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MONTGOMERY, JOHN DENTON

MOTHER/TEACHER LOCUS OF CONTROL: IMPACT ON PRESCHOOL  
HANDICAPPED CHILD CHANGE

*Iowa State University*

PH.D.

1980

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Mother/teacher locus of control: Impact on  
preschool handicapped child change

by

John Denton Montgomery

A Dissertation Submitted to the  
Graduate Faculty in Partial Fulfillment of the  
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DOCTOR OF PHILOSOPHY

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Signature was redacted for privacy.

In Charge of Major Work

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Ames, Iowa

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## INTRODUCTION

## Focus

Bloom (1964) examined the growth records of 1000 children from infancy through age 18. These data were interpreted to mean that children apparently form more of their intelligence between birth and 8 than between 8 and 17. Bloom concluded that the home environment during the early years is vitally important to later development. During the past decade the importance of child development during the preschool years has gained national attention and support. In an attempt to insure maximum developmental growth during these preschool years, educators across the nation have developed programs to give better preparation to preschool children for entry into elementary school.

In addition to popular preschool programs such as private preschools, Headstart and Day Care Centers, an additional awareness of the need for developing the learning potential of preschool handicapped children has emerged in the literature. Parents gained new hope as programs were developed in the 1970's to extend special education services to preschool handicapped children.

The United States government, realizing the learning potential in and developmental needs of handicapped children, has legislated equality of educational opportunity to all children. The mandate was contained in the Education of Handicapped Act, Public Law, 94-142, 1975. This mandate forced child development specialists to evaluate how they could best serve these preschool handicapped children. Two delivery systems seemed to

emerge: (a) the center-based intervention model and (b) the home-based intervention model.

Both intervention models progressively utilized the parent as learner, observer, aide and teacher as a major thrust of the intervention program. Thus parent training curricula were developed to transmit child development knowledge and explore intervention techniques parents could use with their preschool handicapped children. Neither intervention model stressed or assessed the importance of mother or teacher attitude as a variable in affecting child change.

This investigation is concerned with the possible effects mother/teacher attitudes have on child change. Specifically, is there any relationship between the degree to which the mother or the teacher perceives that she is able to influence the outcomes of situations (Locus of Control) and preschool handicapped child change.

### Background and Scope of the Study

Preschool handicapped intervention is designed to stimulate the learning potential of children by organizing environmental variables to enhance child change. To help the reader better understand the background and scope of this study, it is necessary to examine the historical development of early stimulation studies prior to the intervention mandate.

#### Historical background

Preschool handicapped intervention, as a strategy, had its origin in an emergent body of theory and research in the 1940's and 1950's pointing to the beneficial effects of early stimulation both in animals and humans

(Bronfenbrenner, 1974). In this context, early stimulation is a term denoting concern with the overall supply and variety of stimulation impinging on an infant and is defined in terms of deprivation and enrichment (Stone, Smith & Murphy, 1973).

In the early human studies, Spitz (1973) focused on maternal lacks in institutionalization which he coupled with studies of separation. Institutionalization with maternal absence, even when an infant's care was limited to a small fraction of maternal time (spread over several substitutes), produced significant developmental deficits. More specifically, Pringle and Bossio (1958) found earlier entering institutionalized children performed more poorly on the verbal section of the intelligence test and on other tests of language development. Thus, it would appear that extended periods of maternal deprivation and the resulting lack of stimulation tend to contribute to a deficit in language development.

Animal studies such as Beach and Jaynes (1954), Clarke, Heron Fetherstonhaugh, Forgays, and Hebb (1951), and Harlow (1958) demonstrated that one of the causes of poorer intellectual and emotional development in environmentally restricted animal infants is lack of stimulation. Clarke et al. (1951) showed that dogs reared in a restricted environment are not only less intelligent but are also socially deviant compared to dogs raised in a varied environment. Researchers who varied the visual and tactile stimulation in environments produced rats that when mature were more intelligent and less emotional than other white rats that had been restricted in infancy (Beach & Jaynes, 1954). Subsequent deprivation studies in animal infants were greatly influenced by Harlow's (1958) study

of love in the rhesus monkey. Harlow concluded that the long-range effects of partial and total social deprivation resulted in significant changes in social, maternal, affectional, sexual and learning behavior of the rhesus monkey. These preceding studies provided a basis for the premise that both human and animal development can be facilitated by additional stimulation in the environment.

Jean Piaget, whose theories of child development became more widely known during the late 1950's and 1960's, had much influence on western psychological thought regarding child stimulation. Popularly interpreted, Piagetian theory emphasized stages of cognitive development in the young child with the progression through each stage equally dependent on the child's interacting with the environment.

Cognitive development also was the focal point of the Harvard Center for Cognitive Studies, established in 1960 by Jerome S. Bruner. Bruner was convinced that the environment, i.e., culture, shaped the child; that growth in learning depended upon what tools and stimuli a young mind found in the surroundings.

Many of the research implications for education were consolidated by J. McVicker Hunt (1961). Hunt believed that, through proper preschool enrichment procedures, future generations of mankind could be made more intelligent. Additional support for Hunt's position came from Benjamin F. Bloom's (1964) contention that about half of intellectual development takes place between conception and age four.

Another early advocate of accelerated learning, William Fowler (1962), emphasized that bright people are not necessarily gifted but that

they appear to be stimulated early in life to explore and focus their talents.

More recently, the significance of the first two years of life has appeared in the literature. Meier (1973) reported a relationship between the developmental status of two-year-old children and the quality of their early family history--aside from poor birth histories. He suggested that early family environment has significant impact on development before the second birthday, that learning patterns are set by two years of age and cognitive patterns by age four. Such factors as parental language styles, attitudes toward achievement and involvement and concern with the young child have been identified as important factors in establishing these patterns. In Meier's study, attitude is recognized as a factor in child achievement, thus affecting learning patterns in children before their second birthday.

In addition to these cognitive concerns, White (1975) postulated that primary social orientation is established by age two and that this social orientation is thereafter increasingly difficult to alter significantly. White's study adds the importance of social orientation to cognitive development.

These early investigations identify the preschool years as critical periods in a child's developmental process. The learning potential of young children is dependent upon environmental stimulation which fosters skill development in cognitive and social areas. This surge of interest in early child development in the 1960's signaled the creation of Head-start programs designed to reduce early educational failures. These

Headstart programs encouraged participating parents to take children outside the home to educational centers where appropriate experiences could be provided several days during the week. Children participating in center-based programs were offered structured preschool activities which stimulated cognitive functioning and social skill development which was fostered by peer interaction. Thus the Federal Government, through Headstart, committed large sums of money, facilities, and staff personnel to provide stimulation programs for preschool children prior to their entry into elementary school.

Concurrently, other early childhood programs started in the 1960's were showing positive results.

The first well-designed experimental programs of preschool intervention were instituted by Samuel A. Kirk, Susan W. Gray and D. P. Weikart and produced dramatic initial gains of up to 15 or more IQ points in the space of a few months. (Bronfenbrenner, 1974, p. 15)

As a result of these apparently successful experimental programs, other research projects were initiated in an attempt to substantiate these findings.

Klaus and Gray (1968) found, unexpectedly, that home visiting teacher contact with mothers in their Early Training Project paid a generalizable dividend. Special summer school experiences were provided for an experimental group of disadvantaged youngsters, while weekly home contacts were planned during the nine intervening months to carry forward the objectives of the summer school. Younger siblings of control group members were compared with siblings of members of the experimental group. Siblings of the experimental group showed a 13 point IQ superiority over the

control group's siblings. This was one of the earlier projects to begin systematically exploring the impact intervention contact with mothers had upon performance of their children.

Since the late 1960s probably every compensatory model of intervention has viewed the child as a part of an ecological system whose elements are in continuous interaction. Specifically, attention has been focused on the interaction between the objective environment, the world of things the child manipulates, and the instrumental environment, or the world of people. The instrumental environment consists of those significant others within the family constellation (generally mother), who mediate between the child and the objective environment (Gilmer, Miller & Gray, 1970). Thus, the stimulation provided by the family, environment and overall culture is found to relate to child development.

In addition to the Headstart programs, other private preschools and day care centers began appearing on the scene. However, few programs were geared to developing the learning potential of preschool handicapped children. Many high-risk handicapped children were without the benefit of preschool stimulation programs geared to foster their learning potential. This presented a paradox; i.e., the children from the homes that more likely had environments most similar to the institutional environment reported by Pringle and Bossio (1958) and Spitz (1973) were least affected by the programs emphasizing early stimulation.

To address this problem, Congress enacted the Handicapped Children's Early Education program, Public Law 91-230 in 1968. Part C of the Law authorized the development of experimental preschool projects for handi-

capped children. Major premises of this legislation include: 1) preschool handicapped children can learn within the home environment and 2) parent behavior, which affects learning, can be positively modified by training.

From this beginning, two major intervention models have emerged to serve handicapped children. The two models are being increasingly modified to present four basic service delivery systems: center-based, home-center-based, home-based, and parent administered center-based (Lillie & Trohanis, 1976).

An increasing number of persons have become interested in the education of preschool handicapped children as well as those children considered to be "at risk" for normal development. Succeeding grants of governmental and private monies have increased research and service programs for preschool handicapped children. Many of these programs utilize the parents, more specifically the mother, as the intervention target. The parent, as the child's first teacher, is the provider of most early home stimulation for handicapped as well as other preschool children.

Mothers of handicapped children often did not seek employment outside the home and therefore were available to participate in the intervention program.

Many such programs from the late 60s and 70s have been federally validated by the Joint Dissemination Review Panel, United States Office of Education. These validated programs reported significant growth in cognitive, motor and social skills for participating handicapped children.

In review, preschool intervention as a strategy had its origin in the early animal and human infant stimulation studies. The writings of Jean Piaget exerted much influence on western psychological thought as phases of cognitive development have been explored. Early stimulation programs in the 1960s produced dramatic IQ gains for preschool disadvantaged children. Widespread adoption of stimulation programs followed. In the 1970s early childhood programs for handicapped children focused on the parents as the major providers for child stimulation.

### Intervention mandate

As an outgrowth of research evidence accumulated from the early childhood programs for the handicapped, federal legislators enacted Public Law 94-142. This law mandated early educational intervention for preschool handicapped children by requiring that all states offer full educational services to all handicapped children starting at age three except where state laws specifically set the entry age above that level.

The National Advisory Committee on the Handicapped (1976) further delineated the specific services of Public Law 94-142:

Toward achieving the goal of providing early childhood education for all handicapped children, the committee recommended that such education be mandated by the states and that local education agencies assume primary responsibility for its conduct; that all state plans for special education include a section dealing with preschool children, that whenever possible handicapped children be integrated into regular early childhood programs, that increased emphasis concomitantly be placed on preservice training of early childhood education; and that research in early childhood education be increased. (p. 43)

The major divisions of the mandate which were specifically targeted toward the inclusion of preschool activities in the broader spectrum of special education services included:

- 1) a state plan for education of preschool handicapped children;
- 2) integration into regular early childhood programs;
- 3) preservice training of early childhood educators;
- 4) research in early childhood education.

The state plan for education of preschool handicapped children in Iowa was prepared by the Special Education Division, Department of Public Instruction. Each Area Education Agency within Iowa submitted its own plan for education of preschool handicapped children. These area plans had to complement the state plan. Integration of handicapped children into regular early childhood programs was left primarily to the discretion of local educational agencies. The major universities of Iowa modified preservice training to include child development, special education and other relevant courses in order to meet new certification guidelines established by the Department of Public Instruction. Research was stimulated as new service delivery systems, instructional approaches and accountability methods for preschool handicapped children and their families were designed and implemented.

In review, the intervention mandate, Public Law 94-142, guaranteed educational opportunity for preschool handicapped children, beginning at age three (unless a state had legislated a higher entry age), by mandating national, state and local guidelines and providing the corresponding funding for implementation.

#### Intervention model

Major elements in the preschool intervention model consist of the following: theory of child development, philosophy of teaching,

curriculum, and a delivery system. Different interpretations of these components have led to some variations in the intervention model.

Most preschool educators subscribe to a "stage theory" of development; i.e., emphasis is placed on intraindividual variability over time and in similarities among individuals at specifiable age periods (Bandura & Walters, 1967). As development takes place in ordered stages during early childhood, each stage builds upon what has been learned already and is equally dependent on the child's interacting with the environment (Chow, Elmore, & Ertle, 1973). Child change in the intervention model generally refers to an attempt at accelerating lagging developmental skills during the critical stages of child growth.

One of the fundamental philosophical differences among early childhood educators lies in their allegiance to certain theoretical persuasions which can be placed on a continuum ranging from the cognitive to the behavioral approaches. The cognitive developmentalists and the behaviorists differ mainly in how a child is perceived as a learner on an active-passive dimension and in how cognitive hierarchies occur. The cognitive developmentalists, basing their beliefs on the works of Piaget, believe the child constructs his own hierarchies while Gagne (1965), a behaviorally oriented learning theorist, views cognitive hierarchies to be developed through instruction. Thus, one camp makes inferences about the internal life of a child and believes guided discovery leads to insight and understanding. Behaviorists who draw on the works of B. F. Skinner argue that it is not productive to talk about internal mechanisms or processes which cannot be observed or measured. Education, as viewed by

the behaviorists, is seen as an external process to provide change in observable behavior such as knowledge gains in children.

Anastasiow and Mansergh (1975) found that, although early childhood educators differ in the techniques they select for teaching children, there was high agreement on the instructional content and materials used. Program curricula appear, then, to differ more in method of presentation than in content.

Three preschool delivery systems have been most popular for meeting the preschool handicapped child's needs: (a) center based delivery system that requires child attendance, (b) home based delivery system that utilizes intervention teachers making home visitations for the purpose of parent instruction, and (c) home-center based delivery system that utilizes intervention teachers for the same purpose as the home based delivery system and also use a center for accelerating social development of the children.

The question of preschool delivery system has frequently been accompanied by "who shall teach?" Traditionally, only "professional" teachers were allowed to teach children. Parents could be enlisted as aides, taught certain teaching techniques, and at times were given teaching responsibilities with minimum supervision. Even though parents have been involved in teaching and quasi-teaching tasks, there are many who hold the idea that all or most teaching should be left to "professional teachers."

However, Gordon and Lally (1969), Gray and Klaus (1970), Karnes, Hodgins, and Teska (1969), and Weikart and Lambie (1969) utilized parents as teachers in pioneer programs noted for successful child change. It is

not surprising that these educators, among others, have argued that educational efforts in day-care centers, nurseries, Headstart centers, and public schools should teach parents how to teach and involve them in the teaching of their offspring. Schaefer (1972) reviewed research on the effects of training and utilizing parents as teachers and concluded that such programs could provide an effective supplement for, or even an alternative to, preschool education. Bronfenbrenner (1974) favored complete family involvement in the continuing development of the child:

The evidence indicates that the family is the most effective and economical system for fostering and sustaining the development of the child. The evidence indicates further that the involvement of the child's family as an active participant is critical to the success of any intervention program. Without such family involvement, any effects of intervention, at least in the cognitive sphere, appear to erode fairly rapidly once the program ends. (p. 17).

Thus, the degree of family involvement and participation in the intervention program appears to be directly related to the amount of child change.

In summary, the Intervention Model most widely used today is eclectic in nature and is based on the stage development theory of growth, utilizes various behavioral and cognitive instructional techniques, has a rather common curriculum, involves both home and center delivery systems, and relies on parents as change agents for their own children.

#### The Marshalltown Project

Programs for preschool handicapped children were developed in central Iowa three years before the July, 1975, state mandate for such educational services. The Marshall-Poweshiek Joint County Board of Education in 1972 submitted a proposal to commence a program for home education of preschool handicapped children aged 0-6 years. This proposal was funded that year

by a grant from Title VI, Education of the Handicapped, Part C, Public Law 91-230. In 1973 the Joint County Board of Education wrote another proposal to facilitate parent based educational services for children lagging in developmental skills. This proposal was funded by a Title III, E.S.E.A. grant. The monies from both grants were then consolidated and administered through what is commonly called "The Marshalltown Project." The administrative unit for the Marshalltown Project changed from Marshall-Poweshiek Joint County Board to Area Education Agency 6 in 1975.

During the 1971-72 school year the Marshalltown Project intervention model was formulated. Leaders in the early childhood movement (Anastasiow, Ashcroft, Clark, Crowley, Goldstein, Hayden, Karnes, Lillie, Northcott, Painter, Shearer, Scott, Weigerink, Weikart, and Zehrback) served as consultants to the Marshalltown Project staff via inservice and/or critique of project materials. The predominantly rural population, background of project staff, and relative success of different models were determining factors in the final intervention model selected for the Marshalltown Project. Essentially, the designers of the model subscribed to the "stage" theory of development, utilized behavioral instructional techniques, synthesized a developmental profile for use in assessment and selected the home as a target and vehicle for service delivery.

The Marshalltown Project was designed to provide in-home educational services for preschool handicapped children from birth through age five. The main thrust was directed towards training of parents of handicapped children to help them become more effective "first teachers." The target children and their parents were identified by administering The Marshall-

town Behavioral Developmental Profile to children who were referred by external agencies. The MBDP was locally developed and designed to provide a systematic assessment of a child's communication, motor, and social skills and to aid the home teacher and parent in monitoring child progress in each of these skill areas. Three corresponding manuals were developed to facilitate individualized prescriptive teaching for each of the skill areas.

At this point, five home intervention strategists and a psychologist were employed to identify the target children and prepare individualized learning programs for parent use with the target child. These activities involved 30 children and their parents during the initial year.

The need for intervention services was of such magnitude that four additional home intervention strategists were employed for the 1973-1974 school year. The project was thus able to provide services for 90 handicapped preschool children. During the next three years the project served an average of 100 preschool children per year.

Word of the Marshalltown Project spread and persons employed for other such projects came to Marshalltown for four and a half days of intensive training. The project grew in reputation through the training of intervention strategists and the dissemination of curricular and assessment materials even though research data concerning the effectiveness of the program had not been systematically summarized and reported.

