education	No. of previous Children with Myelodysplasia	Job Satisfaction	Age	Marital Status
ATDP score	-.084	.315*	-.165	-.305*	-.032
Marital status	.351	-.129	-.234	.111	
Age	.089	-.111	-.085		
Job satisfaction	-.057	.172			
No. of children in classroom with myelodysplasia	-.084				
Level of education					

TABLE 29

RELATIONSHIP OF PRINCIPAL ATDP SCORES TO SELECTED CHARACTERISTICS

VARIABLES	Level of Education	Job Satis-faction	Age	Marital Status
ATDP score	.262	.078	-.471	-.115
Marital status	.332	-.232	.251	
Age	-.029	-.207		
Job satisfaction	.097			
Level of education				

*Sig. at .05

TABLE 30

RELATIONSHIP OF SPECIAL EDUCATION DIRECTOR ATDP SCORES TO SELECTED CHARACTERISTICS

VARIABLES	Level of Education	No. of previous Children with Myelodysplasia	Job Satis-faction	Age	Marital Status
ATDP score	-.131	-.307	.106	.172	.047
Marital status	-.124	-.071	-.288	-.218	
Age	.095	-.218	-.080		
Job satisfaction	.182	-.288			
No. of previous children in classroom with myelodysplasia	-.124				
Level of education					

TABLE 31

RELATIONSHIP OF PHYSICAL THERAPIST ADTP SCORES TO SELECTED CHARACTERISTICS

VARIABLES	Level of Education	Job Satis-faction	Age	Marital Status
ATDP score	-.430	-.041	.349	.522
Marital status	-.284	-.177	.606	
Age	-.207	.127		
Job satisfaction	.108			
Level of education				

TABLE 32

RELATIONSHIP OF OCCUPATIONAL THERAPIST ATDP SCORES TO SELECTED CHARACTERISTICS

VARIABLES	Level of Education	No. of previous Children in Class with Myelodysplasia	Job Satis-faction	Age	Marital Status
ATDP score	.999	.560	-.502	-.555	.137
Marital status	.999	-.612	-.612	-.102	
Age	.999	-.667	.167		
Job satisfaction	.999				
Level of education	.999				

Relationships of Selected Myelodysplastic Subject Characteristics

Since little data are available regarding myelodysplastic children, especially those in school programs, several characteristics were selected for comparison. Table 33 presents coefficients of correlation of these relationships. Data presented in this table show that there is a significant relationship between intelligence, social maturity, severity of disability, and degree of neurologic deficit, but not related to the repair of the primary defect or age at time of starting school.

Other Relationships Between Educator Attitude Scores and Characteristics of Myelodysplastic Children

It was anticiapted that teachers and principals in special education programs would have more accepting attitudes than their counterparts in regular programs. Table 34 shows the matched pair comparison pre-test attitude scores for teachers and Table 35 for principals.

TABLE 33

RELATIONSHIPS OF MYELODYSPLASTIC SUBJECT CHARACTERISTICS

Variables	Variables								
	CA	Sex	School Starting	Hydro-cephalus	Repair of Defect	Ambulation Status	Level of Lesion	Degree of Disability	SQ
IQ	-.009	.222	-.135	.474*	-.095	-.428*	.513*	.574*	.739*
SQ	-.075	-.064	-.229	.577*	-.059	-.622*	.668*	.718	
Severity of disability	.073	.177	.289**	-.479*	.000	.753*	-.770*		
Level of lesion		-.105	-.142	.486*	.030	-.653*			
Ambulation status	.018	.182	.230	-.417	.121				
Repair of defect		.079	.121	.080					
Hydrocephalus		.152	.025						
School starting									
Sex									
CA									

*Sig. at .002
**Sig. at .05

TABLE 34

MATCHED PAIR t-TEST ON ATTITUDE SCORES OF REGULAR AND SPECIAL CLASSROOM TEACHERS

Class	N	Mean	Sigma	t	P
Regular	29	124.40	5.15	-3.91	.001
Special	29	105.13			

TABLE 35

MATCHED PAIR t-TEST ON ATTITUDE SCORES OF PRINCIPALS IN REGULAR AND SPECIAL EDUCATION

Class	N	Mean	Sigma	t	P
Regular	16	127.13	5.36	-1.56	.1
Special	16	115.94			

The results show that regular teachers tend to be more accepting of these myelodysplastic subjects than the special education teacher. Comparing the 19 subjects in regular classrooms as to degrees of disability, it was found that of the 17 in the regular classrooms, only two were classified as severely disabled compared to 36 in special programs which may account for the attitudes expressed (Table 36).

TABLE 36

RELATIONSHIP OF SEVERITY OF DISABILITY TO SCHOOL PLACEMENT OF MYELODYSPLASTIC CHILDREN

Class	Disability		N	X^2
	Less Severe	More Severe		
Regular	17	2	19	34.2884*
Special	3	36	39	
Total	20	38	58	

*Sig. at .001 with Yate's correction

Likewise the principals of regular schools tended to be more accepting than those having special programs but less so than the teachers.

Since Haring (1958) found least acceptance by educators of children with toilet problems, a comparison of attitudes was made between the bladder status of the myelodysplastic subjects and the pre-test attitude scores of each educator group. Table 37 shows the results when attitudes were grouped above (high) and below (low) the group mean and bladder status was continent, incontinent, or urinary diversion.

TABLE 37

RELATIONSHIP BETWEEN ATTITUDE SCORES OF EDUCATORS AND BLADDER STATUS OF MYELODYSPLASTIC SUBJECTS

Role	ATDP Score	Bladder Status			N	Mean	X^2	P
		Continent	Urinary Diversion	No Diversion				
Teacher	High	2	20	10	32	116.0	.05	N.S.
	Low	1	10	13	24			
Principal	High	1	11	13	25	118.7	.02	N.S.
	Low	2	7	9	18			
Director	High	3	5	7	15	117.3	.09	N.S.
	Low	0	4	3	7			
PT	High	1	2	9	12	114.3	.11	N.S.
	Low	2	4	4	10			
OT	High	1	0	2	3	110.0	.03	N.S.
	Low	1	0	1	2			

Chi-squares were computed using Yate's correction. There was no significant relationship between attitude scores of educators and the

state of continence of the myelodysplastic subjects. A comparison was made between educator mean attitude scores and the presence or absence of a urinary diversion. Table 38 shows these relationships using the same criteria for attitude scores as in Table 37.

TABLE 38

RELATIONSHIP BETWEEN ATTITUDE SCORES OF EDUCATORS AND PRESENCE OF A URINARY DIVERSION IN THE MYELODYSPLASTIC SUBJECTS

		Urinary Status					
Role	ATDP Score	Urinary Diversion	No Diversion	N	Mean	X^2	P
Teacher	High	20	10	30	116.0	1.98	N.S.
	Low	10	13	23			
Principal	High	11	13	24	118.7	.04	N.S.
	Low	7	9	16			
Director	High	5	7	12	117.3	.03	N.S.
	Low	4	3	7			
PT	High	2	9	11	114.3	.95	N.S.
	Low	4	4	8			
OT	High	0	2	2	110.0	6.75	.01
	Low	0	1	1			

The chi-squares were computed using Yate's correction. The chi-squares were not significant except in the case of the OTs whose N was very small. In general, attitude scores were not related to the methods of managing urinary incontinence (diapers or diversion).

The same comparisons were made to see if a relationship existed between degree of acceptance (above and below mean ATDP pre-test) and

ambulation status of the myelodysplastic subjects, (ambulatory, A, or non-ambulatory, NA). Two by 2 chi-square tables produced the results for the various educators reported in Table 39. All chi-squares were computed using Yate's correction.

TABLE 39

RELATIONSHIP BETWEEN ATTITUDE SCORES OF EDUCATORS AND AMBULATION STATUS OF MYELODYSPLASTIC SUBJECTS

Role	ATDP Score	Ambulation Status A	NA	N	Mean	X^2	P
Teacher	High	25	8	33	116.0	1.43	.25
	Low	15	11	26			
Principal	High	14	8	22	118.7	.02	N.S.
	Low	12	6	18			
Director	High	6	8	14	117.0	3.13	.1
	Low	8	1	9			
PT	High	3	7	10	114.0	.21	N.S.
	Low	5	5	10			
OT	High	4	0	4	110.0	2.13	.25
	Low	1	3	4			

Computing the chi-squares according to Yate's correction produced low levels of significance between teacher, director, and OT pre-test attitude scores and ambulatory status. The teachers and OTs were more accepting of ambulatory subjects while the directors were more accepting of the non-ambulatory subjects.

CHAPTER VI

DISCUSSION

The University of Michigan Medical Center Pediatric Rehabilitation Team has as one of its responsibilities, the provision of comprehensive health care for myelodysplastic children. Experience of the Rehabilitation Team at the UMMC indicates that the multiple medical, surgical, and allied health needs of the myelodysplastic population cannot be met by a single discipline working alone. Similarly, educational personnel recognize the usefulness of the team approach in the school community in meeting the complex educational needs of the multihandicapped. Improved medical management is reducing the mortality rate in cases of myelodysplasia so that better prepared educators and improved facilities are essential to make school attendance possible for these multihandicapped children. To effect adequate and appropriate medical, educational, and vocational programming, school personnel must be included in the habilitation process as early as possible. Opportunities must be provided to share knowledge with medical personnel so that available resources may be utilized more efficiently in attaining mutual objectives.

No formal relationship exists between the UMMC Pediatric Rehabilitation Unit and local schools at the present time. Information is provided to school personnel only upon request. Local physicians are kept better informed since a UMMC policy exists requiring a UMMC physician to send an annual out-patient letter to the child's referring physician. This letter summarizes care provided by University Hospital

during the previous year. If the child is hospitalized during the year, a hospital discharge summary letter is sent to the referring physician and designated agencies such as local public health departments. Educators do not routinely receive this information. Letter writing has been the accepted method of communication since time and distance must be considered. In attempting to establish communication between the school and medical community, the methods remained the same for purposes of this study. However, the procedure was altered to make communication a joint product of all rehabilitation personnel involved whenever possible rather than the responsibility of the physician alone.

In selecting information to share with educators, consideration was given to the various educational settings in which the myelodysplastic children were located as well as to the known educational objectives for each child in his placement. Written communications were planned and directed to regular and special educators so that feedback and involvement were encouraged in a non-threatening way. In this study, little feedback in the form of written or verbal responses from educators resulted. It is possible that too much one-way communication reached regular and special educators without adequate preparation for using the information. In addition, no attempt was made to determine whether materials were read and understood by the educators nor was it possible to assess to what extent recommendations concerning a particular child were carried out in the local school program. It is possible that no use was made of the written communication which may account in part for the lack of evidence found in this study for influencing attitude change in a positive direction. The actual person from a medical setting communieating

with educators may be important also. Perhaps the physician is the best person to initiate communication since he has the least direct counterpart in the school setting. Perhaps the pediatric rehabilitation social worker, nurse, psychologist, physical therapist, and others are too often identified as representing a single professional discipline rather than a team. Finally, the possibility exists that a trained teacher or special educator as a full-time team member may be desirable for such activities.

Since professional disciplines are attached to names on written communications, and this may bias the receiver, perhaps letters to educators should be noted as coming only from the Pediatric Rehabilitation Unit. Then an assigned team member at the UMMC can respond appropriately but with greater anonymity than was done in this study. Written communications directed to schools often by-pass the desk of the intended receiver and are filed in a child's cumulative folder without being seen by the school personnel most concerned with his program. Therefore, communications should be directed to the attention of a specific person. Perhaps after a line of communication has been established between the educational and medical communities, the appropriate persons by whom such communications should be sent and to whom they should be directed may evolve.

The varied settings and school policies concerning placements, as well as the wide variations in acceptance of disabled persons among educators performing similar roles, may account for the large variance and measurement errors found in this study. While it is not possible to make broad generalizations concerning the findings, there is some evidence that the use of written communication with educators may not be effective.

Although it was not the primary intent in this investigation to study the myelodysplastic students, several pertinent observations may be made from the data. The 58 children included in this study tended to be either in regular classes or programs for the physically handicapped with the decision apparently made on the basis of severity of the physical disability and intelligence. Most myelodysplastic subjects in this study were not over-age at the time of beginning school. This may reflect improved efforts of parents, educators, and rehabilitation personnel to avoid delays in school admission. It may also reflect the effectiveness of the increasing numbers of pre-school programs for the physically handicapped. The primary objective of such programs is to enhance socialization, self-care, and evaluation in preparation for an appropriate school placement. In the past, parents were expected to prepare their children in these areas with minimal assistance from either school or medical personnel. In many cases this was not accomplished so that delayed school admission or exclusion was a common practice.

Orthopedic surgery for dislocated hips and paralytic foot deformities was common in this sample. Ambulation was minimal in those children who did not have surgical correction of their dislocated hip and/or foot deformities but they were the more severely disabled children. Further, nearly one-third of the children were mobile only with the use of a wheelchair, and another one-third ambulatory only with the use of crutches and braces, indicating that apparently architectural barriers in schools have been overcome and transportation problems have been reduced for at least some of the more severely handicapped.

It would seem from this study that once school placement has been achieved, the degree of ambulation is not strongly related to the attitude scores of the educators. There was a tendency for the teachers and

principals to demonstrate more positive attitude scores toward the ambulatory children while the special education directors were more accepting of the non-ambulatory children. This might be explained on the basis that the special education director is more concerned with transportation to and from school rather than activities within the school. Even though urban-rural distribution was equal in the population, and data were not collected on myelodysplastic subjects not in school, it may be anticipated that the more severely disabled not in school reside in rural areas lacking adequate transportation facilities.

Significant relationships were found between a myelodysplastic child's IQ, SQ, presence of hydrocephalus, severity of disability, ambulation status, and the spinal level of his myelomeningocele. The more intellectually and socially competent child without evidence of hydrocephalus and lower level of lesion was more often ambulatory without any aids and seemingly better accepted by the educators. Controlled studies with larger numbers of myelodysplastic children would be necessary to predict the degree of independence and acceptance of a child on the basis of competency in each of these areas mentioned. Such knowledge would greatly enhance medical, educational, and vocational programming as well as training programs for the various disciplines involved with these children.

All but three children in this study had bowel and bladder incontinence. This probably indicates less school exclusion on the basis of bowel and bladder function than was the case in previous years. There was no relationship between the attitudes of educators and urinary and fecal incontinence of the myelodysplastic children. The only significant relationship of bladder status was found in the small OT group

who showed more positive attitudes toward those incontinent children having no urinary diversion. This may reflect that the OT is often assigned the difficult task of devising ways and means of keeping urinary diversion devices attached to the abdomen of a child or keeping it from leaking.

The most common associated medical problems in the myelodysplastic population were contractures and scolioses due to paralysis, mild cerebral palsy, and obesity. All of these have implications for educational planning and family education. Since the complications of paralysis begin long before school age, it is important that parents be taught how to carry out effective prophylactic exercise programs. Similarly, in the less active child, obesity is a predictable problem about which families should be made aware early in the habilitation process. If medical personnel could educate parents to follow programs for prevention of deformities and complications from the outset, and primary physical maintenance were the responsibility of the parents, school therapists could spend more time in maximizing physical function in the school and home environment, providing adaptations to minimize the physical handicap, and educating the parents in these activities.

It was anticipated that attitudes of educators would be positively related to intelligence, social maturity, and level of physical independence and a negative relationship with increasing age of the subjects. In the teacher and principal groups significant relationships were found, except between age and attitude. It is possible that the dependence in younger children is viewed no differently by educators than dependence in older children. However, in this study, there were only four children who were over 12 years of age and above

the sixth grade level. The attitudes of special education directors were also positively related to severity of disability but in an opposite direction from the teachers and principals. The directors were more accepting of the more disabled children. This may be related to their role difference and less face-to-face involvement with the children. Teachers and principals face daily problems of wheelchairs and crutches, whereas the directors are primarily concerned with transportation and placement and have minimal responsibility for daily care of the children.