As other preschool projects began adopting materials and techniques from the Marshalltown Project, it became apparent to consultants from Title III E.S.E.A. at the Iowa Department of Public Instruction that

process and product effectiveness needed to be addressed. Consequently, the Marshalltown Project director was encouraged to apply for formal program review by a team of out-of-state evaluators selected from the Title III evaluator network.

The Marshalltown Project was reviewed in May, 1975, by an area Title III validation team. Project components which were assessed for their "adoptability" characteristics included 1) information and project description, 2) evidence of effectiveness (child change), 3) management and operation costs, and 4) evidence of project exportability.

Available project information was considered satisfactory, so emphasis was directed towards the latter three components. The Marshalltown Project staff was faced with the problem of demonstrating that apparent gains made by children were in fact attributable to treatment effects and not to normal child maturation. The problem was exaggerated by the fact that there was no control group against which to compare the treatment children. An earlier attempt had been made to obtain a control group, but differences in degree and nature of handicapping conditions, and logistical and personnel restrictions led to the decision that the identification of a control population was not a realistic option. Since another approach was required, it was decided to regress the three basic measures of communication, motor, and social skills against child age. Pre-treatment measures were obtained for communication, motor and social developmental skills of each child and regression equations against age were established. The  $r^2$  measured were .72, .69 and .51 respectively and so regression (prediction) lines appeared to fit the data well. At the

end of the first year's treatment, the three skill areas were once again measured. The predicted score (utilizing the regression equation and the child's current age) was compared to the child's observed scores. A large percentage of the children exhibited gains significantly larger than was predicted for them if they had not had the treatment. Relatively few children performed below the expected level. Eight out of 46 children showed significant gains in communication skills; 38 of 46 showed significant gains in motor skills; and 38 of 46 showed significant gains in social skills ( $p < .05$ ). Group mean gains were 6 months in communication, 16 months in motor and 19 months in social skills ( $p < .001$ ).

The cost of beginning home intervention plus the on-going operational and management costs were computed using a unit of 16 students per one home teacher. Start-up costs amounted to \$47.62 per learner, and the operational and management costs, utilizing paraprofessional teachers, were \$461.38. The total cost of \$509 per student for 11 months compared favorably with the average within school learner cost of \$1000 per school year.

Overall evidence for and feasibility of exportability were assessed on the basis of (a) the number of services within the Marshalltown Project format considered sufficiently structured, tested and successful to be useful to other preschool programs; e.g., staff training, child identification, parent training, and child change, (b) the frequency and number of on-site and off-site training sessions conducted for other project staff members, (c) the amount of curricular and assessment materials that had

been requested and disseminated, and (d) the amount of materials on hand and ready for dissemination.

The results reported by the review team, after three days of on-site assessment, indicated that the Marshalltown Project passed "state validation review" as an exemplary program for preschool handicapped children. The Excellence in Education Award from the National Association of State Advisory Council Chairmen was presented to the Marshalltown Project in December 1975.

Child change was summarized in the final Title III Project Report, May, 1976. Essentially one goal and two objectives set the tenor for service provision and evaluation of child change.

Goal: To provide educationally deprived children with home experiences that will facilitate maximum chronological/maturational/developmental skills commensurate with their mental age. (p. 13)

Objective: After completion of each year of the project, all children involved will have completed successfully eighty percent of the skills prescribed by the home specialists. (p. 13)

Objective: After completion of each year of the project, eighty percent of the children involved in the project will demonstrate an average of eight months' gain in communication, motor and social skills. A comparison of results will be made between a nonstandardized instrument (The Marshalltown Behavioral Developmental Profile) and a standardized instrument (The Alpern-Boll Developmental Profile). (pp. 15-17)

Children in the project successfully completed 83 percent of the skills prescribed by home teachers for a three-year evaluation period. Pre-posttest gains, as measured on the Marshalltown Behavioral Developmental Profile, indicated that 63% of the project children (37% of the total number enrolled did not have complete data) showed an average of 15 months' change in communication skills, an average of 15 months' change in

motor skills, and an average of 11 months' change in social skills for each year of service.

Pre-posttest gains made using the Alpern-Boll Developmental Profile indicated that 56% of the project children showed 13 months' change in communication, 15 months' change in motor, and 17 months' change in social skills for each year of service.

The above results indicated that fewer children than anticipated demonstrated greater than expected gains in communication, motor and social skills.

In summary, the Marshalltown Project, as a home intervention program, has been able to provide evidence of effectiveness in improving learner performance within a preschool handicapped target population.

### Problem

The effects of environmental stimulation in early education have been well documented. Milner (1951) investigated certain parent-child interaction patterns that related to reading readiness of first grade children. The results indicated that high scorers had a much richer verbal environment than low scorers; there were more books in the home; and the children were read to more often and were expected to speak with parents at meals and at other times.

Goodman (1952) explored the awareness of race differences and feelings about such differences among young children. She found that attitude-generation at an early age is amenable to change while the

personality is still malleable, whereas such change becomes less probable as the child grows older.

Kirk (1958) reported an investigation of the influence of nursery school-like experience on the intelligence of feeble-minded children between 3 and 6 years old. The main finding was that the over-all effect of the nursery experience on retarded children was positive. Thirty of 43 retarded children (70 percent) showed an acceleration in rates of intellectual growth ranging from 10 to 30 IQ points. The children retained the accelerating rates of growth established during the nursery school experience during a follow-up period from 3 to 5 years.

Brazziel and Terrell (1962) conducted a six-week readiness program for Negro first grade children. The program included parent meetings, educational TV watched in the home, and a readiness program to develop vocabulary, perception, word reasoning and ability to follow directions. At the end of the project the experimental class was at the 50th percentile on readiness as measured by the Metropolitan Readiness Test, while the three nonexperimental classes, in the same period, were at the 15th percentile.

Ausubel (1963) examined the problem of reversability of the effects of cultural deprivation on verbal and abstract intelligence. It was his contention that language retardation in the culturally deprived caused children to experience most difficulty in transition from concrete to abstract mode of thought, a transition which is necessary for the junior high school years. Recommendations stressed preschool enrichment emphasizing perceptual discrimination and language development.

Gray and Klaus (1963) conducted an early training project for Negro culturally deprived children. The program aimed at improving attitudes toward achievement, aptitudes, and abilities (language, perception, concept formation) considered necessary for successful school learning. Results of pre- and posttesting over a 15-month period showed significantly greater improvement on Binet and Peabody Picture Vocabulary Tests for experimental groups than for control groups.

Deutsch (1964), in reviewing his data, indicated that preschool, kindergarten or day-care experience, or a combination of these, was associated with higher group intelligence test scores, that scores were higher in the first grade, and the differential tended to be accentuated in a fifth grade population. This differential held even when the effects of social class were controlled.

Bloom (1964) examined and interpreted data from approximately 1000 longitudinal studies on the shaping of human characteristics from infancy to adulthood. In general, the findings revealed the tremendous importance of the first few years of life for all that follows. Change in many characteristics becomes more and more difficult with increasing age, and only the most powerful environmental conditions are likely to produce significant changes in later stages of life.

Karnes (1973) demonstrated that low-income parents can be taught teaching competencies which will result in acceleration of their children's learning abilities. At the Institute for Research in Exceptional Children, University of Illinois, the "Ameliorative Program" stressed content and materials, classroom activities, and parent involvement in

preparing preschool disadvantaged children "for effective participation in a standard school program." Evaluation studies using control groups showed gains in IQ, language development, vocabulary, comprehension, and visual perception.

Gordon (1973) trained paraprofessionals to visit homes and teach parents to provide stimulation for their 3- to 24-month-old-children. Results from these studies showed that children exposed to the parent stimulation obtained superior scores on infant mental developmental scales as compared to children not included in the study, and that mothers involved in the project showed more self-confidence in their abilities than they did before they entered the project.

Nimnicht (1973) utilized biweekly demonstration and lecture meetings plus a toy lending library to encourage greater parent involvement in his "responsive environment" for preschool through third grade children. Evaluation studies conducted by the developers, independent agencies, and schools implementing the model tended to show significant differences on measures of intelligence, achievement and self-concept.

Montgomery and Walden (1976) were able to demonstrate significant changes in preschool handicapped children within the framework of the Marshalltown Project (described in a previous section).

Generally, the research supports the position that amount, quality, and variety of environmental stimulation facilitates early child development. Priority areas most often stressed for programming are curricular content, teaching techniques and the involvement of parents in some fashion as part of the educational team.

These previously reported findings are impressive, yet this writer is left wondering if other variables might possibly contribute to even greater potential for child growth. One such variable is the attitude of those involved in the intervention process. Of particular interest to this writer is the attitude the intervention person(s) have regarding their destiny.

Rotter (1966) suggested that, depending on the individual's history of reinforcement, individuals will differ in the degree to which they attribute reinforcement to their own actions. Rotter explains:

When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action, then in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him . . . we have labeled this a belief in external control. If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in internal control. (Rotter, 1966, p. 1)

Elaboration of this premise firmed up the conceptualization of Internal-External Locus of Control. This construct states that some persons believe they have little control over their destinies and are controlled by outside sources (externals) while others believe they contribute to their own life conditions (internals).

Joe (1971) in his review of the Internal-External Locus of Control construct as a personality variable concluded:

that internals, in contrast to externals, would show a greater tendency to see information and adapt behavior patterns which facilitate personal control over their environment. (p. 627)

This conclusion supported Rotter's earlier definition of the differences between exhibited behavior and perception of control.

Much investigative work has been concerned with assessing the effects of teaching techniques rather than changing teacher or parental attitudes. Tulkin and Kagan (1973) related that techniques of teaching seldom encompass attitude change even though one source of variance in parental behavior is considered to be the parent's perception of the child. Whenever parents feel they do not have much influence on the development of their children, programs that offer "techniques of teaching" are less apt to affect child achievement. Rarely is attitude, and therefore expectation, explored as a critical variable in the parent/child or the teacher/child learning dyad. Parental perception about the degree of control they have over effecting change and their expectation of success as a function of perceived control are variables long overdue as subject matter for research.

Gordon (1973) suggested that preschool programs take time to examine parent attitude:

Part of our task is to help the mother understand how important her evaluation of the child is on his self-concept, how important her expectations for him are on his development, how important it is to provide a variety of opportunities and challenges rather than a rote learning approach. (p. 958)

Since a mother's attitude toward her child may affect his/her development, including the formation of self-concept, researchers cannot afford to neglect this potential variable in child achievement.

The Locus of Control construct was introduced into psychological literature in the early 1960's. Research interests pertaining to the

perception of control have grown. Investigations of the Locus of Control construct have been found to be related to different social behavior, learning performance, and achievement related activities. The latter is of particular interest to this study. It is felt that those mothers and teachers who hold the internal locus of control attitude will have greater involvement in teaching children new skills. Consequently, it is hypothesized that more child change will occur when the intervention person holds the internal locus of control attitude than when the intervention person holds the external locus of control attitude.

This investigation is an attempt to ascertain the relationship and/or effect (a) a mother's attitude (locus of control) has on preschool handicapped child achievement, (b) the teacher's attitude (locus of control) has on preschool handicapped child achievement, and (c) the combination of mother's and teacher's attitudes (locus of control) have on preschool child achievement. Thus, the study will focus on mother's and teacher's attitudes regarding the control they think they have over their own lives; i.e., the degree to which they perceive that they are able to influence the outcomes of situations (locus of control), and the possible impact this has on preschool handicapped child change.

#### Null Hypotheses

To examine the problem, as presented, the hypotheses were grouped according to the treatment of data with the treatment indicated. Each of the hypotheses was stated as a null hypothesis in order to facilitate statistical analyses of these data.

Treatment I

The Pearson product-moment correlation coefficient was utilized to investigate the relationship between the mother/teacher Locus of Control (LOC) variable and developmental/intellectual child change. The latter (amount of child change) was assessed using the Marshalltown Behavioral Developmental Profile (MBDP), the Alpern-Boll Developmental Profile (A-B), and a standardized intelligence test. This correlation study was also utilized to assess the relationship between child change and demographic variables independent of the mother/teacher LOC category.

- Ho<sub>1</sub>: There is no significant relationship between mother locus of control and developmental change as measured using:
- a. The Marshalltown Behavioral Developmental Profile
  - b. The Alpern-Boll Developmental Profile
- Ho<sub>2</sub>: There is no significant relationship between teacher locus of control and developmental change as measured using:
- a. The Marshalltown Behavioral Developmental Profile
  - b. The Alpern-Boll Developmental Profile
- Ho<sub>3</sub>: There is no significant relationship between mother locus of control and intellectual change as assessed using a standardized intelligence test.
- Ho<sub>4</sub>: There is no significant relationship between teacher locus of control and intellectual change as assessed using a standardized intelligence test.
- Ho<sub>5</sub>: There is no significant relationship between sex and developmental change as measured using:
- a. The Marshalltown Behavioral Developmental Profile
  - b. The Alpern-Boll Developmental Profile
- Ho<sub>6</sub>: There is no significant relationship between intelligence (at posttest) and developmental change as measured using:
- a. The Marshalltown Behavioral Developmental Profile
  - b. The Alpern-Boll Developmental Profile
- Ho<sub>7</sub>: There is no significant relationship between age (at posttest) and developmental change as measured by:
- a. The Marshalltown Behavioral Developmental Profile
  - b. The Alpern-Boll Developmental Profile

### Treatment II

Student's t test was employed to examine whether the within group mean attitudes of teachers about locus of control (internal scores 0-10, external scores 11-23) have any effect on preschool handicapped developmental/intellectual child change.

- Ho<sub>8</sub>: There is no significant difference in amount of developmental change as assessed using the Marshalltown Behavioral Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.
- Ho<sub>9</sub>: There is no significant difference in amount of developmental change as assessed using the Alpern-Boll Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.
- Ho<sub>10</sub>: There is no significant difference between pretest Marshalltown Behavioral Developmental Profile quotient scores and Alpern-Boll Developmental Profile quotient scores when sorting on teacher locus of control.
- Ho<sub>11</sub>: There is no significant difference between posttest Marshalltown Behavioral Developmental Profile quotient scores and Alpern-Boll Developmental Profile quotient scores when sorting on teacher locus of control.
- Ho<sub>12</sub>: There is no significant difference in amount of intellectual change as assessed using a standardized intelligence test between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.

### Treatment III

One-way analyses of variance were employed to examine whether mother degree of locus control (internal group, scores 0-9; middle group, scores 10-12; external group, scores 13-23) had any effect on preschool handicapped developmental/intellectual child change.

- Ho<sub>13</sub>: There is no significant difference in amount of developmental change as assessed using the Marshalltown Behavioral Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group and children whose mothers are in the external locus of control group.
- Ho<sub>14</sub>: There is no significant difference in amount of developmental change as assessed using the Alpern-Boll Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group.
- Ho<sub>15</sub>: There is no significant difference in amount of intellectual change as assessed using a standard intelligence test between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group.
- Ho<sub>16</sub>: There is no significant difference between pretest Marshalltown Behavioral Developmental Profile quotient scores and Alpern-Boll Developmental Profile quotient scores when sorting on mother locus of control.
- Ho<sub>17</sub>: There is no significant difference between posttest Marshalltown Behavioral Developmental Profile quotient scores and Alpern-Boll Developmental Profile quotient scores when sorting on mother locus of control.

#### Treatment IV

Multiple regression was utilized to explore the possibility that several independent variables would combine their predictive value in order to improve the prediction of the dependent variable.

- Ho<sub>18</sub>: There is no significant relationship between developmental change as assessed using the Marshalltown Behavioral Developmental Profile and the following single or combined variables:
- a. PIE (Parent Internal-External locus of control)
  - b. TIE (Teacher Internal-External locus of control)
  - c. Sex
  - d. Pretest IQ
  - e. Pretest age

- Ho<sub>19</sub>: There is no significant relationship between developmental change as assessed using the Alpern-Boll Developmental Profile and the following single or combined variables:
- a. PIE
  - b. TIE
  - c. Sex
  - d. Pretest IQ
  - e. Pretest age
- Ho<sub>20</sub>: There is no significant relationship between intellectual change as assessed using a standardized intelligence test and the following single or combined variables:
- a. PIE
  - b. TIE
  - c. Sex
  - d. Pretest IQ
  - e. Pretest age

The expansion of twenty null hypotheses to include twelve sub-null hypotheses will appear in the section on Findings.

The results of investigating the secondary concern of the study, i.e., the six t tests and six one-way analyses of variance conducted to determine if component categories of the Marshalltown Behavioral Developmental Profile are individually influenced by mother/teacher attitude about personal control, will appear in the Findings.

### Definitions

To illuminate intent and facilitate ease of reading, the following definitions are used in this study:

1. Attitude: consistent tendency to think and feel positively or negatively about a particular issue. The emotional element is the primary factor which separates attitudes from beliefs and opinions. Locus of control is an example of a specific attitude.

2. Child change: The pretest posttest developmental and/or intellectual difference, as assessed on the Marshalltown Behavioral Developmental Profile, the Alpern-Boll Developmental Profile and a standardized intelligence test.

3. Teacher: The home advisor, a paraprofessional home teacher, trained by the Preschool Division of Area Education Agency 6, whose primary goal is to promote and enhance parent teaching techniques.

4. Locus of Control: The internal-external control of reinforcement dimension (I-E) distributes individuals along a continuum with regard to a generalized expectancy concerning whether or not the individual possesses or lacks power over what happens to him/her and the degree to which he/she accepts personal responsibility for his/her behavior and life experiences (Foulds, Guinan, & Warehime, 1974).

5. Preschool handicapped child: A preschool child who has any condition that places him/her "at risk," i.e., prevents the achievement of optimal growth and development in any of the social, emotional intellectual, linguistic, or physical realms.

#### Delimitation

This study has been limited to the preschool handicapped children and their mothers within Area Education Agency 6 (AEA 6) and the Home Advisors of the Marshalltown Project. The Marshalltown Project is a program sponsored by the Preschool Division of AEA 6, which provides services to Matshall, Poweshiek, Hardin, and parts of Grundy and Tama counties. The

particular population served included preschool children from one to six years of age during the 1973-1976 academic years.