A significant relationship existed between the attitude scores of teachers and both their age and extent of contact with myelodysplastic subjects. Greater contact evoked more positive attitudes; younger teachers expressed more positive attitudes than other educators. This latter finding may indicate that current teacher training programs include in the curriculum increased information regarding myelodysplastic children or multihandicapping problems which would contribute toward greater understanding and acceptance of exceptionalities. It also may be that younger teachers with their enthusiasm, motivation, and creativity, have experienced fewer failures in attempted adaptations in classroom activities for the severely handicapped. Those educators in this study who have the most concentrated contact on a personal basis and greater medical training, namely, the PTs and OTs, demonstrated the least acceptance of these children. This finding is not consistent with the expectation that increased contact and increased information level results in increased acceptance. It is possible that decreased acceptance in the case of the therapists reflects a reaction to receiving written communication from an investigator who is identified with their discipline.

Data from this study seemed to indicate that regular educators demonstrated more accepting attitudes toward disability than special educators. However, regular educators were dealing with less severely handicapped children. Presumably the preparation of special educators includes content and practice in physical management of severely impaired children which should contribute to a more accepting attitude. Inspection of educational levels, special education approvals, and years of experience in special education programs, indicated that this educator sample had extensive preparation but there is no way of knowing to what extent this preparation included content and practice in physical management. Deficiencies in their preparation may account for the difference found in this study.

There was no relationship between the attitude scores of the various educators by role in this study. This may be the result of the heterogeneity of this educator sample. The number was too small to analyze the data by school setting in addition to role. Although special education directors seemed to be the most accepting of myelodysplastic children, their contacts tend to be less personal and more administrative in nature.

With regard to the seeming lack of attitude score change in this study, the adequacy of instrumentation is important. The primary purpose in this study was to measure change. For such comparisons before and after a treatment with an experimental and control group this ADTP scale seemed to be appropriate. The degree of the attitude expressed by each ATDP item is not known so that absolute interpretation of the raw scores is not possible (Yuker, et al., 1966). Nonetheless, data for the present population were similar to the normative data presented by Yuker, et al., 1966, p. 28). The present group was assumed

to have greater homogeneity and acceptance of children than the general population but this was not the case. The observed sex differences were not significant in the present study but the number of males was quite small making comparisons difficult. Use of criterion groups of regular and special educators who have had no contact with myelodysplastic children may have been beneficial in assessing mean scores of attitudes. Figure 3 shows a graphic description of the mean scores of each experimental and control group of educators on the ATDP Form-B pre-test and Form-A post-test who were included in the data analysis of equal pairs of educators (N=64). Figure 4 shows the same information on all of the educators included in this study paired and not paired (N=104). The observed pre-test and post-test scores seem to indicate moderate acceptance of educators but that the treatment had no affect in changing their attitude scores.

Another important factor in the research design was the length of the study. One semester was selected as adequate for data collection with the educator subjects. It is possible that a longer time would have produced different results. It may not be feasible or possible for teachers and other educators to incorporate and utilize such concentrated communication activities as were used in this study into their weekly or monthly schedules. It is possible that educators working with myelodysplastic subjects are expressing more acceptance at the outset so that raising their information level alone does not produce a positive change. Perhaps basic changes in personality structure of educators and concepts of disability must be made to yield greater educator acceptance and increased motivation for involvement with the medical community. The following factors independently or in combination may contribute to the

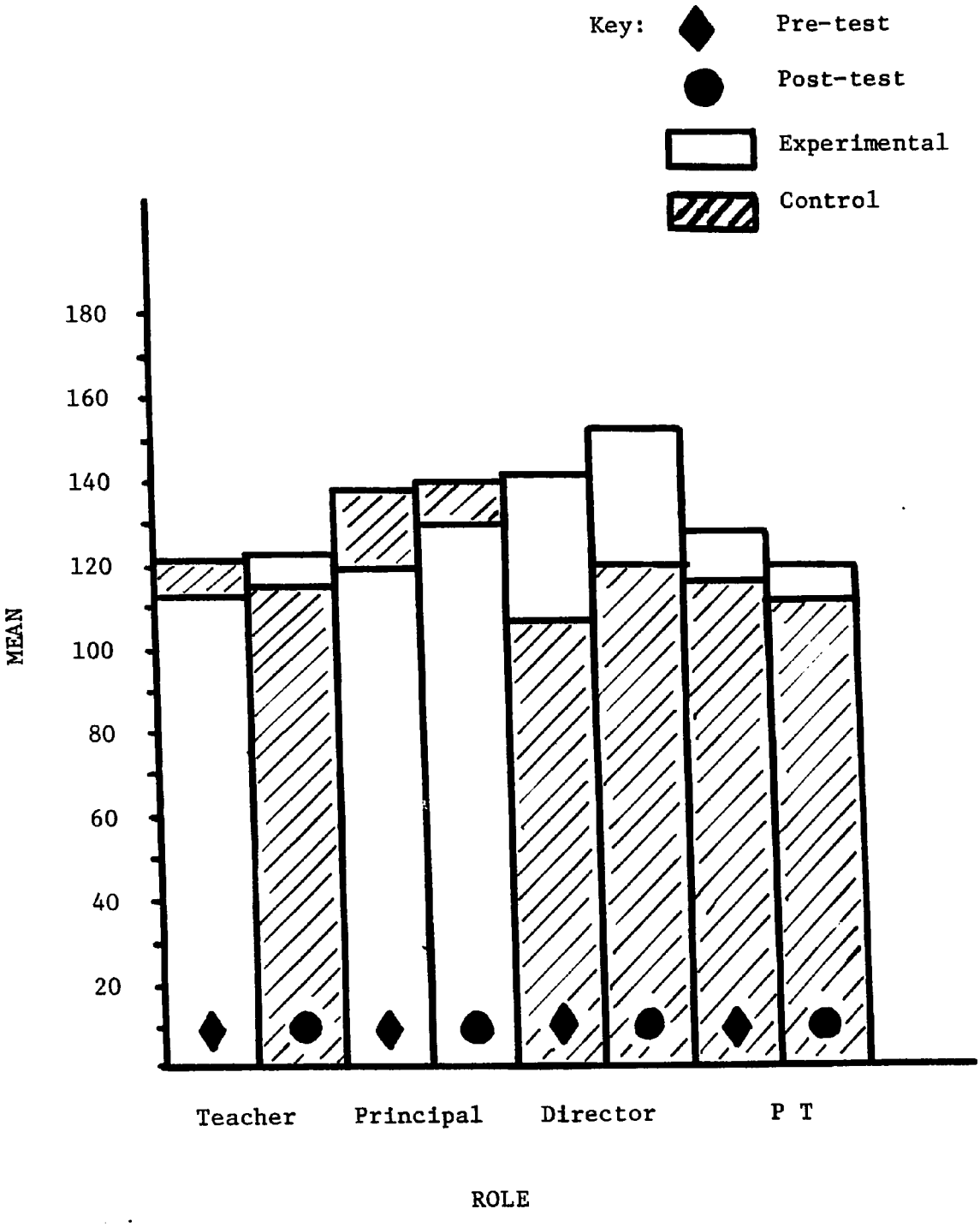


Fig. 3 Paired educators pre-test and post-test ATDP means by group.