Inferences from the analyses of these data obtained in the study are valid if they refer to the Area 6 population that was used to procure these data. Caution must be utilized in generalizing to other populations since such inferences may be subject to considerably more error. However, it is entirely appropriate to apply the strategies used in this study to other investigations concerning parent/teacher locus of control and impact on preschool handicapped child development.

### Overview

In Chapter 1, the author has traced the recent history of interest in early childhood education and concomitant monies provided for educational involvement with handicapped preschool children. Background and scope of the study traced the history of early stimulation studies. From the Intervention Mandate, several intervention models emerged to serve handicapped children. Teaching techniques have been widely explored in parent training programs, but the adult attitude, as it pertains to control over one's destiny and the responsibility one has for effecting change, has not been explored as a child change variable.

Chapter 2 will be a review of the literature investigating possible relationships of adult internal-external locus of control to handicapped preschool child change.

In Chapter 3 the method of procedures, including the design, materials, data collection, and treatment of data will be presented. The results

of the statistical analyses will be presented in Chapter 4. Chapter 5 will contain the summary, discussion and recommendations.

## REVIEW OF LITERATURE

Historically, researchers working with disadvantaged children have found that environmental inadequacy (deprivation) is a primary factor leading to progressive intellectual retardation and the inability to cope effectively in an increasingly complex society (Gilmer, Miller & Gray, 1970; Goldfarb, 1955; Kirk, 1958; Skeels & Harms, 1948; Spitz, 1973).

Emphasis has generally focused on institutionalized children rather than children in the home, but during the 1960's investigators began exploring parental influence as a variable in early handicapped child performance. Klaus and Gray (1968) found that home visiting teacher contact with mothers in their Early Training Project paid a generalizable dividend. Younger siblings of an experimental group were compared with the younger siblings of control groups. A significant thirteen-point IQ superiority of the experimental siblings over the control groups' siblings was found to exist. The Early Training Project thus became one of the earlier projects to begin systematically exploring the influence that working with mothers might have upon performance in children.

More and more evidence (Gordon & Lally, 1969; Karnes, Hodgins & Teska, 1969; Levenstein, 1970) has been reported to support the importance of involving parents in the education of their young children. Participating parents have been found to be not only instrumental in child change but also major contributors to the sustaining of positive effects after a project experience ends.

Bronfenbrenner (1974) reviewed five preschool and two home-based intervention programs and concluded that the family is the most effective and economical system for fostering and sustaining the development of the child. The effects of intervention, at least in the cognitive sphere, appeared to erode rapidly after the programs ended if the families were not involved as active participants. Involvement was described by Tymchuk (1975) as parents being taught to take an active part in the training of their child. He reported that results of parent success in child training is often an improved attitude towards the child. Such attitude change is usually demonstrated by greater acceptance of that child along with more positive feelings toward the child.

Shipman (1977) found that, by assessing attitudes and child rearing values of families involved, child change was more accurately predicted than when usual classifications by family structure, ethnicity and income were used.

Even though research in early education has increased, with parent education receiving more attention, the emphasis placed on parental attitude has been minimal. Generally, any influence adult attitude might have on child change has been viewed as incidental.

Croake and Glover (1977), in a review of parent education, identified two major focal points: (a) the increasing education of parents in behavior modification techniques enabling parents to exercise more effective influence on the behavior of their children, and (b) the use of a specific curriculum in parent discussion groups advocating more democratic methods

of child rearing. In this review, however, attitude is not mentioned as a possible contributing variable to successful parent-child interaction.

Of particular interest to this investigator is an attitude about personal control or effectiveness in coping with life tasks. Are significant adults' expectations about the ability to control or effect change in the personal environment related to the growth a handicapped preschool child might attain?

An expectancy about control or the construct, perceived control, is referred to in social learning terms as a generalized expectancy of internal or external control of reinforcement (Locus of Control):

The formal terms, the generalized expectancy of internal control, refer to the perception of events, whether positive or negative, as being a consequence of one's own actions and thereby potentially under personal control. The generalized expectancy of external control, on the other hand, refers to the perception of positive or negative events as being unrelated to one's own behavior and thereby beyond personal control. (Lefcourt, 1976, p. 29)

If one expects not to be successful in various endeavors, "because it's beyond my control," it would appear that such an attitude might have some influence on any personal attempts at promoting child change through interaction.

This study is designed to investigate the relationship of mother and teacher attitudes concerning locus of control to preschool handicapped child change. The focus is not on child attitude but rather the effects a specific mother and/or teacher attitude (internal-external locus of control) might have on preschool handicapped child intellectual and developmental progress.

"Since Rotter's (1966) and Lefcourt's (1966) comprehensive reviews of the study of the internal-external control variable were published, a substantial amount of research in support of the construct has accumulated" (Joe, 1971, p. 619). However, a review of the literature related to the central theme of this study indicated that although there has been much research in locus of control, in both education and psychology, there has been little impact on current trends in special education (Lawrence & Winschel, 1975). Both child and adult locus of control have been addressed separately, within the social learning literature, but there is very little that specifically deals with the relationship between parent/teacher LOC and preschool handicapped child achievement.

Since a number of studies have been conducted to ascertain the relationship between adult attitude about control versus lack of control and behavioral responses to environmental stimuli, it would seem reasonable to assume that the adult population in this research study (parents and teachers) might respond similarly to subjects reported in the literature.

To facilitate organization, both for the reader and this writer, the more commonly reported relationships between the locus of control attitude and behavioral response have been reviewed. The following general categories appear sufficiently representative of LOC research to be both relevant and generalizable to this study of parent/teacher locus of control impact on preschool handicapped child development: (a) Control of Environment, (b) Parental Antecedents, (c) Anxiety, (d) Adjustment, (e) Self-Esteem, and (f) Achievement.

## Control of Environment

An important kind of data involved in the construct validity of the internal-external control dimension includes the attempts of people to better their life conditions and to control their environments in important life situations.

If internals do possess a stronger generalized expectancy that reinforcement will be contingent upon their own behaviors, then they should be significantly more active than externals in seeking relevant information which will enhance mastery or control over their environments. At the very least, such information would allow one to deal more effectively with the world.

Seeman and Evans (1962) measured how much patients in a tuberculosis hospital knew about their own condition, how much they questioned the medical staff about their own condition, and how satisfied they were with the amount of feedback they were getting in regard to their medical status. It was found that internals knew more about their own conditions, asked more questions, and were less satisfied with feedback from the hospital personnel. Relatively speaking, it appeared internals attempted to gain a greater degree of control over their life situations than did externals.

Seeman (1963) assessed the social learning of inmates in a federal reformatory using a 40-item variant of the current I-E scale. Consistent with Seeman and Evan's results, it was found that internals were more knowledgeable about the manner in which the reformatory was run. They were more familiar with policy, changes in policy, long-range economic

facts that could possibly affect future release, parole regulations, and other pertinent information that might affect them as prisoners. All prisoners were exposed to the same information in an incidental fashion. Again it appeared that the more externally oriented individual did not acquire the kind of information that facilitated coping with the world in a more effective way. The Seeman studies suggest that internals were more knowledgeable, at least in terms of personally relevant information, than externals. Such knowledge is important if the individual seeks to exert control over the environment.

Phares (1965) selected a group of students matched for their attitudes towards maintaining fraternities and sororities on campus but split as to internality-externality on the I-E Scale. Both groups were instructed to act as experimenters to change the attitudes of other students. The internal-subject experimenters were significantly more successful than the external-subject experimenters in changing attitudes of other students. The external-subject experimenters did not differ significantly in the amount of change achieved from a control group who were not subject to any influence condition.

James, Woodruff, and Werner (1965) found that nonsmokers were significantly more internal than smokers. It was found that those who read the Surgeon General's report on the hazards of smoking and then quit for a specified period of time were more internal than those who believed the report but did not quit smoking.

Hersch and Scheibe (1967) noted that internal college student volunteers working in mental hospitals were more effective in working with

mental patients than external students. The subjects were members of the 1964, 1965, and 1966 Connecticut Service Corps which for all three years consisted of college volunteers who spent eight weeks working on selected chronic wards of Connecticut's four state mental hospitals. The 1965 and 1966 control group subjects consisted of groups of college students attending summer school who were comparable in age, education, and marital status to the experimental subjects. At the end of the summer, each experimental subject was assigned an effectiveness rating based on the combined ratings of peers and supervisors using eight 7-point scales. In 1964 and 1965 those rated most effective were the internally oriented individuals. There was no significant relationship among the 1966 data.

Phares (1968) compared internals and externals in their use of information for decision making. All subjects were presented ten items of information about each of four men and kept at task until they were able to recall that information without error. After a one-week interval, the subjects were asked to guess which of ten occupations, and who of eight girls, were best suited to each of the four men. Internals gave 50% plus more reasons than externals. Internals gave more than three times as many correct reasons as externals for justifying their social and occupational matchings. These differences led Phares to conclude that even though internals and externals begin with equivalent funds of information, the internals make better use of information.

Lefcourt and Wine (1969) had subjects interview other persons who maintained eye contact and avoided eye contact. Internals looked at an experimenter's assistant who behaved in a restrained aloof manner studi-

ously avoiding eye contact more often than at a more conventionally behaving assistant. Externals looked at a second assistant who behaved in an appropriately pleasant manner and engaged in eye contact (conventional) more often than internals. Lefcourt and Wine determined that when there are uncertainties in a situation, internals are more likely to look for relevant cues than are externals.

Dweck and Repucci (1973) found that when their subject children were exposed to continued noncontingent failure, the performance of some children deteriorated, while the performance of others did not. All the subjects were motivated to succeed and all had the ability to do so. The subjects in the persistent groups were significantly more likely to assume responsibility for failures involving motivational deficiencies than were subjects in the less persistent groups. Learned helplessness was utilized, as a term, to explain the latter condition and indeed appears to have merit in describing the tendency to attribute failure to the influence of external factors and ignoring the role of personal motivation. "Learned helplessness" suggests a feeling of powerlessness to control the outcomes of events.

Ducette and Wolk (1972) used a simple problem-solving tasks for which a nonverbal cue from the experimenter suggested the solution to the problem. Internals took significantly fewer trials to discover the rule. This study seems to have demonstrated several things: (a) internals rely more effectively on experience to improve perception of performance on test data, (b) internals are more successful in remembering successes with

feedback, and (c) internals can more often deduce rules from ambiguous situations and use these rules to solve a problem.

Phares (1976) reviewed a number of experiments with many different populations in a variety of situations and concluded that internals' attempts at attaining mastery over the environment were confirmed in the field as well as in the psychological laboratory:

To a great extent the superior mastery and coping of internals seems to be accomplished through their superior cognitive processing activities. They seem to acquire more information, make more attempts at acquiring it, are better at retaining it, are less satisfied with the amount of information they possess, are better at utilizing information and devising rules to process it, and generally pay more attention to relevant cues in the situation. (p. 78)

In summary, this group of studies tends to support the hypothesis that internals, as opposed to externals, exert more effort at coping with or attaining mastery over their environments by seeking more information and adopting behavior patterns which facilitate personal control.

#### Parental Antecedents

Rotter (1966) summarized several experiments which define group differences in behavior when subjects perceive reinforcements as contingent on their behavior versus chance or experimenter control. Rotter concluded that "one obvious antecedent worthy of study would be the consistency of discipline and treatment by parents . . . unpredictable parents would encourage the development of attitudes of external control" (p. 24).

Katovsky, Crandall, and Good (1967) reported that certain parental behaviors; i.e., protective, nurturing, approving and nonrejecting be-

haviors, were associated with the child's belief in internal control. Caution was recommended against assuming self-report and observational data to be equivalent. Too many subjective variables such as social desirability, defensiveness, and self-serving facets of memory appeared to be influencing the self-report data.

Davis and Phares (1969) and Nowicki and Segal (1974) investigated some antecedents of children's generalized locus of control. Both studies examined parent child-rearing attitudes, children's reports of parental behavior, and parent's own locus of control beliefs as determinants of the child's beliefs. Internals reported their parents showed less rejection, less hostile control, less withdrawal of relations, and more positive involvement. No relationships were found between parent child-rearing attitude concerning control and rejection and the child's locus of control beliefs. Also no relationship was found between parents' locus of control and that of the child.

Tolor and Jaloweic (1968) explored the relationship between an external attitude and both authoritarian control and hostility-rejection. Externally oriented subjects perceived themselves as being highly authoritative and possessing hostile rejecting tendencies. The authors concluded that mothers with such traits might be contributing agents to the development of external attitudes in their children.

MacDonald (1971) collected retrospective reports of parental behavior and a measure of internal-external locus of control from 427 (192 male and 235 female) undergraduate students. Relatively greater internal control orientation was found to be associated with (a) low maternal deprivation

of privileges, (b) high maternal predictability of standards, (c) low maternal protectiveness, and (d) high maternal and paternal nurturance. A distinction was made between nurturance and protectiveness in that the former was viewed as being subsumed under a dimension labeled "supporting" whereas protectiveness was considered to be found under the dimension labeled "controlling." The controlling parent implies an unwillingness to allow autonomy. Internally oriented students generally described their parents as being warm (nurturant), consistent, (predictable) and as encouraging their children to try to control their own reinforcement (achievement pressure). Externally oriented students generally described their parents as being over-protective, privilege-depriving, and utilizing affective punishment. The externally oriented students also described their parents as using techniques which are more likely to give an impression that one's reinforcements are externally controlled.

Stephens and Delys (1973a) found the quality of the "total" maternal relationship variable most consistently related to the child's internal-external control (I-E). Stephens concluded that sufficient evidence exists attesting to the efficacy of manipulating I-E in early childhood through parent education and consultation programs.

Stephens and Delys (1973b) developed a Reinforcement Contingency Interview to assess locus of control expectancies of preschool aged and older children. Parent behavior antecedents of locus of control development in the preschool years was investigated. Evidence reflected a stable locus of control phenomenon in young children. Also, moderately high internal scores appeared to be associated with nurturant and nonrestrictive

mothers whereas very high internal scores appeared to be the product of different mother-child interactions; e.g., experiences with coercive, perfectionistic, ambitious, and achievement-oriented mothers. A tendency toward curvilinear relations of Stephens-Delys test scores with performance scores was noted.

Scheck, Emerick, and El-Assal (1973) reversed the investigating focus by examining the child's interpretation of the interaction between self and parents. Thus, they viewed the child's own definition of the situation as more significant than examining data derived from parental reports or observations of parental behavior. Using data collected from a sample of male adolescents, they attempted to ascertain the relationship of I-E and (a) inconsistency in parent discipline, (b) disagreement in parental expectations, (c) parental restrictiveness or permissiveness, and (d) parental support. Scheck et al. concluded that parental support is more highly associated with I-E than parental consistency, disagreement in parental expectation, or parental constraint.

Nowicki and Segal (1974) assessed perceived parental behavior associated with locus of control orientation. One hundred twelve high school seniors (58 males and 54 females) responded to one child form and two adult forms of locus of control tests. The students were asked to complete the child form as they perceived themselves to be and one adult form as they perceived their mothers would complete it, then the second adult form as they thought their fathers might complete it. For females, internality was associated with greater perceived maternal and paternal physical contact, trust and security, and paternal affection. For males,

internality was associated with greater perceived maternal affection. Both males and females saw their parents as essentially possessing the same locus of control orientation as their own. It was concluded that perceived parental nurturance and locus of control seem to be involved in the development of locus of control orientation, especially in a cross-sex sense.

In summary, those parental antecedents most often linked to children who develop an internal locus of control can be characterized as warm, supportive, positive, and nurturant behaviors. Many externally oriented individuals are described as having grown up with cold, rejecting, negative parents.

### Anxiety

Social learning theorists have often viewed anxiety as a series of responses which indicate a high expectancy for punishment or failure or a low expectancy of success in a valued need area. External individuals would be expected to exhibit relatively high expectancies for punishment and therefore display greater anxiety than internals.

Butterfield (1964), using the Alpert-Haber Facilitating-Debilitating Test Anxiety Questionnaire, found that external control was positively related to debilitating anxiety and negatively related to facilitating anxiety. Facilitating anxiety is sometimes described in the social learning literature as eagerness or motivation. Debilitating anxiety is the opposite, as when one becomes "blocked" and avoids an issue. Lefcourt (1976) describes facilitative anxiety as having "a sense of excitement in

challenge" and debilitating anxiety as "a surrender and shrinking away from encounter" (p. 89).

Watson (1967) also explored relationships between locus of control, and facilitating and debilitating anxiety. Six hundred forty-eight college students were given the I-E Scale, the Manifest Anxiety Scale (MAS), and the Alpert-Haber Scale. Positive relationships were found between the I-E Scale and the MAS, between external control and debilitating anxiety, and a negative relationship between external control and facilitating anxiety of the Alpert-Haber Scale.

Kiehlbauch (1968) found that reformatory inmates scored high in externality upon intake, scored lower during the middle part of their imprisonment, and then scored higher again before release. Such a phenomenon suggests that situational, as well as dispositional, variables contribute to the degree of external orientation at any given time. Kiehlbauch found that both I-E scores and anxiety scores showed a curvilinear relationship with length of stay in the reformatory. Recently confined prisoners were more external and anxious because of uncertainties about the strange environment. As the prisoners became more familiar with new rules and expectations of others, anxiety and externality declined. When release time drew near, uncertainties returned. Inability to predict and control acceptance by others, assurance of employment, and concern for the impending unknown resulted in higher externality and anxiety. It was concluded that by interjecting greater stability and certainty into people's lives there should be an increase in internal beliefs and, con-

versely, greater externality could be induced through increased uncertainty and felt lack of control.

Nelson and Phares (1971) administered the I-E Scale and an academic I-E scale to an introductory psychology class of 280 college students. Three groups were formed--internal, middle, and external, comprised of 14 subjects each for a total of 42. The three groups, differing in degree of internal-external control, were administered measures of anxiety, need value, and expectancy for success in both academic and love/affection areas. External control of reinforcement was associated both with greater anxiety and with the discrepancy between need value and expectancy in the academic area. Although the directional relationship between anxiety and the discrepancy between expectancy and need value in the love and affection area was not significant, it was not contrary to prediction. The results were consistent with other studies which have reported a relationship between anxiety and externality.

Strassberg (1973) cued off the Nelson and Phares study (1971) in an attempt to gain a better understanding of the relationship between locus of control, anxiety, and expectation of valued-goal achievement. Undergraduate volunteers; i.e., 55 male and 86 female students, were required to complete the Rotter I-E Scale, the IPAT Anxiety scale, and a questionnaire designed to measure the subjects' expectations of achieving valued goals. Regression analysis indicated that the combination of locus of control and valued-goal expectation scores predicted anxiety scores significantly better than either of the former measures used alone. The authors concluded that there was a significant relationship between locus

of control and anxiety for both males and females. Also, it was found that a lower expectation of achievement of valued goals is associated with both higher levels of anxiety and greater externality.

The research suggests that externals tend to describe themselves as more anxious, apprehensive, worried, and fearful; internals tend to describe themselves as less anxious. However, cause and effect are seldom demonstrated; i.e., does externality cause anxiety, or is the reverse true?

### Adjustment

Hersch and Scheibe (1967) explored the relation of I-E to maladjustment by comparing I-E scores with scores yielded by the California Psychological Inventory (CPI), the Adjective Checklist Test (ACL), Incomplete Sentences Blank (ISB), the Psychothetic (PT) scale of the Minnesota Multiphasic Personality Inventory (MMPI), and the discrepancy between self- and ideal self-descriptions as computed for each of the ACL scales. I-E was found to relate consistently to measures of maladjustment, with persons having high internal scores being less maladjusted. I-E was also found to be related to a variety of personality scales with internal scorers describing themselves as more striving, achieving, active, powerful, independent, and effective. These data suggested that internally oriented scorers were a more homogeneous group than the external scorers. It was concluded that internality was associated with indexes of desirable social adjustment.

Harrow and Ferrante (1969) investigated three questions related to locus of control and an acute psychiatric population ( $n = 128$ ): (a) Do psychiatric patients become more internal as their manifest pathology decreases? (b) If there are any changes in internality or externality, are they related to the patients' type of disorder (their formal diagnosis)? (c) Are changes in patients' attitudes about locus of control related to age or sex? The results suggest that patients with greater psychopathology and fewer social skills (e.g., schizophrenics, younger patients, and, to a slighter extent, males) were more external. The nonschizophrenic patients, excluding manics (e.g., depressives and character disorders), tended to become more internal as they improved during the six-week period between testings. A speculation submitted for the move toward internality was that as the problem requiring hospitalization was relieved, the patients began the process of returning to previous, moderately successful adaptation.

Smith (1970) examined Rotter's Internal-External (I-E) scale in relation to life crisis and crisis resolution. It was assumed that during crisis an individual's usual coping mechanisms have failed and that the individual can make significant positive changes in a short period of time by learning new and more adaptive behaviors. Also, as crisis patients are overwhelmed by external forces in their lives, they initially are more externally oriented on the I-E scale than similar noncrisis patients. Smith hypothesized that crisis patients, during a six-week crisis resolution period, would show a significant shift toward the internal end of the dimension while the noncrisis patients would show no significant I-E

shift. The crisis group consisted of 30 patients who appeared at the Neuropsychiatric Emergency Room of the UCLA Medical Center because of acute life crises. The group consisted of 10 males and 20 females. The noncrisis group consisted of 15 male and 15 female outpatients who were beginning long-term psychotherapy. The results were consistent with the hypotheses and offered tentative support for the belief that crisis intervention can produce positive personality change in a brief period of time. In this instance the positive personality change was the patients' moving toward the internal locus of control.

Warehime and Foulds (1971) hypothesized a low linear relationship between internality and self-actualization, one conception of ideal personal adjustment. A group of 55 male and 55 female college students were given the Internal-External Control of Reinforcement (I-E) scale and the Personal Orientation Inventory (POI). The POI purports to measure the degree to which persons seek to develop and utilize all of their unique capacities (potential) and their degree of freedom from the inhibitions and emotional turmoil that characterize those who are less self-actualized. The results on the index of personal adjustment appeared to support the hypothesized relationship between internality and personal adjustment more strongly for females than for males. In a previous study (Warehime & Woodson, 1970) internally oriented males reported more positive effect on instrumental activity dimensions while internally oriented females reported more positive effect on immediate feeling dimensions. It was speculated that internally oriented males in this population felt that they had control over their reinforcements for different reasons than the

internally oriented females. It was also concluded that the POI might measure a type of personal adjustment not as highly valued by males as by females.

Gilbert (1976) tested a model of psychological adjustment in which it was postulated that increased internality for some college students occurs as a result of regaining control over stressful environmental events as opposed to learning a different generalized perception of their world. Two groups of students served as subjects: 59 males and 64 females who sought counseling at the university's counseling service (clients) and 169 males and 255 females enrolled in a cross-section of courses (nonclients). The client and nonclient groups were administered the I-E scales under two different instructional conditions: first as they viewed themselves and their world in the recent past (situational I-E), and second as they typically viewed themselves and their world (characteristic I-E). It was hypothesized that there would be no difference between characteristic I-E scores of the client and nonclient groups but clients prior to counseling would be the more external in regard to recent events. Clients did report greater externality than nonclients ( $p < .01$ ) for recent events. Clients also reported greater externality with the advent of crisis than characteristically was reported ( $p < .05$ ).

These data seem consistently to relate stress to increased externality and the regaining of control with parallel movement along the LOC continuum towards internality. But, Phares (1976) cautions against viewing persons as adjusted or maladjusted based solely upon I-E scores. To surmise that by exhibiting greater mastery and personal efficacy, more

resistance to control or influence from others, and more achievement orientation, internals have superior adjustment, would be proper only if one's criteria of adjustment include such behaviors.

### Self-Esteem

Smith (1970) describes self-concept as being highly resistant to change in psychotherapy. He makes a distinction between the strong and stable structure of self-concept and temporary or momentary self-perceptions. The latter, even though subject to pressures toward internal or external consistency, eventually parallel the person's enduring self-concept.

Fitch (1970) has reported a low but significant positive rank order correlation between locus of control and self-esteem. Specifically, low self-esteem subjects tended to score as externals.

Ingram (1972) conducted a study to assess whether or not high school students who were participating in an Upward Bound summer program differed from other students who were not enrolled in the summer program in such areas as internal versus external locus of control and self-esteem. Female subjects were discovered to be more internal than males and the author concluded they felt more responsible for academic outcomes. Males' locus of control dispositions reflected an external orientation. Program participants were found to be more external than nonparticipants across certain grade levels, but 10th and 11th grade male participants had a higher self-esteem than same grade level males not involved in the program.

Bryant (1974) found that externals attributed significantly more negative attributes to their teachers and themselves than did internals. External children attributed a larger range of negative attributes to themselves than the teachers attributed to the external children. The results suggested that externals are more intropunitive, as well as extra-punitive, in their thinking than are internals. The study found that disturbed relationships with teachers were more common for external children than more internal children.

Tetenbaum and Houtz (1978) administered problem-solving and creative measures to 127 gifted school children from grades 4-6. They then related these cognitive variables to the affective traits of locus of control, self-esteem, and tolerance of ambiguity. Locus of control was defined as an individual's tendency to perceive his reinforcement as deriving either from within himself or from forces beyond his immediate control, and self-esteem was defined as an individual's evaluation of himself, an attitude which reflects the extent to which the individual believes he is capable, significant, successful, and worthy. Low correlations (.11 to .37) among the three affective measures were considered to be justification for their inclusion as relatively independent influences on problem-solving and creative performance. The highest correlation ( $r = .37$ ) was between locus of control and self-esteem. Relatively low correlations between locus of control and self-esteem would indicate that the two are not identical phenomena. Also the research tends to discriminate between male and female response patterns and corresponding relationships between LOC and self-esteem. It has been suggested that the differences are artifacts of

the testing instruments used to make the self-esteem comparison to locus of control. In summary, although locus of control and self-esteem are not identical, researchers still intuit that internal locus of control and positive self-esteem are a common and frequent occurrence.

### Achievement

Franklin (1963) hypothesized 17 relationships of the I-E scale to reported evidences of achievement motivation among a nationally stratified sample of 1000 high school students. Reported evidence included such behaviors as early attempts to investigate colleges, parent interest in school homework and "higher education," amount of time students actually spent in doing homework, etc. A significant relationship was found in the predicted direction in 15 of the 17 relationships.

Efran (1963) studied high school students' tendencies to forget failures versus successes and found that internals tended (significantly) to forget failures. The results suggested that externals have less need to "repress" failures since they have already accepted the fact that both success and failure are out of their hands--determined by external forces. The internal-external phenomenon was described as influencing striving for achievement with internals being more strongly motivated to achieve.

Rotter and Mulry (1965) found under both skill and chance conditions that internals tend to value reinforcements for skill much more than chance and that, although externals took longer to perform a task under chance conditions than skill conditions, the difference was not signifi-

cant. The results were interpreted as supporting the idea that internals have stronger motivation in achievement situations than externals.

Hersch and Scheibe (1967) saw in their data support for the conclusion that internality (locus of control) is consistently associated with indexes of social adjustment and personal achievement.

Messer (1972) found that the results for an n of 76 fourth grade boys and girls tested on the Stanford achievement test were in the direction of higher achievement scores for high internals, but statistical significance was not obtained. Messer interpreted the results as lending support to the position that children with an internal locus of control achieve higher school grades.

Horner (1972) found that women are faced with an achievement related conflict. The motive to avoid success is couched within the framework of an expectancy-value theory of motivation. The successful female will expect that success in achievement-related situations will be followed by negative consequences--all qualities positively related to masculinity and mental health such as competence, independence, competition, and intellectual achievement. She will then feel less adequate as a female because she will be displaying qualities usually inconsistent with femininity. One obvious way of coping is to disengage--to compete less intently or visibly. Horner emphasized that many women are success-avoidant for fear of demonstrating more ability than significant men in the proximate environment and fear of the following disapproval and rejection from those "significant" men.

Karabenick (1972) classified subjects according to their locus of control scores and then plotted valence curves for failures and successes against varying probabilities of success. Each subject was asked how much satisfaction was attained from success and how much dissatisfaction resulted from failures in given tasks with designated difficulty levels. When the tasks were perceived as being very difficult, internals were found to value success more than externals. The reverse was found for perceived easy tasks. The dissatisfaction resulting from failure was greater for internals than for externals when the task was perceived as easy and greater for externals than for internals when the task was seen as being difficult. It was felt that the affective responses of internals was more in accord with what might be expected from realistic goal-directed, achievement-oriented individuals.

Gozali, Cleary, Walster, and Gozali (1973) found that internals require more time before answering difficult than easy problems. Time lag for externals was found to vary less with item difficulty, possibly indicating that externals exhibit less adaptability to task demands than internals. The authors felt that such differences in responding might be the variable accounting for the major portion of the relationship between locus of control and achievement motivation.

Strassberg (1973) interpreted his findings as indicating that lower expectation of achievement of valued goals is associated with greater externality.

Other studies that have investigated the relationship of locus of control to achievement (Coleman, Campbell, Hobson, McPartland, Mood,

Weinfeld & York, 1966; Nowicki & Walker, 1973) suggest a general presumption that locus of control is related to achievement with high achievement being associated with internality.

Nowicki and Walker (1973) felt that there has been some inconsistency in the findings concerning the relationship between achievement and locus of control for females. They speculated that such inconsistency may have been the result of not obtaining groups of "pure" internal and external females. Their results suggest that expressed locus of control is a better predictor of female social rather than female academic achievement behavior. They conclude:

There seems to be some reason to believe that expressed locus of control may mean different things to males and females. For males locus of control may be a more pure prediction of academic achievement, while female expressed locus of control may be a more pure predictor of social behavior. (p. 35)

Smith and Troth (1975), in analyzing their data ( $n = 54$ ), found that an achievement motivation training program was significantly effective in increasing achievement motivation level and in reducing external control feelings. The treatment was ineffective in reducing fear of failure and had no effect in participants' grades in the program nor the ratings given by their instructors. Achievement motivation, or need to achieve, was viewed as a general striving to do things better, faster or more efficiently in a number of areas but not necessarily correlating positively with grades or other criteria related to the traditional academic setting. The training program was organized into three major phases: (a) cognitive teaching, (b) in-group experiencing and modeling behavior, and (c) out-group application. It was felt that certain ingredients were associated

with successful programs such as structure, lengthy rather than brief exposure, cognitive as well as affectively toned counseling, empathic and genuine therapeutic conditions, and goals appropriate to student needs. The latter condition may be most often violated in attempts to move others into higher motivation positions. Smith and Troth (1975) felt that each individual should be carefully assessed to determine approximate functioning levels of dependent to independent development. The organization of sequential events or experiences that fit developmental stages of individuals was found to facilitate both change in locus of control and motivation.

Lawrence and Winschel (1975) suggested the probability that achievement also affects locus of control. In other words, awareness of achievement or success also promotes a sense of personal control over one's accomplishments. Five stages of development were postulated for children but may well describe, generally, anyone moving in maturity from dependence to independence, nonstriving to an achievement orientation, or externality to internality.

- Stage I      The child attributes the events of his life, particularly failures, to forces beyond his control.
- Stage II     Internality for success begins to emerge while externality for failure, though still evident, begins to fade.
- Stage III    The maturing child becomes essentially internal, although this belief is principally evident in self-responsibility for success.
- Stage IV     The previous stage of development appears to be reversed as a growing awareness of responsibility and a sense of courage in the face of difficulty lead to high internality for failure coupled with a new modesty for one's successes.

Stage V      With the onset of genuine self-reliance, the individual accepts equally the responsibility for his successes and failures. (p. 487)

Chan (1978) considered two specific aspects of motivation to be locus of control and achievement motivation. In both motivational variables, expectancy is the common bond. General expectancies aid in the development of either internal or external feelings of control. The conclusion of this study was that locus of control and achievement motivation each appear to influence the approach to school-related tasks, interpretation of the outcome of tasks, selection of tasks, task persistence, and other achievement-related behavior.

In summarizing the results of research pertaining to locus of control and achievement performance and motivation, it would seem that locus of control rather consistently relates to performance but not to motivation. Phares (1976) suggests three possibilities for this discrepancy: (a) there are a number of defensive externals (internals who have relatively strong need for achievement but low expectancy for attainment because of prior experiences) who verbalize external beliefs as a protective device, (b) common motivational (paper and pencil) measures of need achievement are not as unidimensional as academic achievement tests, and (c) although a reasonable premise might suggest that successful achievers would tend towards an internal orientation, it is less reasonable to predict motivation for achievement in all task areas.

## Summary

Much research identifies internals as superior in their efforts to cope with and gain a measure of control over the environment. Belief in personal control seems to provide a definite edge in grappling with self-defined important events. Internal control expectancies appear to provide a connecting link between an individual's desires and his subsequent actions. External control, on the other hand, has been associated with helplessness, apathy, indifference, and resignation in respect to task approach and resolution because expectancy of, and in many cases hope for, success are not present. It is the contention in the present study that the externally oriented adults responsible for child care and education are not as encouraged as internals to become actively involved in affecting change simply because "my intervention won't make any difference. The final determination is out of my hands." The internally oriented child-care agents, believing that personal commitment and involvement can influence outcomes, are more likely to be found interacting nurturantly and persistently with the preschool handicapped children in their charge.

## METHOD OF PROCEDURE

Procedures used in this study are presented under the following headings: design, variables, sample, sources of data, data collection, and treatment of data. The purpose of this study was to examine the influence attitudes held by the mother and home teacher have on preschool child developmental progress. Specifically, does the degree to which mothers and teachers believe they are able to control the outcomes of situations in which they are personally involved have an impact on the progress made by preschool handicapped children who are participants in a prescriptive home intervention program? The independent variable was the degree of internality-externality (locus of control) perceived by adults who were responsible for the child's exposure to prescriptive teaching while enrolled in the home intervention program. The method of procedure is explained for the appropriate topics in the order indicated above.

### Design

The study employed a one-group pretest-posttest design (Borg & Gall, 1974). Developmental and intellectual pretests were administered each preschool child upon entry into a prescriptive home intervention program to begin recording data about the dependent variable, child change.

The treatment condition was mother/teacher attitude about the degree of control one has over the immediate environment (locus of control). Adult attitudes in general are known to be quite stable and are unlikely to change unless some significant effort is made to change them. Asch (1948) defined an attitude as a particularly enduring set formed by past

experience; Campbell (1950) described attitude as a syndrome of response consistency; and Rokeach (1968) considered an attitude to be not only a predisposition to respond in some preferential manner but also to be relatively enduring and stable through time. In fact, adult attitudes are usually so stable that most studies that have devoted considerable effort to changing attitudes have failed to bring about significant changes (Borg & Gall, 1974). Since attitude is considered to be a stable phenomenon, only a posttest measure on mothers and teachers was obtained.

Posttest developmental and intellectual measures were compared to pretest results for child-change data. Mother and teacher perceptions of personal control over the environment were compared to child change to ascertain whether degree of perceived control had any impact or influence on child change.

### Variables

Lefcourt (1976) considered readiness to perceive contingency between one's actions and outcomes to be an essential element in understanding how one comes to terms with daily experiences. There are those, influenced by their own experiences, who believe value reinforcements occur only by chance and others whose experiences have indicated to them that they are responsible for their own actions, that fate is more often than not only a logical consequence. Persons with such contrasting perspectives should differ considerably in the degree to which they involve themselves in tasks for the purpose of regulating or influencing results.

Thus, mother/teacher perceived control over outcomes (locus of control) was investigated for impact on preschool child change and was designated the independent variable. The difference when the pretest developmental and intellectual scores were subtracted from the posttest scores provided three dependent variables: (a) observed developmental change (Marshalltown Behavioral Developmental Profile), (b) surveyed developmental change (Alpern-Boll Developmental Profile), and (c) intellectual change. Sex and age were also selected as dependent variables to investigate their contribution to the interaction between mother/teacher attitude (LOC) and child change.