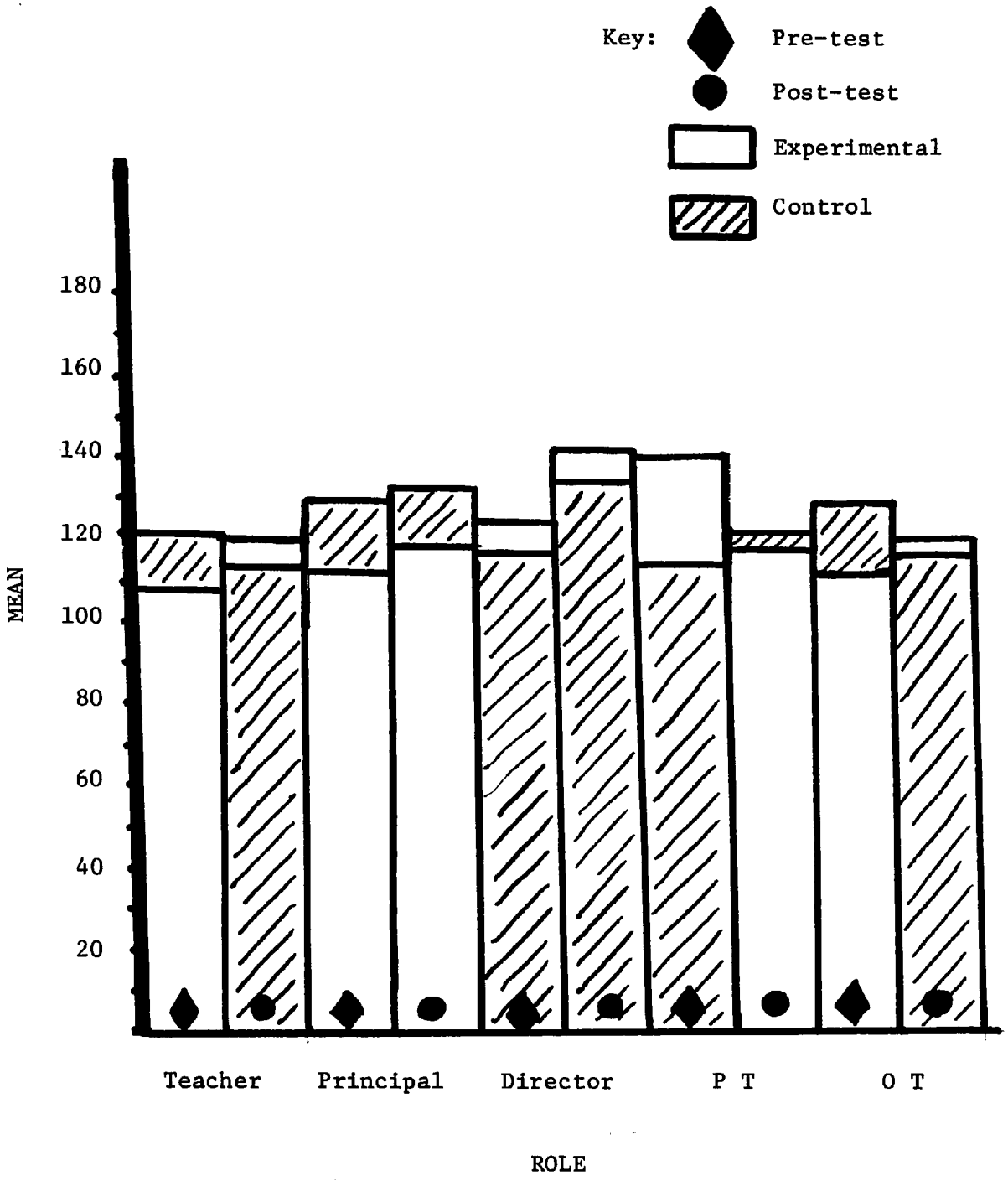


Fig. 4 All educators pre-test and post-test ATDP means by group.

desired changes: educator training programs need to include more medical information course work to raise the teacher's sophistication and ability to use shared information in achieving educational objectives; educational objectives having medical overtones should be defined cooperatively by educators in the local community and those in the medical community; field placements in training programs should include participation of educator trainees in rehabilitation team settings in addition to their practice teaching.

Multidisciplinary training programs for health and educational professions might contribute to a common body of knowledge thereby increasing the homogeneity of all groups and establishing more common bases for educational planning. Considering the geographical distribution of the subjects, mobile clinics taking the rehabilitation team from the University to the community may be more economical and profitable in establishing more effective working relationships. This is certainly worthy of investigation. An alternative plan is providing more in-service activities for educators in the University setting and centered around children of mutual concern.

CHAPTER VII

SUMMARY AND CONCLUSIONS

Myelodysplastic children are illustrative of a disability group considered multihandicapped by medical and educational standards. As medical management continues to improve and educational programming becomes more diverse, increasing numbers of these children will be enrolled in school settings. The multiple impairments imposed by myelodysplasia necessitates an habilitation program involving medical and educational personnel throughout. The primary purpose of this study was to determine to what extent written communication is effective in establishing a meaningful link between the educational and medical communities dealing with myelodysplastic children and thereby positively changing the attitudes of educators toward these children by increasing the information level of the various persons involved.

The hypotheses tested were:

1. A positive change in attitudes of teachers, principals, special education directors, physical therapists, and occupational therapists results when frequent, educationally oriented written communications are initiated by a medically-centered pediatric rehabilitation team and shared with these educators; greatest attitude changes occur in teachers followed by principals, special education directors, physical therapists, and occupational therapists.

2. There is a positive relationship between the attitudes demonstrated by teachers, principals, special education directors,

physical therapists, and occupational therapists and the intelligence and social maturity and a negative relationship with chronological age and severity of disability of children with myelodysplasia; higher levels of intelligence, social functioning, younger ages, and less severe physical disability evoke more positive attitudes.

For purposes of this study, 58 myelodysplastic children who are currently enrolled in schools in Michigan were identified and matched on the basis of chronological age, mental age, and sex. The 143 educators involved in their educational programming were identified by role for each matched pair of children and became the experimental and control groups of subjects.

The instrument used for measurement of attitude score change in the educator groups was the Attitude Toward Disabled Persons Scale (ATDP). In the myelodysplastic group, intelligence was measured on the Stanford-Binet Form L-M Scale; social maturity was measured on the Vineland Social Maturity Scale; severity of disability was measured by the Assessment of Physical Disability Scale from Rehabilitation Codes.

The ATDP Form B was used as the pre-test measure of educator attitudes during December, 1967. The experimental group of teachers, principals, directors, and therapists received frequent, educationally oriented written communications in the form of letters and educational reprints regarding the myelodysplastic children. After six months, Form A of the ATDP was administered to all educators as the post-test measure. Both scales were administered by mail.

The principle findings were:

1. The various educators concerned with myelodysplastic children demonstrated attitudes which were neither strongly positive

nor strongly negative; these attitudes in the experimental group were not significantly changed when attempts were made to increase their information level.

2. There was no relationship between the attitude scores of the various educators by role.

3. Of the various roles represented, special education directors demonstrated the most significant change in attitudes followed by principals, teachers, and therapists in that order but of magnitudes which did not approach significance.

4. There was a significant correlation between the attitude of teachers and the amount of contact they had with myelodysplastic children.

5. Educators having the most face-to-face contact with myelodysplastic children (teachers and principals) had attitudes regarding these children which were positively related to intelligence and social maturity, and negatively related to the severity of physical disability.

6. There were positive relationships between the IQ, SQ, presence of hydrocephalus, and the ambulation status of the myelodysplastic children, and negative relationships with severity of disability.

7. The ambulation status or lack of bowel and bladder control did not preclude school admission for the myelodysplastic children.

The results of this study suggest the following implications for further research:

1. Since there was some evidence found in the present study of the success of pre-school programs for the orthopedically handicapped, a follow-up study is indicated to determine to what extent differences exist in the attitudes of elementary school educators toward the children who did and did not have such a pre-school experience.

2. The results of this study did not give support to the effectiveness of the present method for establishing a two-way communication system between the medical community and school personnel. Therefore, the UMMC Pediatric Rehabilitation Team must investigate other methods to accomplish this objective and incorporate the educators of myelodysplastic children into their team.

3. No attempt was made to study the educational achievement of the myelodysplastic subjects in this study. In view of the variety of school placements represented in this sample, such an investigation is indicated.

4. This study did not investigate the criteria for school placements of myelodysplastic children. Since there was evidence of little mobility within the special education placements suggesting little progress in overcoming categorical labeling, additional studies are in order to make these determinations.