#### Sample

The target population served by the Marshalltown Project included all preschool children who had been diagnosed as handicapped. Through the screening, testing, and placement procedures, preschool children with diagnosed skill deficiencies and those considered "at risk" for future school failure were accepted into the program. Selection was also based, to a degree, upon the willingness of parents to participate actively in the program.

Age criteria for the Marshalltown Project started at birth and progressed to entry into the formal school system (kindergarten). Children were usually not accepted for service by the Marshalltown project unless they could be involved for a year before school attendance.

Ethnic composition was predominantly white (about 88 percent) with less than five percent Spanish-speaking and less than four percent black.

An Indian population of about three percent was served with the help of a home teacher employed by the South Tama school system and assigned to the Marshalltown Project for training and supervision.

About 40 percent of the children were from the city of Marshalltown, with 10 percent from outside the city in Marshall County. About 15 percent were from the city of Grinnell, and the remainder were rural children from throughout Area 6, which encompasses approximately 2400 square miles.

Sample size was determined by reviewing child change data and requesting locus of control information from participating mothers. There were 80 respondents and the  $n$  of 80 was thereby established.

#### Sources of Data

To assess the effects of the treatment, data were collected from instrumentation which essentially reflected child change and adult influence (perceived control as the independent variable in child change). A discussion of the sources of data follows.

The instrument administered directly to the child to determine developmental status and change was the Marshalltown Behavioral Developmental Profile (MBDP). The Alpern-Boll Developmental Profile (A-B) was administered to the mother or principal caretaker who answered questions about the child's development. The MBDP was used as a direct, observational measure whereas the A-B was used in a survey fashion. To assess intelligence, both the Stanford-Binet Intelligence Scale Form L-M (S-B) and the Slosson Intelligence Test for Children and Adults (SIT) were employed. Mother/teacher attitude (perception of control over outcomes) was

assessed by the Rotter Internal-External Control Scale (I-E). A copy of the Rotter Internal-External Scale (I-E) is found in Appendix A.

#### The Marshalltown Behavioral Developmental Profile

The MBDP follows a normal child developmental continuum, and target children are programmed on the basis of individual lag. The Profile, used to evaluate preschool handicapped children, contains 327 developmental items from birth through five years. All Profile skills are grouped into either communication, motor, or social categories.

The communication subscale (93 items) is comprised essentially of receptive and expressive language items, some of which are cognitive in nature. The items in the motor subscale (117 items) are made up of approximately 60 percent gross motor and 40 percent fine motor skills. In the social subscale (117 items) about 30 percent of the items sample social interaction with the remainder consisting of survival skills such as eating, dressing, and toileting behaviors. A copy of the Marshalltown Behavioral Developmental Profile is found in Appendix B.

Fuqua and Phye (1978) determined an index of reliability for the MBDP by measuring the internal consistency of the scale. The Kuder-Richardson 20 formula was computed for each of the three subscales. The Kuder-Richardson (KR-20) method focuses on the degree to which the items in the test are functioning in a homogeneous manner. The reliability coefficients were .97 for the communication subscale, .96 for the motor subscale, and .97 for the social development subscale. Test-retest reliability was computed for subscales as well as the full scale score with an n of 90 normal children. Coefficients were .80 for the communication sub-

scale, .80 for the motor subscale, .85 for the social subscale, and .87 for the full scale. Each item on the MBDP was weighted so that each month of developmental age corresponded with chronological age. Using a ratio formula  $DA/CA \times 100$  established a mean DQ of 100 around which dispersion scores varied for each of the scales. Standard deviations associated with the subscales were 16.86 for the communication scale, 15.23 for the motor scale, and 15.56 for the social scale.

Predictive validity of the MBDP was obtained through a concurrent validation procedure (Fuqua & Phye, 1978). The Alpern-Boll Developmental Profile (1972) was administered concurrently with the MBDP. Performances on the communication, physical development, and social subscales from the Alpern-Boll were correlated with performance on the communication, motor, and social subscales from the MBDP for 218 children. The correlation coefficient for the relationship between the communication subscales was .81 ( $p < .01$ ); the coefficient for the motor development subscales was .76 ( $p < .01$ ), and the coefficient for the social developmental subscales was .77 ( $p < .01$ ).

#### Alpern-Boll Developmental Profile

The A-B is an inventory of skills which has been designed to assess a child's development from birth to preadolescence. The inventory provides an individual profile which portrays a child's developmental age level functioning by ordering his particular skills according to age norms.

Alpern and Boll (1972) described the five areas of developmental age functioning (scales) as:

- Physical Age - This scale measures the child's physical development by determining his abilities with tasks requiring large and small muscle coordination, strength, stamina, flexibility, and sequential control skills.
- Self-Help Age - This scale measures children's abilities to cope independently with the environment and measures the child's skills with such socialization tasks as eating, dressing, and working. This scale evaluates the degree to which children are capable of responsibly caring for themselves and others.
- Social Age - This scale measures the child's interpersonal relationship abilities. The child's emotional needs for people as well as his manner in relating to friends, relatives, and various adults exemplify the skills which measure the child's functioning in the social situation.
- Academic Age - This scale measures the child's intellectual abilities by evaluating, at preschool levels, the development of skills prerequisite to scholastic functioning and at the school-age levels, actual academic achievements.
- Communication Age - This scale measures the child's expressive and receptive communication skills with both verbal and nonverbal languages. The child's use and understanding of spoken, written, and gesture languages are evaluated by this scale. (p. 1).

A 1971-72 standardization study provided normative information of 318 items for over 3000 "normal" children through maternal interviews. Ninety-eight percent of the population data were available for cross-classification on race by social class:

<u>Race</u>	<u>Lower class</u>	<u>Middle class</u>	<u>Upper class</u>
White	5%	84%	11%
Black	35%	62%	3%
Others	16%	65%	19%

The basic statistic in the validity study was the percent of agreement between the mother's statements regarding the child's skills and the child's actual skills. Scale-by-scale analysis for the Developmental

Profile resulted in a validity range from 84 to 88 percent with overall percent of agreement of 86 percent. Additional analyses indicated no significant or systematic differences as a function of race or sex of subjects.

Test-retest reliability data were collected by two interviewers administering the profile to mothers from two to three days apart. Ninety-two percent of the scores obtained by the two interviewers on different days were within three points of each other. The average scale point difference among all scale scores for all subjects was 1.74 points. The mean differences for all of the five scales were:

<u>Scale</u>	<u>Mean difference</u>
Physical	1.5 points
Self-help	2.4 points
Social	2.1 points
Academic	1.9 points
Communication	.8 points

The authors concluded from their reliability studies that the Alpern-Boll Developmental Profile generates scores with high scorer, reporter, and test-retest reliability.

#### The Stanford Binet Intelligence Scale Form L-M

The revised Stanford-Binet (Houghton Mifflin, 1960) retains the major characteristics of the older Binet-type tests. It continues to measure general ability rather than specific or related groups of abilities. It is an age scale making use of age standards of performance.

During a five-year period from 1950 to 1954, 4498 subjects ranging in age from 2 1/2 to 18 years were tested with the 1937 Stanford-Binet scales. Changes in difficulty of subtests were determined by comparing the percentages passing the individual tests in the 1950s with the percentages passing in the 1930s, which made up the original standardization group. The 1960 scale incorporated in a single form, designated as the L-M form, the best subtests from the 1937 scales. Criteria for selection of items were: (a) increase in percentage passing with age (or mental age) and (b) validity determined by biserial correlation of each item with the total score.

Validity for the 1960 scale was obtained from three sources: (a) the regular increase in mental age from one age to the next was compared to the increase in percentage passing from one chronological age to the next in both forms of the 1937 scale, (b) the choice of items was determined by their correlation with the total score on each form (internal consistency), and (c) the choice of items according to the mental age on the 1937 scale assured that the new scale was measuring the same thing that was measured by the original scale. In comparing, the mean biserial correlations in 1939 and 1960 of only those subtests used to make up Form L-M, relatively the same variation appears. The mean correlation for the 1960 scale is .66 as compared with a mean of .61 for all tests in both forms in the 1937 revision.

Reliability of the 1960 L-M Form was evidenced by the fact that for both Form L and Form M the biserial correlations remain high. Reliability

of the L-M Form is increased by the high level of biserial correlations between individual subtests and the total.

### Slosson Intelligence Test for Children and Adults

The SIT was designed (Slosson, 1963) as an individual screening instrument for both children and adults. It was designed for brevity and ease of administration.

A reliability coefficient of .97 (test-retest interval within a period of two months) was obtained on 139 individuals from age 4 to 50 years. The mean IQ's of the initial tests and of the retests were 99.0 and 101.3. The standard deviations were 24.7 and 25.1.

Concurrent validity was determined from the test results of 141 subjects. The test author administered the Stanford-Binet while the Slosson Intelligence Test was administered by a teacher, principal, guidance counselor, social worker, and nurse. Statistical data obtained independently between the Stanford-Binet Form L-M and the Slosson Intelligence Test were:

<u>Age</u>	<u>Number</u>	<u><math>\gamma</math></u>	<u>Mean</u>		<u>Standard deviation</u>		<u>Average difference</u>
			<u>SB-LM</u>	<u>SIT</u>	<u>SB-LM</u>	<u>SIT</u>	
4-19	141	.92	107.7	107.2	20.2	19.9	6.1

### The Rotter Internal-External Control Scale

The items on the I-E scale represent an attempt to sample internal-external beliefs across a range of circumstances, such as interpersonal situations, school, government, work, and politics. The scale is a 29-item forced-choice questionnaire with six filler items (see Appendix A). It was designed to sample a variety of areas rather than to predict behavior in one situation or one very homogeneous class of distinctions. The I-E

scale, because it is an additive scale designed to measure generalized expectancy across a range of situations rather than a power test which measures more specifically and restrictedly, will predict only moderately well across a number of situations. An additive test, by its make-up, does not have the internal consistency of a power test.

Rotter (1966) reported internal consistency scores ranging from .65 to .79 across a population variously comprised of high school and university students. Rotter also reported test-retest reliabilities, obtained from both university students and prisoners in a state reformatory, ranging from .49 to .83. Test-retest coefficients ranged from .47 to .84 for 10 groups of college students tested by Hersch and Scheibe (1967). Harrow and Ferrante (1969) published test-retest correlations for hospitalized psychiatric patients ( $df = 86$ ) ranging from .67 to .87.

Discriminant validity is indicated by the relatively low relationships with such variables as intelligence and social desirability. Rotter (1966) with an  $n$  of 259 found correlations with intellectual measures ranging from .03 to -.22. With an  $n$  of 995, correlations with the Marlowe Crowne Social Desirability scale ranged from -.12 to -.41. From a psychometric point of view, test-retest reliability of the I-E scale appears adequate (Lefcourt, 1976).

#### Data Collection

This investigator, as Director of the Marshalltown Project from 1973 to 1977, was able to monitor the collection of data; i.e., set timeline

for posttests; observe individual child growth; note parent consistency, persistence and degree of involvement; and review data recording.

As a general rule the data collection for this study followed the assessment procedures of the Marshalltown Project, which progressed through several stages.

- (1) After receiving a referral, parents were contacted by a home teacher, and a child was assessed using the Marshalltown Behavioral Developmental Profile (MBDP).
- (2) If deemed eligible after staffing the MBDP results, the parents were surveyed using the Alpern-Boll Developmental Profile (A-B).
- (3) The project evaluator, a psychologist, then assessed the child using the Stanford-Binet Form L-M (S-B) or the Slosson Intelligence Test for Children and Adults (SIT).

One hundred pre- postdata cards were compiled as children were staffed in and phased out over a two-year period from 1974 to 1976. Subtest raw and quotient scores as well as interval ages were recorded for the MBDP and the A-B; chronological age and IQ were recorded for the SIT and the S-B. A copy of the pre- postdata card is found in Appendix C.

To collect data regarding the mothers' perception of control (internal-external) a packet with a cover letter was mailed to 100 parents of project children with complete pre- postdata cards requesting participation in an opinion survey regarding "current issues." A copy of the cover letter is found in Appendix D. Enclosed in the packet were a set of instructions for filling out the I-E scale and a copy of Rotter's I-E scale (see Appendix A). Follow-up phone calls were made inquiring whether the

materials had been received, and 80 respondents returned complete I-E scales which were used for the study.

### Treatment of Data

The raw data were punched on IBM cards and computer analyzed using the Statistical Package for the Social Sciences Program by Nie, et al. (1975). The first 7 major hypotheses were analyzed using the Pearson Product-moment correlation coefficient to determine if any relationship existed between the mother/teacher locus of control (LOC) variable and developmental/intellectual child change. The correlation study was also conducted to ascertain whether any relationship existed between child change and demographic variables independent of the mother/teacher LOC category.

Hypotheses 8 through 12 were analyzed using the student's  $t$  test to examine group mean attitudes of teachers about locus of control and whether there was any evident effect on preschool handicapped developmental/intellectual child change. Differences were accepted as significant if they reached the .05 level of significance. Since these data were neither correlated nor matched, the  $F$  test was used to test for equal variances to determine whether to use the pooled  $t$ -test formula (equal variance) or the separate  $t$ -test formula (nonequal variance).

Hypotheses 15 through 17 were assessed using the one-way analysis of variance to examine whether the mother's degree of locus of control (internal group - middle group - external group) had any effect on preschool handicapped developmental/intellectual child change.

The Scheffé's Test for multiple comparisons was used for mean group comparisons. The Scheffé method is more rigorous than other multiple comparison methods with regard to type I error; i.e., the probability of rejecting the null hypothesis when it is true. It leads to fewer significant differences. The values of  $\underline{F}$  and  $\underline{F}'$  where  $\underline{F}' = (k - 1)\underline{F}$  were compared to determine significant mean differences at the .05 level of confidence.

Hypotheses 18 through 20 were assessed using a Multiple Regression equation in an attempt to ascertain whether the independent variables; i.e., pretest age, pretest IQ, sex, parent, and teacher internal/external locus of control would combine their predictive value to improve the prediction of the dependent variable.

## THE FINDINGS

This investigation attempted to discover the effects that a specific mother and/or teacher attitude about personal mastery or effectiveness in coping with life tasks (internal-external locus of control) might have on a preschool handicapped child's intellectual and developmental progress. Relationships were also explored between child change and several demographic variables; i.e., gender, intelligence, and posttest age, independent of the mother/teacher LOC category. Within group mean attitudes (internal-external locus of control) of teachers were examined relative to a preschool handicapped child's intellectual and developmental progress. Degree of mother locus of control, i.e., internal group, middle group, or external group, and influence on the dependent variable was investigated; and finally the possibility was explored that several variables in combination contributed more to child change than any single predictor variable.

Of secondary concern to this study was whether the results of any components of the criterion instruments measuring child change were individually influenced by mother/teacher attitude about personal control.

Twenty hypotheses were developed from the stated problem. Twelve subnull hypotheses were generated as secondary concerns emerged. In abbreviated form, the findings may be found in Appendix E.

To illustrate the findings relevant to each null hypothesis, textual and tabular data of the analysis of results will be presented. A significance at or beyond the .05 level of confidence was necessary for rejection of a null hypothesis.

## Results of the Statistical Analyses

Treatment I: Report of correlations

In order to ascertain if there were any relationships between the independent variables, i.e., parent locus of control and teacher locus of control, and the dependent measures; i.e., preschool handicapped child developmental and intellectual change, correlations were computed for the two classes of variables. The selected variables gender, intelligence, and age, independent of the mother/teacher LOC category, were also correlated with child change. The findings for treatment I are summarized in Table 1.

Hypothesis 1: There is no significant relationship between mother locus of control and developmental change as measured using:  
a. The Marshalltown Behavioral Developmental Profile  
b. The Alpern-Boll Developmental Profile

The relationship between locus of control and developmental change as measured by either the Marshalltown Behavioral Developmental Profile and the Alpern-Boll Developmental Profile was not significant at the .05 level. Thus, null hypotheses 1a and 1b were not rejected.

Hypothesis 2: There is no significant relationship between teacher locus of control and developmental change as measured using:  
a. The Marshalltown Behavioral Developmental Profile  
b. The Alpern-Boll Developmental Profile

The relationship between teacher locus of control and developmental change as measured by the Marshalltown Behavioral Developmental Profile was significant at the .05 level. The Pearson  $r$  was positive which indicated teacher attitude about personal control was significantly related to child developmental change as reflected by the MBDP. Thus, null hypothesis 2a was rejected.

Table 1. Pearson correlation coefficient,  $n$ , level of significance, and hypothesis

		(MDIFDQ) Marshalltown Developmental Quotient: Post Pre difference	(ABDIFDQ) Alpern-Boll Developmental Quotient: Post Pre difference	(IQDIF) Intellectual Quotient: Post Pre difference
Parent internal-external locus of control	$r$	-.0273	.0284	.0196
	$n$	80	80	80
	$p$	.405	.401	.431
	$H_0$	1a	1b	3
Teacher internal-external locus of control	$r$	.3360	.1488	.0672
	$n$	72	72	72
	$p$	.002**	.106	.287
	$H_0$	2a	2b	4
Sex	$r$	.0639	-.0833	
	$n$	80	80	
	$p$	.287	.231	
	$H_0$	5a	5b	
Intellectual quotient post- pre-difference	$r$	.1704	.4270	
	$n$	80	80	
	$p$	.065	.001**	
	$H_0$	6a	6b	
Age at posttest	$r$	-.3066	.0234	
	$n$	80	80	
	$p$	.003**	.418	
	$H_0$	7a	7b	

\*\* $p < .01$ .

The relationship between teacher locus of control and developmental change as measured by the Alpern-Boll Developmental Profile was not found to be significant at the .05 level. Null hypothesis 2b, utilizing the Alpern-Boll Developmental Profile, was not rejected.