5. There was no attempt made to determine the attitudes that myelodysplastic children have about themselves, to what degree these attitudes influence those of educators, or to what degree the attitudes of educators influence the behavior of myelodysplastic children. Projective techniques for determining self-concepts and personality structure may provide useful data in these determinations.

APPENDIX A

TABULAR DESCRIPTION OF STUDENT CHARACTERISTICS

APPENDIX A

TABULAR DESCRIPTION OF STUDENT CHARACTERISTICS

Student	Sex	C.A. (years)	M.A. (years)	S.A. (years)	Socioeconomic level	Level of lesion	Mobility status	Myelomeningocele repaired	Hydrocephalus	Holter valve	Urinary diversion	Other orthopedic and neurosurgery	Associated problem	Grade in school	School placement
2-C	F	8.08	6.58	4.70	21	L-2	w c	+	+	+	-	-	-	x	o s
2-E		8.15	5.75	4.67	19	T-2	w c	+	+	+	-	+	+	k	h
3-C	F	8.08	7.25	7.80	15	L-4	a b c	+	+	+	+	+	-	2	r
3-E		7.75	6.42	5.00	21	T-6	w c	+	+	+	-	-	+	2	o r
4-C	F	7.15	6.75	6.30	11	S-1	a	+	+	+	-	-	-	1	r
4-E		6.42	6.42	6.33	32	L-5	a b c	+	+	+	+	-	-	k	r
5-C	F	9.42	6.00	7.20	33	S-1	a	+	+	+	+	+	-	u	m r
5-E		8.75	5.42	6.50	12	L-5	a	+	+	+	+	+	-	u	o r
7-C	F	11.83	9.58	11.00	21	L-3	w c	+	+	-	+	-	+	4	o s
7-E		11.67	9.50	11.67	9	L-2	a b c	+	+	+	+	-	-	3	o r
8-C	F	9.60	10.33	13.83	49	S-2	a	+	-	-	+	-	-	3	r
8-E		8.40	8.08	10.50	50	L-5	a	+	+	+	-	-	-	2	r
9-C	F	6.92	6.25	6.50	76	L-3	a b c	+	+	-	+	+	-	1	r
9-E		6.42	6.00	9.30	23	L-5	a	+	-	-	-	-	-	k	r
11-C	F	7.42	7.08	8.50	2	S-2	a	-	-	-	+	-	-	1	r
11-E		6.80	6.50	10.30	12	S-2	a	-	-	-	-	-	-	1	r

APPENDIX A--Continued

Student	Sex	C.A. (years)	M.A. (years)	S.A. (years)	Socioeconomic level	Level of lesion	Mobility status	Myelomeningocele repaired	Hydrocephalus	Holter valve	Urinary diversion	Other orthopedic and neurosurgery	Associated problem	Grade in school	School placement
12-C	F	14.80	7.52	5.60	40	L-2	w c	-	+	+	-	+	+	u	d c
12-E		13.60	8.90	3.70	21	T-6	w c	+	+	+	+	+	+	u	h
14-C	F	3.90	3.60	2.70	21	L-3	a b c	+	+	+	+	-	-	p	o s
14-E		4.00	3.90	3.00	39	L-4	w c	+	+	+	-	-	-	p	o s
19-C	M	6.90	6.30	7.00	49	L-2	w c	+	+	+	-	-	-	1	o s
19-E		6.60	6.40	8.50	14	S-1	a	+	-	-	+	-	-	k	r
20-C	M	8.40	10.10	10.70	16	L-4	a b c	+	-	-	-	+	-	2	o r
20-E		8.50	9.50	7.80	21	L-2	a b c	+	-	-	-	-	+	3	o r
22-C	M	9.20	5.70	6.30	21	L-5	a b c	+	+	+	-	+	-	2	o r
22-E		9.00	5.00	2.30	33	T-6	w c	+	+	+	-	-	+	u	o r
23-C	M	10.20	8.60	11.00	49	L-2	a b c	+	+	+	-	-	-	4	o r
23-E		9.80	7.20	6.10	33	L-1	w c	+	+	+	-	-	-	3	o r
24-C	M	10.50	9.90	5.20	21	L-4	a b c	+	+	+	+	+	+	1	h
24-E		10.80	10.30	9.30	12	L-5	a b c	+	+	+	-	-	+	4	o r
25-C	M	13.40	8.80	9.00	19	L-2	w c	-	+	-	+	+	+	5	o s
25-E		12.70	6.90	6.80	15	L-5	a b c	+	-	-	+	-	+	k	o s
27-C	M	14.60	12.80	13.30	38	S-2	a	-	+	-	-	+	+	7	v s
27-E		13.80	13.10	15.50	72	L-3	a b c	+	-	-	-	+	+	8	o r
28-C	M	7.80	7.30	7.80	20	L-2	w c	+	+	+	+	+	-	2	o s
28-E		6.90	6.10	8.80	92	L-5	a b c	+	-	-	+	+	-	1	r

APPENDIX A--Continued

Student	Sex	C.A. (years)	M.A. (years)	S.A. (years)	Socioeconomic level	Level of lesion	Mobility status	Myelomeningocele repaired	Hydrocephalus	Holter valve	Urinary diversion	Other orthopedic and neurosurgery	Associated problem	Grade in school	School placement
29-C	M	4.50	4.30	3.50	50	L-4	a b c	+	+	+	-	-	-	p	o s
29-E		4.40	3.80	2.90	51	L-1	w c	+	+	+	-	-	+	p	o r
30-C	M	8.60	10.40	11.30	87	S-1	a	+	+	-	-	+	-	2	r
30-E		8.30	10.70	10.80	54	L-4	a c	+	-	-	-	+	-	2	r
33-C	M	9.60	9.00	11.00	22	S-1	a	+	-	-	+	-	-	3	r
33-E		9.20	8.60	9.00	15	S-1	a	+	-	-	+	-	-	3	r
58-C	M	13.90	11.70	9.60	34	L-5	a b c	+	+	-	-	+	-	u	o r
58-E		13.60	10.20	12.00	35	L-5	a b	+	+	-	-	-	-	5	o r
1-C	F	5.90	3.00	3.60	15	T-8	w c	+	+	-	-	-	+	u	d c
10-C	F	11.80	9.30	8.80	49	T-10	w c	-	+	-	+	+	-	r	o r
13-E	F	13.30	13.90	15.00	15	S-1	a	+	-	-	+	-	-	8	r
17-E	M	6.60	4.90	3.00	54	T-6	w c	+	+	+	+	-	+	k	o r
18-C	M	7.00	7.00	8.80	78	S-1	a	+	-	-	-	-	-	1	r
26-C	M	15.10	19.50	18.60	77	S-4	a	+	-	-	+	-	-	10	r

APPENDIX A--Continued

Student	Sex	C.A. (years)	M.A. (years)	S.A. (years)	Socioeconomic level	Level of lesion	Mobility status	Myelomeningocele repaired	Hydrocephalus	Holter valve	Urinary diversion	Other orthopedic and neurosurgery	Associated problem	Grade in school	School placement
56-E	F	10.10	7.30	7.80	19	L-2	w c	+	+	+	+	+	+	4	o r
57-C	F	4.20	1.80	2.70	51	L-2	w c	+	+	+	-	-	-	p	o s
70-E	F	12.10	12.10	12.50	18	L-2	w c	+	-	-	+	+	-	3	o r
91-C	F	6.90	5.40	x	18	L-5	a b c	+	+	+	-	-	x	1	o r

Key:
- a - ambulatory
- b - braces
- c - crutches
- d c - day care
- h - homebound
- k - kindergarten
- m r - mentally retarded
- o r - orthopedic room
- o s - orthopedic school
- p - pre-school program
- r - regular classroom
- u - ungraded
- v s - vocational school
- w c - wheelchair
- x - unknown
- + - yes
- - - no

APPENDIX B

BIOGRAPHICAL DATA SHEETS

TEACHER DATA

Sex: Male_____ Female_____ Marital Status: M___ S___D___W___

Age: 20-30_____ 31-40_____ 41-50_____ 51 or over_____

Education:

BA_____ MA_____ EdS_____ PhD_____ Other_____

Teacher Certificate: Elementary_____ Secondary_____

Special Education (Mark "F" for full approval and "T" for temporary approval)

_____ Mentally Retarded
_____ Emotionally Disturbed
_____ Speech
_____ Visually Handicapped
_____ Hearing Impaired
_____ Crippled
_____ Hospital Homebound
_____ Other (Specify)

Years of teaching experience: In Special Education_____
In Regular Classroom_____

How many other children with spina bifida do you have or have you had in the past in your class?_____

Do you have a physical disability? Yes____ No____ (If yes, please describe)

Does anyone in your family have a physical disability? Yes____ No____
(If yes, please describe)

How satisfied are you with your present position? (Please check appropriate space)

I----------I----------I----------I----------I----------I

Very Satisifed | Neither Sat.-Dissat. | Very Dissatisfied

PRINCIPAL DATA

Sex: Male____ Female____ Marital Status: M___ S___ D___ W___

Age: 20-30_____ 31-40_____ 41-50_____ 51 or over_____

Education: BA_____ MA_____ EdS_____ PhD_____ Other_____

Teacher Certificate: Elementary_____ Secondary_____

Special Education (Mark "F" for full approval and "T" for temporary approval)

_____ Mentally Retarded
_____ Emotionally Disturbed
_____ Speech
_____ Visually Handicapped
_____ Hearing Impaired
_____ Crippled
_____ Hospital Homebound
_____ Spec. Ed. Supervisor
Other (Specify)_____

Years of teaching experience: In Special Education_____
In Regular Classroom_____

Years of administration: Regular_____ Spec. Ed._____

How satisfied are you with your present position? (Please check appropriate space)

I----------I----------I----------I----------I
Very Satisfied — Neither Sat.-Dissat. — Very Dissatisfied

Check those services for exceptional children available in your school:

No. Students		Spec. Class	Itinerant (Type C)*
_____	Tr. Ment. Retarded	_____	_____
_____	Ed. Ment. Retarded	_____	_____
_____	Emotionally Disturbed	_____	_____
_____	Speech	_____	_____
_____	Physically Handicapped	_____	_____
_____	Homebound	_____	_____
_____	Visually Handicapped	_____	_____
_____	Hearing Impaired	_____	_____
_____	Gifted	_____	_____
_____	School social work	_____	_____
_____	Other_____	_____	_____

Do you have a physical disability? Yes____ No____ (If yes, please describe)

SPECIAL EDUCATION DIRECTOR DATA

Sex: Male _____ Female_____ Marital Status: M___ S___ D___ W___

Age: 20-30_____ 31-40_____ 41-50_____ 51 or over_____

Education: BA_____ MA_____EdS_____ PhD_____ Other_____

Teacher Certificate: Elementary_____Secondary_____

Special Education (Mark "F" for full approval and "T" for temporary approval)

_____Mentally Retarded _____ Hearing Impaired
_____ Emotionally Disturbed _____ Crippled
_____ Speech _____ Hospital Homebound
_____ Visually Handicapped _____ Spec. Ed. Administrator
Other (Specify)_____

Years of teaching experience: In Special Education_____
In Regular Classroom_____

Years in administration: Regular_____ Spec. Ed._____

How satisfied are you with your present position? (Please check appropriate space)

I----------I----------I----------I----------I
Very Satisfied — Neither Sat.-Dissat. — Very Dissatisfied

Check those services for exceptional children available in your school system:

No. Programs		Spec. Class	Itinerant (Type C)*
_____	Tr. Ment. Retarded	_____	_____
_____	Ed. Ment. Retarded	_____	_____
_____	Emotionally Disturbed	_____	_____
_____	Speech	_____	_____
_____	Physically Handicapped	_____	_____
_____	Homebound	_____	_____
_____	Visually Handicapped	_____	_____
_____	Hearing Impaired	_____	_____
_____	Gifted	_____	_____
_____	School social work	_____	_____
_____	Other_____	_____	_____

*Teacher-counselor, helping teacher, crisis teacher, etc.

Do you have a physical disability? Yes____ No____ (If yes, please describe)

Does anyone in your family have a physical disability? Yes___ No___ (If yes, please describe)

PHYSICAL AND OCCUPATIONAL THERAPIST DATA

Position_____ Marital Status: M__ S__ D__ W__

Age: 20-30____ 31-40____ 41-50____ 51 or over____

Education:

BA_____ BS_____ MA_____ MS_____ PhD_____ EdS_____ Other_____

Certification: In O.T._____ In P.T._____ Other_____

Years of experience in the public schools_____

Years of other professional work experience_____

How satisfied are you with your present position (Please check appropriate space)

I----------I----------I----------I----------I

Very Satisfied | Neither Sat.-Dissat. | Very Dissatisfied

Do you have a physical disability? Yes____ No____ (If yes, please describe)

Does anyone in your family have a physical disability? Yes___ No___ (If yes, please describe)

APPENDIX C

INSTRUMENTS

ASSESSMENT OF PHYSICAL DISABILITY (from Rehabilitation Codes)

GENERAL DEFINITIONS

Rehabilitation	is both the concept of a disabled or handicapped individual's optimal achievement of his potential for self-realization, and his assistance therein by the community through organized services directed towards that end.
Impairment	any deviation from the normal which results in defective function, structure, organization, or development of the whole, or of any of its faculties, senses, systems, organs, members, or any part thereof.
Disability	any limitation experienced by the impaired individual, as compared with the activities of unimpaired individuals of similar age, sex, and culture.
Handicap	the disadvantage imposed by impairment or disability upon a specific individual in his cultural pattern of psychosocial, physical, vocational, and community activities.
	An impaired individual is not necessarily disabled or handicapped by the impairment but he may be either disabled or handicapped, or both.
Rehabilitation Potential	the implications of the interplay of all the pro and con factors revealed in evaluation of the individual's assets and liabilities, which affect his capacity for cooperating with rehabilitation services, and the demands of his living environment.
	To determine the most appropriate description, start each category at #9 and read upward, NOT at 0 reading down.

28. Severity of disability. The scale ranges from 0-9 for severity defined in terms of the handicapping effects and the need for adjustment, special care, and specialized facilities.

Severity of disability

0 potential disability only, if the impairment is neglected

1 detectible disability causing no handicap as yet.

2 disability causing handicap in one, or potential handicap in more than one area of living, as yet requiring no significant adjustment of accustomed behavior.

3 disability causing handicap in more than one area, not severe enough to require special adjustment except in personal habits.

4 physical disability severe enough to require special environmental, educational, and/or vocational adjustments but no continuous supervision.

6 physical disability severe enough to require supervision in specialized facilities for some activities: social, educational, vocational.

7 physical disability is involved, handicapping one or more but not all areas, as in 6

9 disability severe enough to enforce complete dependence for all care in a permanently supervised environment.

ATTITUDE TOWARD DISABLED PERSONS SCALE
FORM A

READ EACH STATEMENT AND PUT AN "X" IN THE APPROPRIATE COLUMN ON THE ANSWER SHEET. DO NOT MAKE ANY MARKS ON THE QUESTION SHEETS.

PLEASE ANSWER EVERY QUESTION

1. Disabled people are often unfriendly.
2. Disabled people should not have to compete for jobs with physically normal persons.
3. Disabled people are more emotional than other people.
4. Most disabled persons are more self-conscious than other people.
5. We should expect just as much from disabled as from non-disabled persons.
6. Disabled workers cannot be as successful as other workers.
7. Disabled people usually do not make much of a contribution to society.
8. Most non-disabled people would not want to marry anyone who is physically disabled.
9. Disabled people show as much enthusiasm as other people.
10. Disabled persons are usually more sensitive than other people.
11. Severely disabled persons are usually untidy.
12. Most disabled people feel that they are as good as other people.
13. The driving test given to a disabled person should be more severe than the one given to the non-disabled.
14. Disabled people are usually sociable.
15. Disabled persons usually are not as conscientious as physically normal persons.
16. Severely disabled persons probably worry more about their health than those who have minor difficulties.
17. Most disabled persons are not dissatisfied with themselves.