Hypothesis 3. There is no significant relationship between mother locus of control and intellectual change as assessed using a standardized intelligence test.

There was insufficient evidence to reject null hypothesis 3. Mother locus of control was not significantly correlated with intellectual change nor pre or postmeasures of intelligence. There were only 3.3 mean points difference between pre and posttest IQ measures, so it might be expected that similar correlations would occur between mother LOC and pretest IQ, posttest IQ, and change IQ scores.

Hypothesis 4. There is no significant relationship between teacher locus of control and intellectual change as assessed using a standardized intelligence test.

As with hypothesis 3, there were no significant correlations between teacher locus of control and IQ change. Once again, correlations across IQ pre, posttest, and change scores were similarly low, ranging from .29 to .37. Hypothesis 4 failed to be rejected.

Hypothesis 5. There is no significant relationship between sex and developmental change as measured using:  
a. The Marshalltown Behavioral Developmental Profile  
b. The Alpern-Boll Developmental Profile

Gender did not appear to play an important role in developmental change, as the  $r$  was not significant at the .05 level using either the MBDP or the A-B. The null hypothesis was not rejected for either 5a or 5b.

- Hypothesis 6. There is no significant relationship between intelligence (at posttest) and developmental change as measured using:
- a. The Marshalltown Behavioral Developmental Profile
  - b. The Alpern-Boll Developmental Profile

The relationship between intelligence and developmental change as measured by the Marshalltown Behavioral Developmental Profile was not significant at the .05 level. Null hypothesis 6a failed to be rejected.

The relationship between intelligence and developmental change as measured by the Alpern-Boll was significant at the .05 level resulting in the rejection of hypothesis 6b. The Pearson  $r$  was positive which indicates respondent survey change data paralleled IQ change data.

- Hypothesis 7. There is no significant relationship between age (at post-test) and developmental change as measured by:
- a. The Marshalltown Behavioral Developmental Profile
  - b. The Alpern-Boll Developmental Profile

The relationship between posttest age and developmental change as measured by the Marshalltown Behavioral Developmental Profile was significant at the .05 level; hence, null hypothesis 7a was rejected. The Pearson  $r$  was negative which suggests that, as the preschool handicapped child grows older, developmental growth occurs less rapidly.

The relationship between posttest age and developmental change as measured by the Alpern-Boll Developmental Profile was not significant at the .05 level. Consequently, null hypothesis 7b was not rejected.

#### Treatment II: Report of t-tests

Each of the following hypotheses were assessed using  $t$ -tests. The  $t$ -test method was chosen because of its robust nature. It has been found empirically that even if certain assumptions underlying the  $t$ -test are violated, e.g., symmetrical distribution of scores, random sampling, small

sample size, etc., the t-test will in most instances still provide an accurate estimate of the significance level for differences between sample means (Borg & Gall, 1974).

Hypothesis 8. There is no significant difference in amount of developmental change as assessed using the Marshalltown Behavioral Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.

Null hypothesis 8 was rejected. The observed value of t was well above the value required for significance at the .01 level. These results are presented in Table 2. A prelude to this finding was established in hypothesis 2a when a significant correlation was found between teacher locus of control and developmental change as measured by the MBDP. The present findings serve to corroborate earlier speculation that there is a significant difference in the relationship between teachers with an internal locus of control orientation and teachers with an external orientation regarding preschool handicapped child developmental change.

Hypothesis 8a. There is no significant difference in amount of communication change as assessed using the Marshalltown Behavioral Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.

Hypothesis 8a was rejected. The observed value of t (-2.91) was larger than required and the difference between means was significant. The results are displayed in Table 2.

Hypothesis 8b. There is no significant difference in amount of motor change as assessed using the Marshalltown Behavioral Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.

Table 2. Posttest-pretest child developmental change difference as assessed by the MBDP when sorting on teacher locus of control (internal-external)

Variable (MBDP)	Teacher I-E	Standard deviation	Mean difference	t value	Probability
Total DQ Ho8	I E	13.264 13.019	9.1148 22.0909	-2.99**	.004
Communication Ho8a	I E	8.800 8.888	13.5902 22.0000	-2.91**	.005
Motor Ho8b	I E	6.695 6.789	13.8197 23.0909	-4.22***	.000
Social Ho8c	I E	6.620 6.964	10.9016 18.0909	-3.29**	.002

\*\* $p < .01$ .

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

Hypothesis 8b was also rejected. The observed value of  $t$  (-4.22) was well above the value required for significance at the .001 level and the difference between means was significant. These results are depicted in Table 2.

Hypothesis 8c. There is no significant difference in amount of social change as assessed using the Marshalltown Behavioral Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.

Hypothesis 8c is rejected. The observed value of  $t$  (-3.29) was greater than required, and the difference between means was significant. The analysis of these results is displayed in Table 2. All three null sub-hypotheses relating to the subcategories of communication, motor, and social development within the Marshalltown Behavioral Developmental

Profile were rejected. All  $t$  values were significant at the .01 level. These results indicate that the relationship which exists between teacher locus of control and child development holds not only for the total development score but nearly equivalently across all three subtests of the MBDP instrument.

Hypothesis 9. There is no significant difference in amount of developmental change as assessed using the Alpern-Boll Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.

There was insufficient evidence to reject null hypothesis 9. These results are presented in Table 3. Due to the relatively stable, unchanging characteristics of attitude (Borg & Gall, 1974) it appears that pretest mother appraisal of child status did not undergo any large change by posttest. Expectancies for the outcomes of behaviors are learned, and they depend upon the degree of success or failure that they have met in the past (Phares, 1976). If expectancies have not been successfully reinforced in the past, there tends to be less commitment to new tasks thereby lowering the probability for success, and a pattern for an external locus of control orientation is established. The mean locus of control for parents was slightly more external than the mean locus of control for teachers. Since it is unlikely the teachers would have affected any significant attitude change in parents simply through modeling, it would be expected that the slightly more externally oriented parents, as a group, would not expect and therefore not see as much child change as teachers. If this be the case, then measures of child change using the

Table 3. Posttest-pretest child developmental change difference as assessed by the A-B when sorting on teacher locus of control (internal-external)

Variable (A-B)	Teacher I-E	Standard deviation	Mean difference	$t$ value	Probability
Total DQ	I	16.073	6.7377	.01	.992
Ho 9	E	33.164	6.6364		
Communication	I	9.436	10.6557	.70	.486
Ho 9a	E	12.769	8.3636		
Motor	I	9.623	12.6230	-1.14	.277
Ho 9b	E	17.234	18.7273		
Social	I	12.190	14.2623	-.02	.981
Ho 9c	E	16.633	14.3636		

A-B survey instrument would depend upon mother locus of control more than teacher locus of control.

Hypothesis 9a. There is no significant difference in amount of communication change as assessed using the Alpern-Boll Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.

There was insufficient evidence to reject null hypothesis 9a. The observed value of  $t$  (.01) was less than the magnitude required, and the difference between means was not significant. These results are displayed in Table 3.

Hypothesis 9b. There is no significant difference in amount of motor change as assessed using the Alpern-Boll Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.

The analysis of these data failed to result in the rejection of Hypothesis 9b. These results are shown in Table 3.

Hypothesis 9c. There is no significant difference in amount of social change as assessed using the Alpern-Boll Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.

There was insufficient evidence to reject null hypothesis 9c. These results are exhibited in Table 3. All three subhypotheses relating to the subcategories of communication, motor, and social development within the Alpern-Boll Developmental Profile failed to be rejected. As with the MBDP, it appears that the total score is rather reliably represented by each subcategory contributing to the composite A-B developmental score.

The following two hypotheses were checked by converting raw score data, i.e., developmental quotient scores derived from both the Marshalltown Behavioral Developmental Profile and the Alpern-Boll Developmental Profile, into standard scores and then making  $t$  test comparisons for mean change.

It is generally not possible to evaluate raw scores from different tests because of the difficulty in comparing average level of scores obtained between tests as well as variation among the scores (Armour, 1966). A widely used method for evaluating scores between tests is to transform the scores to standard units. Then, the means and standard deviations are made to equal predetermined values, e.g., a mean of zero and a standard deviation of one ( $z$  score). This permits comparison between tests because of a common unit of measurement.

The developmental quotient scores for both the MBDP and the A-B were converted to standard scores in order to make relative comparisons between two essentially different tests. Since negative as well as positive

scores occur when using z scores the standard score selected was the T score with a mean of 50 and a standard deviation of 10.

Hypothesis 10. There is no significant difference between pretest Marshalltown Behavioral Developmental Profile quotient scores and Alpern-Boll Developmental Profile quotient scores when sorting on teacher locus of control.

There was insufficient evidence to reject null hypothesis 10. These results are presented in Table 4. One reason for this finding may be that attitude and inadvertent bias, if any, held reasonably consistently for both teacher groups. The same teacher would survey the mother and observe the child. If scores were influenced in any way, it would probably have been as a function of attitude; i.e., expectation for results. This same phenomenon would likely have been operating for either teacher group thereby diminishing the probability of any significant discrepancy between MBDP and A-B pretest quotient scores.

Hypothesis 11. There is no significant difference between posttest Marshalltown Behavioral Developmental Profile quotient scores and Alpern-Boll Developmental Profile quotient scores when sorting on teacher locus of control.

There was insufficient evidence to reject null hypothesis 11. The results are displayed in Table 4. It would appear that the variables influencing pretest quotient scores were also operating for posttest comparisons between the MBDP and A-B.

Hypothesis 12. There is no significant difference in amount of intellectual change as assessed using a standardized intelligence test between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.

There was insufficient evidence to reject null hypothesis 12. These results are shown in Table 5. The IQ mean change (3.3 points) was

Table 4. Pretest MBDP, A-B mean DQ difference and posttest MBDP, A-B mean DQ difference when sorting on teacher locus of control (internal-external)

Variable	Teacher I-E	Standard deviation	Mean T score	Mean difference	t value	Probability
MBDP, A-B pretest	I (MBDP)	21.526	49.174	.733	.166	.932
	I (A-B)	26.873	48.441			
Ho 10	E (MBDP)	15.834	49.945	.163	.021	.929
	E (A-B)	21.366	49.782			
MBDP, A-B posttest	I (MBDP)	25.992	50.036	.729	.140	.961
	I (A-B)	28.404	49.307			
Ho 11	E (MBDP)	10.611	45.445	4.545	.651	.999
	E (A-B)	19.585	49.990			

Table 5. Posttest-pretest mean IQ difference when sorting on teacher locus of control (internal-external)

Variable	Teacher I-E	Standard deviation	Mean difference	t value	Probability
IQ Ho 12	I	27.052	4.0492	-.62	.542
	E	12.993	7.2727		

sufficiently small to suggest a restricted range of change scores. This condition would lessen the possibility that either teacher group (internal or external) could demonstrate any significant contribution (relationship) to change.

#### Treatment III: Report of one-way analyses of variance

Mother degree of locus of control (internal group-middle group-external group) was investigated to determine whether there was any effect on preschool handicapped developmental/intellectual child change.

Hypothesis 13. There is no significant difference in amount of developmental change as assessed using the Marshalltown Behavioral Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group.

There was insufficient evidence to reject hypothesis 13. The results are presented in Table 6. It appears that, regardless of degree of locus of control, there is no significant relationship between mother locus of control and developmental change as measured by the MBDP. These results were presaged by hypothesis 1, when a nonsignificant correlation was found between mother locus of control (mean) and developmental change as measured by either the MBDP or the A-B.

Hypothesis 13a. There is no significant difference in amount of communication change as assessed using the Marshalltown Behavioral Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group.

There was insufficient evidence to reject hypothesis 13a. The observed value of  $F$  (.957) was less than required, and the difference between means was not significant. These results are displayed in Table 6.

Hypothesis 13b. There is no significant difference in amount of motor change as assessed using the Marshalltown Behavioral Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group.

The analysis of these data failed to result in the rejection of hypothesis 13b. The results are shown in Table 6.

Table 6. Posttest-pretest child developmental change difference as assessed by the MBDP when sorting on mother degree of locus of control (internal, middle, external)

Variable (MBDP)	Mother I-E	Standard deviation	Mean difference	F value	Probability
Total DQ	I	13.4925	11.7667	.652	.524
Ho 13	M	14.5557	8.2917		
	E	12.7026	13.3462		
Communication	I	9.0437	14.7333	.957	.389
Ho 13a	M	10.0714	13.7083		
	E	7.4615	17.0769		
Motor	I	7.2512	15.8000	.795	.455
Ho 13b	M	6.7501	13.5417		
	E	7.8041	15.7692		
Social	I	6.9017	11.2333	.780	.462
Ho 13c	M	6.7790	11.2917		
	E	7.3099	13.3462		

Hypothesis 13c. There is no significant difference in amount of social change as assessed using the Marshalltown Behavioral Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group.

There was insufficient evidence to reject hypothesis 13c. The results may be found in Table 6. All three subhypotheses relating to the subcategories of communication, motor, and social development within the Marshalltown Behavioral Developmental Profile failed to be rejected. A confounding variable may have been the uncontrolled for pairing of internally oriented-externally oriented parent/teacher teams where one orientation would tend to cancel or diminish the effects of the other.

Hypothesis 14. There is no significant difference in amount of developmental change as assessed using the Alpern-Boll Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group and children whose mothers are in the external locus of control group.

The results of these data analyses failed to yield an  $F$  value of the magnitude necessary for rejection of null hypothesis 14. These results are presented in Table 7. No combination of degree of mother locus of control and developmental change as measured with the A-B resulted in significance at the .05 level.

Hypothesis 14a. There is no significant difference in amount of communication change as assessed using the Alpern-Boll Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group.

The observed value of  $F$  (1.277) was less than required, and the mean difference between means was not significant. These results are displayed in Table 7.

Hypothesis 14b. There is no significant difference in amount of motor change as assessed using the Alpern-Boll Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group and children whose mothers are in the external locus of control group.

The analysis of these data failed to result in the rejection of hypothesis 14b. The results are shown in Table 7.

Hypothesis 14c. There is no significant difference in amount of social change as assessed using the Alpern-Boll Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group and children whose mothers are in the external locus of control group.

Table 7. Posttest-pretest child developmental change difference as assessed by the A-B when sorting on mother locus of control (internal, middle, external)

Variable (A-B)	Mother (I-M-E)	Standard deviation	Mean difference	F value	Probability
Total DQ Ho 14	I	10.8308	5.7333	.000	.999
	M	21.0485	5.7917		
	E	25.8898	5.7308		
Communication Ho 14a	I	8.2158	10.8667	1.277	.285
	M	9.2861	12.1667		
	E	10.9836	8.0000		
Motor Ho 14b	I	11.2885	13.8667	.226	.798
	M	11.0411	12.0833		
	E	12.2309	14.0769		
Social Ho 14c	I	8.7017	15.2667	.284	.754
	M	11.8786	13.6667		
	E	17.2783	12.6923		

There was insufficient evidence to reject hypothesis 14c. The results may be found in Table 7.

The same results, as with the Marshalltown Behavioral Developmental Profile, held for the three subhypotheses relating to the subcategories of communication, motor, and social development within the Alpern-Boll Developmental Profile. Explanations for the failure to reject hypothesis 13 also apply to the failure to reject hypothesis 14.

Hypothesis 15. There is no significant difference in amount of intellectual change as assessed using a standard intelligence test between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group.

There was insufficient evidence to reject hypothesis 15. There was no significant relationship between any of the mother locus of control levels and intellectual change. Since none of the groups differed significantly from any other group, i.e., the ratio of between-groups variance to within-groups variance failed to yield a significant  $F$ , it was to be expected that the Scheffé test for multiple mean comparison would not reach statistical significance. In group 1, the mother internal locus of control mean difference score was 2.37; in group 2, the mother middle locus of control mean difference score was 4.67; and in group 3, the mother external locus of control mean difference score was 3.08. These results are presented in Table 8.

Hypothesis 16. There is no significant difference between pretest Marshalltown Behavioral Developmental Profile quotient scores and Alpern-Boll Developmental Profile quotient scores when sorting on mother locus of control.

Analysis of these data gathered to test null hypothesis 16 failed to result in the rejection of the hypothesis. The DQ difference scores were converted to standard scores in order to make relative comparisons between two essentially different tests. These results are displayed in Table 9.

Hypothesis 17. There is no significant difference between posttest Marshalltown Behavioral Developmental Profile quotient scores and Alpern-Boll Developmental Profile quotient scores when sorting on mother locus of control.

There was insufficient evidence to reject hypothesis 17. No combination of mother degree of locus of control and posttest difference between MBDP and A-B quotient scores was significant at the .05 level. Once again, the DQ difference scores were converted to standard scores for legitimate comparisons. These results may be found in Table 9.

Table 8. Posttest-pretest IQ mean difference when sorting on mother locus of control (internal, middle, external)

Variable	Mother I-M-E	Standard deviation	Mean difference	F value	Probability
IQ Ho 15	I	22.6007	2.3667	.052	.950
	M	24.8485	4.6667		
	E	31.6087	3.0769		

Table 9. Pretest MBDP, A-B mean DQ difference and posttest MBDP, A-B mean DQ difference when sorting on mother locus of control (internal, middle, external)

Variable	Mother I-M-E	Standard deviation	Mean T score	Mean difference	t value	Probability	
MBDP, A-B pretest Ho 16	I (MBDP)	18.4	49.787	.060	.010	.938	
	I (A-B)	25.5	49.847				
	M (MBDP)	M (A-B)	23.1	50.150	.100	.013	.907
		M (A-B)	28.2	50.050			
	E (MBDP)	E (A-B)	20.3	48.300	1.438	.255	.788
		E (A-B)	20.5	49.738			
MBDP, A-B posttest Ho 17	I (MBDP)	25.1	50.147	3.354	.510	.978	
	I (A-B)	26.1	46.793				
	M (MBDP)	M (A-B)	27.1	49.871	.104	.013	.902
		M (A-B)	30.6	49.975			
	E (MBDP)	E (A-B)	18.0	49.800	.172	.030	.829
		E (A-B)	22.8	49.972			

Treatment IV: Report of multiple regression

Multiple regression was utilized to explore the possibility that several independent variables would combine their predictive value in order to improve the prediction of the dependent variable.