18. There are more misfits among disabled persons than among non-disabled persons.

19. Most disabled persons do not get discouraged easily.

20. Most disabled persons resent physically normal people.

21. Disabled children should compete with physically normal children.

22. Most disabled persons can take care of themselves.

23. It would be best if disabled persons would live and work with non-disabled persons.

24. Most severely disabled people are just as ambitious as physically normal people.

25. Disabled people are just as self-confident as other people.

26. Most disabled persons want more affection and praise than other people.

27. Physically disabled persons are often less intelligent than non-disabled ones.

28. Most disabled persons are different from non-disabled people.

29. Disabled persons don't want any more sympathy than other people.

30. The way disabled people act is irritating.

ATTITUDE TOWARD DISABLED PERSONS SCALE
FORM B

READ EACH STATEMENT AND PUT AN "X" IN THE APPROPRIATE COLUMN ON THE ANSWER SHEET. DO NOT MAKE ANY MARKS ON THE QUESTION SHEETS.

PLEASE ANSWER EVERY QUESTION

1. Disabled persons are usually friendly.
2. People who are disabled should not have to pay income taxes.
3. Disabled people are no more emotional than other people.
4. Disabled persons can have a normal social life.
5. Most physically disabled persons have a chip on their shoulder.
6. Disabled students can be as successful as other students.
7. Very few disabled persons are ashamed of their disabilities.
8. Most people feel uncomfortable when they associate with disabled people.
9. Disabled people show less enthusiasm than non-disabled people.
10. Disabled people do not become upset any more easily than non-disabled people.
11. Disabled people are often less aggressive than normal people.
12. Most disabled persons get married and have children.
13. Most disabled persons do not worry any more than anyone else.
14. Employers should not be allowed to fire disabled employees.
15. Disabled people are not as happy as non-disabled ones.
16. Severely disabled people are harder to get along with than are those with minor disabilities.
17. Most disabled people expect special treatment.
18. Disabled persons should not expect to lead normal lives.
19. Most disabled people tend to get discouraged easily.

20. The worst thing that could happen to a person would be for him to be very severely injured.

21. Disabled children should not have to compete with non-disabled children.

22. Most disabled people do not feel sorry for themselves.

23. Most disabled people prefer to work with other disabled people.

24. Most severely disabled persons are not as ambitious as other people.

25. Disabled persons are not as self-confident as physically normal persons.

26. Most disabled persons don't want more affection and praise than other people.

27. It would be best if a disabled person would marry another disabled person.

28. Most disabled people do not need special attention.

29. Disabled persons want sympathy more than other people.

30. Most physically disabled persons have different personalities than normal persons.

ATTITUDE TOWARD DISABLED PERSONS SCALE
ANSWER SHEET FORM A AND B

CODE #_____

Use this answer sheet to indicate how much you agree or disagree with each of the statements about disabled people on the attached list. Put an "X" through the appropriate number from +3 to -3 depending on how you feel in each case.

+3:	I AGREE VERY MUCH	-1:	I DISAGREE A LITTLE
+2:	I AGREE PRETTY MUCH	-2:	I DISAGREE PRETTY MUCH
+1:	I AGREE A LITTLE	-3:	I DISAGREE VERY MUCH

PLEASE ANSWER EVERY ITEM

(1)	-3	-2	-1	+1	+2	+3	(16)	-3	-2	-1	+1	+2	+3
(2)	-3	-2	-1	+1	+2	+3	(17)	-3	-2	-1	+1	+2	+3
(3)	-3	-2	-1	+1	+2	+3	(18)	-3	-2	-1	+1	+2	+3
(4)	-3	-2	-1	+1	+2	+3	(19)	-3	-2	-1	+1	+2	+3
(5)	-3	-2	-1	+1	+2	+3	(20)	-3	-2	-1	+1	+2	+3
(6)	-3	-2	-1	+1	+2	+3	(21)	-3	-2	-1	+1	+2	+3
(7)	-3	-2	-1	+1	+2	+3	(22)	-3	-2	-1	+1	+2	+3
(8)	-3	-2	-1	+1	+2	+3	(23)	-3	-2	-1	+1	+2	+3
(9)	-3	-2	-1	+1	+2	+3	(24)	-3	-2	-1	+1	+2	+3
(10)	-3	-2	-1	+1	+2	+3	(25)	-3	-2	-1	+1	+2	+3
(11)	-3	-2	-1	+1	+2	+3	(26)	-3	-2	-1	+1	+2	+3
(12)	-3	-2	-1	+1	+2	+3	(27)	-3	-2	-1	+1	+2	+3
(13)	-3	-2	-1	+1	+2	+3	(28)	-3	-2	-1	+1	+2	+3
(14)	-3	-2	-1	+1	+2	+3	(29)	-3	-2	-1	+1	+2	+3
(15)	-3	-2	-1	+1	+2	+3	(30)	-3	-2	-1	+1	+2	+3

APPENDIX D

LETTER TO SUBJECTS

Date

Dear

You are well acquainted with _____ in your school who represents a multihandicapped child. With such children as a point of reference, would you please answer the enclosed list of 30 short questions which should require only 5 - 10 minutes of your time. Your cooperation is most appreciated.

Please complete the other enclosed data sheets, the answer sheet as directed, and return the completed forms in the enclosed self-addressed, stamped envelope.

Sincerely yours,

Marjorie C. Becker, R.P.T.
Pediatric Rehabilitation Service
S13035 University Hospital
University of Michigan Medical Center

MCB/pae
Enclosures (2)

APPENDIX E

DATA CODE SHEETS

STUDENT INFORMATION

CARD I

Column

1 Blank

2-4 IQ
0 NR

5-8 M.A. (years)
0 NR

9-12 Social Age (years)
0 NR

13-15 Social Quotient
0 NR

16-17 Severity of disability

0 NR
1 potential disability only if impairment is neglected
2 detectable disability causing no handicap as yet
3 disability causing handicap in one or potential handicap in more than one area of living, as yet requiring no significant adjustment of accustomed behavior
4 disability causing handicap in more than one area, not severe enough to require special adjustment except in personal habits
5 physical disability severe enough to require special environmental, educational, and/or vocational adjustments but no continuous supervision
7 physical or psychosocial disability severe enough to require supervision in specialized facilities for some activities: social, educational, vocational
9 physical and psychosocial disability are involved handicapping all areas to a marked degree as in 7
10 disability severe enough to enforce complete dependence for all care in a permanently supervised environment

18 Vertebral level of neurologic defect
0 NR
1 cervical
2 thoracic
3 lumbar
4 sacral

20 Specific vertebra involved
0 NR

21-22 Braces used
- 0 NR
- 1 none
- 2 orthopedic shoe changes only
- 3 left short leg brace
- 4 right short leg brace
- 5 bilateral short leg braces
- 6 short leg braces with rotator coil
- 7 left long leg brace
- 8 right long leg brace
- 9 bilateral long leg braces
- 10 bilateral long leg braces with pelvic band
- 11 bilateral long leg braces with back brace attached
- 12 right long leg and left short leg brace
- 13 left long leg and right short leg brace
- 14 back brace only

23 Crutches
- 0 NR
- 1 axillary
- 2 forearm
- 3 none

24 Wheelchair
- 0 NR
- 1 yes
- 2 none used

25 Ambulation status
- 0 NR
- 1 completely ambulatory
- 2 partially ambulatory
- 3 non-ambulatory

26 Repair of myelomeningocele
- 0 NR
- 1 repaired
- 2 not repaired

27 Presence of hydrocephalus
- 0 NR
- 1 hydrocephalus arrested by valve
- 2 hydrocephalus arrested without valve
- 3 no evidence of hydrocephalus

28 Bladder status
- 0 NR
- 1 continent
- 2 no diversion or evidence of damage
- 3 no diversion, catheter drainage

4 supra-pubic cystostomy drainage
5 vesicostomy diversion
6 ileal-loop diversion
7 ureterostomy diversion