Hypothesis 18. There is no significant relationship between developmental change as assessed using the Marshalltown Behavioral Developmental Profile and the following single or combined variables.

- (a) PIE (mother internal-external locus of control)
- (b) TIE (teacher internal-external locus of control)
- (c) sex
- (d) pretest IQ
- (e) pretest age

The observed values of  $F$  for teacher locus of control, pretest age and pretest IQ were well above the value required for significance. Thus, hypotheses 18b, 18d, and 18e were rejected. The three variables together correlate .54 with the criterion. Common variance shared is .289, which is almost the total variance using all five predictors. The additional influence of the variables sex and parent locus of control was negligible, increasing correlations by only .008 and the common variance by .009. Hypothesis 18a and 18c failed to be rejected. Significant correlations previously reported between developmental change, as measured by the MBDP, and posttest age and IQ scores appear to hold equally for pretest age and IQ scores. The other predictor variables also appear essentially to reflect previous findings. Teacher locus of control was found to correlate significantly with the criterion variable, whereas parent locus of control and sex did not. The  $F$  values resulting from these analyses of multiple regression appear in Appendix F, Table 10.

Hypothesis 19. There is no significant relationship between developmental change as assessed using the Alpern-Boll Developmental Profile and the following single or combined variables:

- (a) PIE
- (b) TIE
- (c) sex
- (d) pretest IQ
- (e) pretest age

The observed value of  $F$  for teacher locus of control was slightly higher than the required cut-off, so hypothesis 19b was conservatively rejected. Results of data analyses relating to the remaining predictor variables, i.e., PIE, sex, pretest age, and pretest IQ, failed to yield an  $F$  of significant value to reject hypotheses 19a, 19c, 19d, and 19e. Previous measures within this study generally support these findings with the exception that teacher locus of control has not been significantly related to the criterion. The  $F$  values resulting from these analyses of multiple regression appear in Appendix F, Table 11.

Hypothesis 20. There is no significant relationship between intellectual change as assessed using a standardized intelligence test and the following single or combined variables:

- (a) PIE
- (b) TIE
- (c) sex
- (d) pretest IQ
- (e) pretest age

There was insufficient evidence to reject hypothesis 20a, 20b, 20c, 20d, and 20e. Results are presented in Appendix F, Table 12.

### Summary

In summary, the findings of this study concerning the effects of mother/teacher attitudes about the ability to control or influence change in the personal environment related to preschool handicapped child growth

have been presented. Mother locus of control, as assessed by the Rotter Internal-External Scale, was examined correlationally with developmental and intellectual change. Neither variable was significantly related to mother locus of control. Developmental and intellectual change were also correlated with teacher locus of control. The correlation between teacher locus of control and developmental change as measured by the MBDP was significant at the .05 level. It is interesting to note that significant relationships occurred using the teacher observational measure (Marshalltown Behavioral Developmental Profile) rather than with the mother survey measure (Alpern-Boll Developmental Profile). No significant relationship was apparent when correlating teacher locus of control and mother locus of control with IQ.

Correlations were also calculated between intellectual and developmental change, sex and developmental change, and posttest age and developmental change. The relationship between intellectual and developmental change as measured by the mother survey measure (A-B) was significant at the .01 level. No significant relationship was observed between sex and developmental change. The relationship between posttest age and developmental change, as measured by the teacher observational measure (MBDP), was significant at the .05 level.

Within-group attitudes of teachers were assessed using the Rotter I-E Scale. Variables analyzed were developmental and intellectual change. The major null and all subhypotheses relating to observed developmental change (MBDP) were statistically significant, while the major null and all subhypotheses relating to surveyed developmental change (A-B) failed to

yield a change that was statistically significant. Pre- and posttest MBDP and A-B developmental quotient (DQ) differences were investigated relative to teacher internal-external locus of control. No statistically significant difference was detected. Also a pre-postchange in intelligence was recorded relative to teacher internal-external locus of control, and again, no statistically significant difference was shown.

Degree of mother locus of control was assessed using the Rotter I-E Scale. To assess developmental change, the Marshalltown Behavioral Developmental Profile was used as an observational measure, and the Alpern-Boll Developmental Profile was used as a survey measure. Variables analyzed were developmental quotients, communication change, motor change, and social change. Neither major null hypotheses nor any of the sub-hypotheses yielded a change that was statistically significant. To assess intellectual change a standardized intelligence instrument was used. There was insufficient evidence to reject the hypothesis that there is no significant intellectual change as related to the degree of mother locus of control. Pre- and posttest developmental quotient differences between the MBDP and A-B were converted to standard scores and compared to degree of mother locus of control. Neither the pretest nor the posttest MBDP and A-B mean developmental quotient differences were found to be statistically significant when sorted on the mother locus of control.

The possibility was explored that several independent variables could combine their predictive value in order to improve the prediction of the dependent variables. Variables analyzed were mother internal-external locus of control, teacher internal-external locus of control, sex, pretest

IQ, and pretest age. The combination of teacher internal-external locus of control, pretest age, and pretest IQ appeared to be significantly related ( $p < .01$ ) to the dependent variable, developmental change, as measured by the Marshalltown Behavioral Developmental Profile. These three variables accounted for nearly all the common variance ( $R^2$ ). Only teacher internal-external locus of control reached significance as a contributing variable when compared to surveyed developmental change ( $p < .05$ ). No single or combined variables contributed in a statistically significant way to intellectual change.

## SUMMARY, DISCUSSION AND RECOMMENDATIONS

In this chapter the parameters of the study will be summarized followed by an examination of the major questions posed in Chapter 1. Each major question will be reviewed considering the relationship and/or effect that (a) mothers' attitudes (locus of control) have on preschool handicapped child achievement, (b) teachers' attitudes (locus of control) have on preschool handicapped child achievement, and (c) the combination of mother and teacher attitudes (locus of control) have on preschool handicapped child achievement. Discussion including implications and limitations of the study will be presented, and recommendations for future investigation will complete the chapter.

## Summary

Parameters

The purpose of the study was to examine the possible effects of mother and teacher locus of control on the developmental and intellectual progress made by preschool handicapped children in a prescriptive, intervention program.

The study involved 80 preschool handicapped children, their mothers and 15 home teachers employed by the Marshalltown Project, a preschool division of Area Education Agency 6.

The home teachers served the project families trying to facilitate child developmental growth. Children ranged in age from six months to six years with significant variation in degree and kind of handicap.

Statistical data for evaluating the study were gathered from survey and observational developmental profiles, i.e., the Alpern-Boll Developmental Profile (A-B) and the Marshalltown Behavioral Developmental Profile (MBDP). Data utilized to assess intellectual status and change were obtained from the Stanford-Binet Intelligence Scale Form L-M (S-B) and the Slosson Intelligence Test for Children and Adults (SIT). Mother/teacher attitude (perception of control over outcomes) was assessed by the Rotter Internal-External Control Scale (I-E).

Statistical procedures used were (a) the Pearson product-moment correlation coefficient to explore the relationship between mother/teacher locus of control and developmental/intellectual child change; (b) a  $t$  test difference in mean response to examine whether teacher attitudes about locus of control had any effect on developmental/intellectual child change; (c) one-way analyses of variance to investigate whether there was any significant difference in child change when sorting on mother locus of control; and (d) multiple regression to determine whether any combinations of the variables mother locus of control, teacher locus of control, sex, pretest IQ, and pretest age would improve the prediction of the dependent variable.

Twenty general null hypotheses were formulated to ascertain if mother/teacher locus of control had an effect on or was related to the developmental and intellectual progress made by preschool handicapped children in a prescriptive remedial program. For the purpose of this investigation, these general hypotheses were expanded to include twelve

sub-null hypotheses. All null hypotheses and findings are summarized in Appendix E.

### Mother locus of control

Seven major and six subnull hypotheses were formulated to determine the relationship between mother locus of control (LOC) and developmental and intellectual change in preschool handicapped children.

No significant correlation was found to exist between mother locus of control and child developmental change as assessed using either a mother survey measure (the Alpern-Boll Developmental Profile) or a teacher observational measure (the Marshalltown Behavioral Developmental Profile).

Locus of control responses were divided into categories (internal group-middle group-external group) to investigate the possibility that degree of internality-externality might have an impact on preschool handicapped child change. Again, no significant relationship was found to exist between mother LOC and child developmental change as measured by either the MBDP or the A-B.

Pretest developmental quotient score differences between the MBDP and the A-B and posttest developmental quotient score differences between the MBDP and the A-B were also compared to degree of mother locus of control. The raw scores from each instrument were first converted to standard scores before any attempt was made to assess any difference between the two instruments and the relationship to locus of control. It was originally thought that a significant disparity would exist between pretest MBDP and A-B scores with little difference demonstrated at posttest. Teachers were thought to be more objective because of training whereas

mothers were thought to be more subjective and thus susceptible to distortion in appraisal. Even though mother and teacher initial appraisals may have been disparate or significantly divergent because of different expectations, it was felt that after being involved in prescriptive teaching and observation that both mother and teacher appraisal (especially mother) would become more objective and convergent. Therefore, little difference between mother and teacher appraisal was expected at posttest. However, no combination of mother locus of control and either pretest or posttest MBDP, A-B quotient score differences was significant.

As with developmental change, no significant correlation was found to exist between mother locus of control and child intellectual change.

It appears, then, that regardless of whether the mother was surveyed for appraisal of child status prior to intervention or after involvement as a teacher of her own child, attitude about personal control did not significantly correlate with child developmental or intellectual change.

#### Teacher locus of control

Seven major and six sub-null hypotheses were formulated to determine the relationship between teacher locus of control (LOC) and developmental and intellectual change in preschool handicapped children.

The relationship between teacher locus of control and developmental change as measured by the Marshalltown Behavioral Developmental Profile was significant at the .05 level of confidence. The Pearson correlation coefficient was positive which indicated that teacher attitude about personal control was related to developmental change as reflected by the MBDP. No significant correlation was found to exist between teacher locus

of control and developmental change as measured by the mother survey instrument (Alpern-Boll Developmental Profile).

Teacher locus of control responses were separated into internal versus external groups in an attempt to ascertain whether there was any significant difference in child change developmental scores between the two groups. Teacher internal locus of control results differed significantly from teacher external locus of control results when compared to child developmental change measured by the MBDP. These data were not duplicated when the A-B was used to measure child change.

The MBDP child change mean scores for each teacher group were compared for magnitude and the external group demonstrated the greatest change. This finding was not supported in the literature review in Chapter 2, which tended to support an assumption that internally scoring teachers would have "naturally" effected more change than those with an external orientation. The disparity between the number of scores and the number of teachers generating scores, however, may have influenced these results. Three teachers generated 11 external scores whereas 12 teachers generated 61 internal scores. In contrast, 80 mothers generated 80 scores. There is little doubt that a larger possibility for skewedness exists with the lower teacher n than with the mother group.

In summary, child developmental change, as measured by the Marshalltown Behavioral Developmental Profile appeared to have been influenced more by those teachers with an external locus of control than teachers

with an internal LOC. The finding and the interpretation drawn in this study is limited by the small number of teachers involved.

#### Mother/teacher locus of control

Three major hypotheses were formulated to determine (1) the relationship between teacher locus of control and (a) child developmental change and (b) child intellectual change and (2) mother locus of control and (a) child developmental change and (b) child intellectual change. The independent variables of child sex, child pretest IQ, and child pretest age were also checked for significance. Although three hypotheses were deliberately formulated to explore predictor variables in combination, mother and teacher LOC was inherently part of every interaction.

When teacher LOC was combined with four other independent variables, mother LOC, sex, pretest IQ, and pretest age in an attempt to improve the prediction of the dependent variable, developmental change, teacher LOC combined with pretest age and pretest IQ comprised 97% of the variance measured. Although the  $R$  of .54544 did not permit highly accurate prediction, it indicated that the combined predictor battery had about 30% common variance ( $R^2$ ) with developmental change, as measured by the Marshalltown Behavioral Developmental Profile, while the best single predictor, teacher LOC, had about 11% common variance ( $r^2$ ) with this criterion.

When the dependent variable was assessed using the Alpern-Boll Developmental Profile, only the teacher LOC variable from the predictor battery was significant and shared about two percent common variance ( $r^2$ ) with the criterion. It should be noted, the observed  $F$  for teacher LOC

was only .1 higher than the required cut-off and previous statistical analyses were not supportive of the above results.

Mother LOC was also assessed in combination with the four independent variables, teacher LOC, sex, pretest IQ, and pretest age to investigate the possibility that some combination of these variables might account for a higher percentage of developmental and intellectual child change than any single measure. However, the additional influence of mother LOC was negligible regardless of whether the Marshalltown Behavioral Developmental Profile or the Alpern-Boll Developmental Profile was used to assess developmental change.

In summary, the results corroborated previously reported findings in which there were no significant differences in developmental or intellectual change that were attributable to mother LOC. The findings included, however, significant relationships between teacher locus of control and developmental change (MBDP), and posttest age and developmental change (MBDP). Significant differences were found in pre-posttest difference in developmental change (MBDP) between children whose teachers had an internal LOC and teachers with an external locus of control with the externally oriented teachers apparently affecting the most change.

### Discussion

This study was concerned with the influence parent and teacher locus of control might have on the developmental and intellectual progress made by preschool handicapped children. It was predicted that mother and/or teacher locus of control scores along the I-E continuum would be reflected

in the developmental and intellectual change of preschool handicapped children.

Locus of control was found to be related to developmental child change as measured by the MBDP but the significant relationship between teacher LOC and observed developmental change was not supported by surveyed developmental change (A-B).

One reason for the disparity in correlations between teacher LOC scores and child change results as measured by the Alpern-Boll Developmental Profile (A-B) versus teacher LOC scores and child change results as measured by the Marshalltown Behavioral Developmental Profile (MBDP) may have been the fact that the MBDP was used more specifically as a criterion referenced, hence curricular, instrument than the A-B.

The teacher would tend to have a more precise appraisal of child status through systematic observation than mothers whose prescriptive intervention may not have been perceived as critically related to assessment of child entry or posttest skill levels. Then, regardless of the degree of child change effected, mother appraisal may be somewhat less sensitive to change than teacher appraisal because of the manner in which the measuring instruments were used.

Teachers that have been trained, both formally and/or on-the-job, to assess and teach handicapped youngsters would be susceptible to the belief that their intervention would make a difference and that generally the children they served would progress. Mothers, on the other hand, depending upon the experiences they have had with their children would

likely have their own perceptions about a child's competence and ability to change.

Since the object of this study was not to change attitude, it is doubtful that a teacher expecting change would have had much influence on a mother not expecting change or vice versa. Thus, at the end of an intervention period, appraisal of child change by either group would tend to be a function of mean expectation.

No relationship between any of the mother locus of control levels and intellectual change was found to be significant at the .05 level of confidence. None of the groups differed significantly; i.e., the ratio of between-groups variance to within-group variance failed to yield a significant  $F$ . In Mother LOC group 1 the post-pre IQ mean difference was 2.37; in group 2 the mean difference was 4.67; and in group 3 the mean difference was 3.08.

Other variables which were related in this study to developmental change were age and IQ. Even though locus of control (LOC) was related to developmental change and IQ was related to developmental change, there was no significant relationship between IQ and LOC. The relationship between intelligence and developmental change as measured by the Alpern-Boll Developmental Profile was significant at the .008 level.

The relationship between posttest age and developmental change as measured by the Marshalltown Behavioral Developmental Profile was significant at the .003 level. The Pearson  $r$  was negative which suggests that as the preschool handicapped child grows older, developmental growth occurs less rapidly. Since both age and developmental change were measured in

months, and since mean growth was 10.9 months compared to a mean interval of 11.4 months between pre- and posttesting, there appears to be a cumulative developmental lag, compared to chronological age, which could account for the negative correlation.

Child gender did not appear to have any marked influence on developmental change. These results were somewhat surprising. Even though the handicapping conditions ran the gamut from severe to not so severe, it was still expected that girls would learn social responses earlier and with greater facility than boys (Becker, 1964). The more socialized or socially aware child would seem to be both more receptive and compliant to learning new skills requested in a social context. It might be argued that mothers would be more sensitive to girls because they are generally more responsive to maternal intervention (Moss, 1967). However, data analyzed in this study were not supportive of these previous reports. The correlation between child sex and developmental change as measured by the MBDP was .29 while computation of child sex and the A-B developmental change results yielded a correlation of .23.

Analyses of these data indicated that several variables were contributors to developmental change. Teacher locus of control was significantly related to developmental change as were age and intelligence. However, there was no significant relationship between locus of control and intelligence even though both were related to developmental change.

Locus of control as an independent assessor does not appear to have the singular predictive power that it would have as a contributing variable with other variables.

### Limitations

This study was limited to the preschool handicapped children and their mothers within the geographic boundaries of Area Education Agency 6 (AEA 6) and the home teachers of the Marshalltown Project. Caution must be utilized in generalizing these findings without using other populations for replication.

Limitations in this study were: (1) variable age and corresponding intelligence levels were not investigated even though child change may have been differentially related to any single level or combinations of levels; (2) even though the research consistently supports the position that attitude change is unlikely, a pre-I-E test could have been administered as a check on this unique population to see whether active involvement in prescriptive teaching, indeed, had any effect on locus of control; (3) by relying on the survey method, the researcher was able to obtain a 77% return ( $n = 80$ )--this percentage is usually considered more than adequate, but no attempt was made to ascertain if those not responding might have contributed to sample bias; (4) the small teacher sample ( $n = 15$ ) is less likely than a larger sample to have a mean and standard deviation representative of the population mean and standard deviation; and (5) the researcher is also aware of inherent limitations in looking at gain scores, e.g., regression toward the mean and boundary problems in assessment instruments.

## Implications

Locus of control operates both as a belief directed toward one specific situation and as a generalized expectancy covering many dependent situations. However, when the cues in a particular situation are strong enough most individuals are likely to behave in a similar fashion regardless of their generalized LOC beliefs. When the situation is ambiguous the behavior of individuals is more apt to reflect their generalized LOC beliefs.