29 Hip status
0 NR
1 no dislocation
2 left dislocated, not repaired
3 right dislocated, not repaired
4 bilateral dislocations, not repaired
5 left dislocated, repaired
6 right dislocated, repaired
7 bilateral dislocations, repaired
8 bilateral dislocations, one side repaired

30 Foot status
0 NR
1 no problems
2 mild deformity, no surgical treatment
3 handicapping deformity, no treatment
4 deformity, treated by surgical soft tissue release or tendon lengthening

31 Eye status
0 NR
1 no squint present
2 squint present but not treated
3 squint present, treated by patching
4 squint present, treated with glasses
5 squint present, treated with patching and glasses
6 squint present, treated surgically

32 Other surgical procedures
0 NR
1 none
2 vertebral resections
3 femoral osteotomies
4 release of contractures
5 tendon transfers
6 osteotomies and release of contractures
7 osteotomies and tendon transfers
8 release of contractures and tendon transfer
9 three or more musculoskeletal procedures

33 Associated problems
0 NR
1 none
2 multiple surgeries for hydrocephalus or meningocele
3 multiple contractures (including foot deformities)
4 scoliosis

5 skin breakdown
6 mild cerebral palsy
7 obesity
8 two or more associated problems

34 Siblings
0 NR
9 none

35 Residence
0 NR
1 urban
2 rural

36 Socio-economic status
0 NR
1 upper class
2 upper middle class
3 lower middle class
4 upper lower class
5 lower lower class

37-38 Grade in school
0 NR
15 pre-school program
16 kindergarten
17 ungraded

39 School placement
0 NR
1 full time, regular class, regular school
2 partially integrated, regular school
3 full time, orthopedic room, regular school
4 full time, orthopedic school
5 day care center for ortho - MR
6 special pre-school program for orthopedic
7 homebound
8 MR room regular school

40-41 School history
0 NR
1 always regular school
2 always orthopedic room, regular school
3 always partially integrated
4 moved from orthopedic to regular room
5 moved from orthopedic school to regular school
6 always orthopedic school
7 moved from special pre-school to orthopedic room, regular school
8 moved from special pre-school to orthopedic school
9 always day care center program

10 always homebound
11 homebound to school setting
12 always MR room regular school
13 moved from orthopedic school to day care center
14 moved from orthopedic room to homebound

42 School starting
0 NR
1 in pre-school program
2 at kindergarten level at age 5
3 at first grade level, age 6
4 admitted age 7
5 admitted age 8
6 admitted age 9
7 admitted age 10

43 Sex
0 NR
1 male
2 female

44-45 County of residence
0 NR
1 Wayne
2 Oakland
3 Macomb
4 Genessee
5 Kalamazoo
6 Berrien
7 Washtenaw
8 Monroe
9 Lenawee
10 Jackson
11 Muskegon
12 St. Clair
13 Shiawassee
14 Midland
15 Tuscola
16 Clinton
17 Barry
18 Calhoun
19 Cheboygan
20 Keweenaw
21 Isabella

46-49 Chronological age in years

52-53 Socio-economic status in grades
00 NR

65 Group
- 0 NR
- 1 control
- 2 experimental
- 3 unmatched

66 Person identification
- 0 NR
- 1 student
- 2 teacher
- 3 principal
- 4 special education director
- 5 physical therapist
- 6 occupational therapist

67-68 Student number
- 0 NR
- 01 through 60

69-71 Teacher number
- 0 NR
- 001 is teacher #1 for child
- 002 is teacher #2 for child
- 99 no teacher

72-73 Principal number
- 0 NR
- 01 through 60
- 99 no principal

74-75 Special education director number
- 0 NR
- 01 through 60
- 99 no special education director

76-77 Physical therapist
- 0 NR
- 01 through 60
- 99 no physical therapist

78-79 Occupational therapist number
- 0 NR
- 01 through 60
- 99 no occupational therapist

80 Card number
- 0 NR
- 1 student card
- 2 educator card
- 3 additional school information

EDUCATOR INFORMATION

CARD II

Column

1 Blank

2-4 ATDP - B Score
0 NR

5-7 ATDP - A Score
0 NR

8 Marital status
0 NR
1 married
2 single
3 divorced
4 widowed

9 Age
0 NR
1 20-30 years
2 31-40 years
3 41-50 years
4 over 51 years

10 Sex
0 NR
1 male
2 female

13 Certification
0 NR
1 elementary teacher cert.
2 secondary teacher cert.
3 physical therapy cert.
4 occupational therapy cert.
5 school administrator
6 elementary and secondary
9 none

14-15 Special education approval
0 NR
1 none
2 full MR
3 full emotionally disturbed
4 full speech
5 full visual

6 full hearing
7 full crippled
8 full hospital homebound
9 full special education administrator
10 full psychologist
11 full school psychologist and administrator
12 full visually and crippled
13 full crippled, hosp. and homebound
14 full crippled, temp. MR
15 full crippled, temp. visual
16 full crippled, full hosp., temp. MR
17 full speech, full vision, full hearing, full crippled
18 full MR; temp. emotionally disturbed, full special education administrator
19 full speech, full special ed. admin.
20 temp. emotionally disturbed, full special ed., full dx
21 full crippled, full MR, full spec. ed.
22 temporary MR
23 full MR, full special education admin.
24 full speech, temp. MR, full spec. ed.
25 full MR, full crippled, full hospital homebound, full special ed. admin.
26 full approval all categories
27 full MR, full emotionally disturbed, full crippled, full special ed., full dx
28 full MR, full emotional disturbed, full speech, full hearing, full vision, full special education

33 temporary emotionally disturbed
44 temporary speech
55 temporary visual
66 temporary hearing
77 temporary crippled
88 temporary hospital homebound
98 does not apply

16-17 Years of teaching experience in special education
0 NR
98 does not apply
99 none

18-19 Years of experience in regular class or other professional jobs
0 NR
98 does not apply
99 none

20-21 Years of experience in regular school administration
0 NR
98 does not apply
99 none

22-23 Years of experience in special education administration
- 0 NR
- 98 does not apply
- 99 none

24 Job satisfaction
- 0 NR
- 1 very satisfied
- 2 moderately satisfied
- 3 neither satisfied nor dissatisfied
- 4 moderately dissatisfied
- 5 very dissatisfied

25 Presence of disability in educator
- 0 NR
- 1 none
- 2 war injury
- 3 dermoid cyst, left eye
- 4 burn scar
- 5 present but not described

26-27 Presence of disability in family
- 0 NR
- 1 none
- 2 husband, hemiplegia
- 3 daughter, congenital defects
- 4 father, laryngectomy
- 5 brother, acquired paralysis
- 6 brother, polio
- 7 nephew, cerebral palsy
- 8 elastosis
- 9 son, convulsive disorder
- 10 cousin with spina bifida
- 11 hearing loss
- 12 brother, partial vision loss
- 13 unspecified

28 Previous children in classroom with myelodysplasia
- 0 NR
- 8 does not apply
- 9 none

29 Type of classroom teacher or therapist; type of school for principal
- 0 NR
- 1 regular
- 2 orthopedic room
- 3 orthopedic school
- 4 day care
- 5 pre-school
- 6 homebound

7 itinerant
8 does not apply
9 MR room

30-31 Years of experience as school therapist
0 NR
98 does not apply
99 none

32-33 Years other professional work experience
0 NR
98 does not apply
99 none

48 Level of education
0 NR
1 Bachelor's degree
3 Master's degree
4 Ed.D. or Ed.S.
5 Ph.D.

65 Group
0 NR
1 control
2 experimental
3 unmatched

66 Person identification
0 NR
1 student
2 teacher
3 principal
4 special education director
5 physical therapist
6 occupational therapist
7 teacher-counselor

67-69 Educator number
0 NR
01 60
011 teacher #1 for child
012 teacher #2 for child

80 Card number
0 NR
1 student card
2 educator card
3 additional information

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