The perception of control, however, is but a single expectancy construct and it can be assumed there are other interacting variables which will share the variance in most situations. If the perception of control is to be enhanced, then as a predictor variable, it would seem to be more efficient to design an assessment instrument specifically for a target population.

When only a gross single score in a general internal-external scale is used, predictive efforts become more dependent upon the idiosyncracies and inadequacies of the one I-E scale.

In future attitude/performance studies, instruments designed more specifically for the criterion of interest would probably provide more power in measuring the locus of control construct as one of several predictor variables.

## Recommendations

Many studies have explored aspects of the construct locus of control. Internal-external orientation, or perception of control, has been investi-

gated as a determinant for various social phenomena from resistance to influence to achievement-related behavior.

Research variously supports the contribution of locus of control in accounting for variations in behavior shown in highly structured situations, as a personality variable integral to coping efforts or gaining a measure of control over the environment, as a social characteristic of independence and reliance upon personal judgment, and as a function of the manner in which one reacts to threatening situations (Phares, 1976). Numerous pieces of research appear to be mutually documentative, and rather striking patterns of behavior are emerging. As more documentation occurs, the locus of control concept gains in respect and popularity as an interesting research variable.

However, this writer found a dearth in the research addressing specifically the issue of mother/teacher locus of control and impact on child change as opposed to child locus of control.

Since recent legislation has directed that full educational service be provided to preschool handicapped children and their families, it is believed additional research is needed to illuminate both teaching and learning styles. It is submitted that locus of control, with its foundation in social learning theory, is an organized and logical way to analyze behavior under both structured and nonstructured conditions. Further analyses of mother/teacher-child behaviors and interaction with respect to coping skills, reaction to stress, independence, need for task closure, etc., will encourage more specificity in inservice training planned for upgrading of parent or teaching skills.

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Data gathering for this dissertation was commenced prior to the university requirement approval by a Human Subjects Review Committee. Nonetheless, appropriate safeguards were utilized for protection of the rights of the human subjects used for data gathering purposes.

APPENDIX A: ROTTER I-E SCALE

INSTRUCTIONS FOR THE I-E SCALE

This is a questionnaire to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives lettered a or b. Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you are concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief: obviously there are no right or wrong answers.

In some instances, you may discover that you believe both statements or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you are concerned. Also try to respond to each item independently when making your choice; do not be influenced by your previous choices.

Opinions on Current Issues

INSTRUCTIONS: Below are pairs of statements. Read each pair and indicate with an "X" the statement with which you more readily agree.

1.  Children get into trouble because their parents punish them too much.  
 The trouble with most children nowadays is that their parents are too easy with them.
2.  Many of the unhappy things in people's lives are partly due to bad luck.  
 People's misfortunes result from the mistakes they make.
3.  One of the major reasons why we have wars is because people don't take enough interest in politics.  
 There will always be wars, no matter how hard people try to prevent them.
4.  In the long run, people get the respect they deserve in this world.  
 Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5.  The idea that teachers are unfair to students is nonsense.  
 Most students don't realize the extent to which their grades are influenced by accidental happenings.
6.  Without the right breaks one cannot be an effective leader.  
 Capable people who fail to become leaders have not taken advantage of their opportunities.
7.  No matter how hard you try some people just don't like you.  
 People who can't get others to like them don't understand how to get along with others.
8.  Heredity plays the major role in determining one's personality.  
 It is one's experiences in life which determine what they're like.
9.  I have often found that what is going to happen will happen.  
 Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
10.  In the case of the well prepared student there is rarely if ever such a thing as an unfair test.  
 Many times exam questions tend to be so unrelated to course work that studying is really useless.
11.  Becoming a success is a matter of hard work, luck has little or nothing to do with it.  
 Getting a good job depends mainly on being in the right place at the right time.
12.  The average citizen can have an influence in government decisions.  
 This world is run by the few people in power, and there is not much the little guy can do about it.
13.  When I make plans, I am almost certain that I can make them work.  
 It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
14.  There are certain people who are just no good.  
 There is some good in everybody.

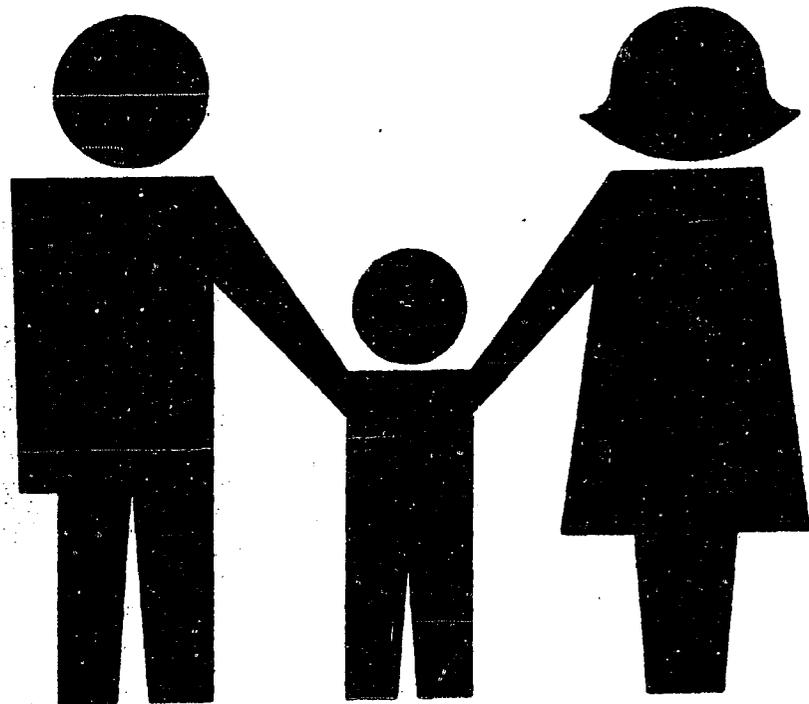
123

Opinions on Current Issues

15.  In my case getting what I want has little or nothing to do with luck.  
 Many times we might just as well decide what to do by flipping a coin.
16.  Who gets to be the boss often depends on who was lucky enough to be in the right place first.  
 Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.
17.  As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.  
 Be taking an active part in political and social affairs the people can control world events.
18.  Most people don't realize the extent to which their lives are controlled by accidental happenings.  
 There really is no such thing as "luck."
19.  One should always be willing to admit mistakes.  
 It is usually best to cover up one's mistakes.
20.  It is hard to know whether or not a person really likes you.  
 How many friends you have depends upon how nice a person you are.
21.  In the long run the bad things that happen to us are balanced by the good one  
 Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
22.  With enough effort we can wipe out political corruption.  
 It is difficult for people to have much control over the things politicians do in office.
23.  Sometimes I can't understand how teachers arrive at the grades they give.  
 There is a direct connection between how hard I study and the grades I get.
24.  A good leader expects people to decide for themselves what they should do.  
 A good leader makes it clear to everybody what their jobs are.
25.  Many times I feel that I have little influence over the things that happen to me.  
 It is impossible for me to believe that chance or luck plays an important role in my life.
26.  People are lonely because they don't try to be friendly.  
 There's not much use in trying too hard to please people, if they like you, they like you.
27.  There is too much emphasis on athletics in high school.  
 Team sports are an excellent way to build character.
28.  What happens to me is my own doing.  
 Sometimes I feel that I don't have enough control over the direction my life is taking.
29.  Most of the time I can't understand why politicians behave the way they do.  
 In the long run the people are responsible for bad government on a national as well as on a local level.

APPENDIX B: MARSHALLTOWN BEHAVIORAL DEVELOPMENTAL PROFILE

**MANUAL I**  
**BEHAVIORAL DEVELOPMENTAL PROFILE**



***THE MARSHALLTOWN PROJECT***

# Parent/Child HOME Stimulation

"THE MARSHALLTOWN PROJECT"

Manual I

BEHAVIORAL DEVELOPMENTAL PROFILE

Department of Special Education  
Area Education Agency 6  
9 Westwood Drive  
Marshalltown, Iowa 50158

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BEHAVIORAL DEVELOPMENTAL PROFILE

MANUAL I

BY: MIKE DONAHUE  
JOHN D. MONTGOMERY  
ARLENE F. KEISER  
VICKY L. ROECKER  
LINDA I. SMITH  
MILFORD F. WALDEN

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P U R P O S E

The Marshalltown Behavioral Developmental Profile was developed for handicapped and culturally deprived children in the 0-6 year range. It is designed to facilitate individualized prescriptive teaching of pre-school children within the home setting.

Since the list of items are based on patterns of "normal" child development, usage need not be restricted to a particular target population. Interventionists in pre-school education will find the material useful for assessment and as a systematic guide for program planning. An individual child's strengths and weaknesses in important abilities can be easily determined and specific educational strategies implemented.

This instrument was researched, initially, in early summer, 1972. With the valued help and assistance of many professional consultants and friends, it has gone through its fifth revision. Originally it seemed a good idea to separate items into diagnostic/assessment and intervention/assessment classifications. However, with use it became all too clear that it would be difficult to determine intervention efficacy, if a number of developmental disabilities were merely recorded in a composite score and no practical strategies for change were available. Also, many earlier items suggested partial successes were acceptable or encouraged. The items are now phrased in such a way as to clearly indicate intent, i.e. the child does or does not have the skill in his repertoire.

The profile composition permits a systematic observation of a variety of behavioral skills. Interpreted skills such as receptive and expressive language, cognitive, fine and gross motor, personal-social, self-help and emotional indices have been collapsed under three categories: Communication, Motor, and Social.

Behavioral items are further grouped into age categories. This particular ploy was not intended to be used for rigid classification, in a comparative sense, but rather considered an evaluative technique to demonstrate individual progress measurable in months.

It would be circular to argue "real" age achievement when the parameters of "normal" development vary so widely. Whether a child was "actually" 2 - 6 when prescriptive teaching began and after a given period of time was "actually" 3 - 2 suggests an attempt to forever equate chronological age with achievement age, often to the child's disadvantage. By comparing intra-individual strengths and weaknesses and measuring progress only in months, no undue emphasis need be placed on assembly line averages. Deviations are more easily understood and accepted.

A main reason for consolidating items under only three categories is the inevitable replication across expanded classifications. There are often, in developmental scales, similar or identical items which appear in cognitive, academic, language, and social categories. The question is, if such items are so difficult to separate, specifically, why continue the expansion circle? For many, the problem has been practically solved by contraction.

#### R A T I O N A L E

The early years are recognized as critical periods in the child's development. He will never, again, pass through such an accelerated learning period nor, for that matter, be so ingenuous as to eagerly anticipate and welcome each new learning experience. Parent awareness of the importance of the first years in preparing a child for future competencies, successes, and self-approval can lead to anxiety about the awesome responsibility of guiding and caring for young

children. The task, however, becomes less appalling as order is introduced and definition of each developmental skill is made more clear.

The prescriptive approach does not limit procedures. Strategies are considered to be, simply, suggestions or alternatives. Since total emphasis is on the individual child and individualized instruction, flexibility must be the theme. Strategies for accomplishing objectives may run the gamut from Rube Goldberg approaches, to a more traditional position.

The Marshalltown Behavioral Developmental Profile is an assessment instrument to monitor growth and provide an organized approach to skill acquisition.

### U S E

This profile is used with a score sheet, in conjunction with Behavioral Prescription Guide (Manuals II<sub>a</sub>, II<sub>b</sub>, II<sub>c</sub>). Each profile item is cross-referenced to incremental behavioral objectives and strategies. The objectives merely reduce large behaviors into sequential steps and the strategies are suggestions for implementing each objective. The score sheet reflects a success level, an emergent skill area, and a cluster of skills the child cannot yet master. In other words, a basal and ceiling are established and only those skills clustered between limits are considered practically amenable to intervention. A sample score sheet and a computation table follow the profile.

Evaluation in each category should start with tasks the child can successfully do. Two age segments should be completed without error by the child to establish a double basal. Evaluation should proceed until the child experiences failure for two consecutive age segments to establish a double ceiling.

The Profile is grouped by one month segments through the first twelve months of age, three month segments from 12 months through 24 months, six month segments from 24 through 36 months and twelve month segments from 36 through 72 months. The value of each item is a function of the number of items in each age segment. Example: at age 18 to 21 months, there are two items in communication; hence, each correct or passed item is worth 1.50 months

$$(2 \text{ items } \left| \begin{array}{l} 1.5 \text{ months} \\ 3 \text{ mos.} \end{array} \right. )$$

In the same age segment motor has 5 items

$$(5 \text{ items } \left| \begin{array}{l} .60 \text{ mos.} \\ 3 \text{ mos.} \end{array} \right. )$$

In social there are 7 items

$$(7 \text{ items } \left| \begin{array}{l} .43 \text{ mos.} \\ 3 \text{ mos.} \end{array} \right. )$$

To arrive at the total age score record the highest age segment, without errors, and add values for each correct item thereafter. The age scores can then be compared across categories for priority considerations.

To eliminate the need for multiplying the number correct by the value attributed to each particular age segment, a computation table is included (page 30.). Values are represented horizontally and the number correct are represented vertically.

C O M M U N I C A T I O N

0-1 Mo.	1.1 Produces vowel sounds (ex: A and E).
1-2 Mo.	1.2 Listens to human voice. 1.3 Produces sounds made in the back of the throat (ex: h, k, g). 1.4 Repeats one syllable in cooing activity (ex: ba-ba-ba).
2-3 Mo.	1.5 Watches speaker's eyes and mouth. 1.6 Vocalizes when talked to.
3-4 Mo.	1.7 Looks and searches for source of voice or sound (ex: turns head).

4-5 Mo.	1.8 Stops crying in response to vocal stimulation.
	1.9 Looks and/or vocalizes in response to own name.
5-6 Mo.	1.10 Four or more different syllables present at once during vocalizations.
6-7 Mo.	1.11 Looks for family members or pets named in conversation.
7-8 Mo.	1.12 Vocalizations consist of sentence like utterances, but no true words present. Repeats combination of two or more sounds.
	1.13 Uses the consonants (d, m, b, z).
	1.14 Looks at some common objects when their names are spoken.
8-9 Mo.	1.15 Responds to "NO" by stopping activity.
	1.16 Interest maintained for up to a full minute while looking at pictures when they are named.
	1.17 Some gesture language used (shakes head for "NO").

9-10 Mo.	<p>1.18 Repeats words other than "mama" or "dada" usually the name of a pet or toy.</p> <p>1.19 Uses some exclamations (oh-oh).</p>
10-11 Mo.	<p>1.20 Follows simple commands like "come here", "give me."</p> <p>1.21 Responds by searching movements/vocalizations to simple questions like, "Where is daddy?"</p>
11-12 Mo.	<p>1.22 Consistent use of three or more words.</p> <p>1.23 Responds verbally to simple requests (says bye-bye).</p>
12-15 Mo.	<p>1.24 Consistent use of seven or more words.</p> <p>1.25 Uses the consonants (w, t, j, n).</p> <p>1.26 Listens to rhymes and jingles (3 minutes).</p> <p>1.27 Identifies pictures of a few named objects or the objects themselves by pointing or vocalizing.</p> <p>1.28 Recognizes names of major body parts.</p>

15-18 Mo.	<p>1.29 Words used rather than gestures to express wants and needs.</p> <p>1.30 Brings a familiar object from another room on request.</p> <p>1.31 Identifies two or more objects from a group of familiar objects.</p>
18-21 Mo.	<p>1.32 Imitates two or three word sentence.</p> <p>1.33 Understands personal pronouns; can distinguish, "Give it to her", "Give it to him."</p>
21-24 Mo.	<p>1.34 Combines words into simple sentences (2-3 words).</p> <p>1.35 Points to four or five parts of a doll, or parts of the body or items of clothing shown in large pictures.</p> <p>1.36 Selects an item from a group of five varied items upon request.</p> <p>1.37 Uses own name in reference to self.</p>
24-30 Mo.	<p>1.38 Uses personal pronouns correctly and refers to self by using a pronoun.</p> <p>1.39 Selects appropriate pictures involving action words (eating, sleeping).</p> <p>1.40 Points to the smaller parts of the body (knees, elbows, wrists).</p> <p>1.41 Identifies objects with their functions (ex: "What do you eat with?").</p> <p>1.42 Associates body parts with their functions (ex: "What do you see with?").</p>

24-30 Mo.  
Continued

- 1.43 Discriminates objects by size (big, little).
- 1.44 Matches geometric form with its symbol.
- 1.45 Selects just one block from a group of blocks in response to, "Give me a block."
- 1.46 Matches colors.
- 1.47 Gives his full name on request.
- 1.48 Repeats two numbers correctly.

30-36 Mo.

- 1.49 Relates meaning to scribbles or drawings when asked
- 1.50 Tells what action is going on in pictures when asked.
- 1.51 Carries out three simple related commands given at once.
- 1.52 Relates two experiences that have happened during the day
- 1.53 Repeats a sentence composed of six or seven syllables.
- 1.54 Names at least one color correctly.
- 1.55 Responds motorically to such verbs as "walk", "run", "climb".
- 1.56 Discriminates by pointing or vocalizing such adjectives as hot, cold, wet.
- 1.57 Tells own gender when asked (boy, girl).
- 1.58 Tells own age when asked.
- 1.59 Discriminates prepositions such as "on", "under", "off".
- 1.60 Adds (s) to words to form plurals.

35-48 Mo.

- 1.61 Carries out four individual commands using prepositions.
- 1.62 Counts three objects, pointing to each.
- 1.63 Identifies circle, square.
- 1.64 Discriminates tactually (rough, smooth, hard, soft).
- 1.65 Spatial relationships; recognizes and joins separate parts into a whole (two halves of a circle).
- 1.66 Recites rhymes or songs from memory.

48-60 Mo.

- 1.67 Aesthetic comparisons; ability to make independent judgments between attractiveness and unattractiveness.
- 1.68 Identifies missing object from a group of three (memory).
- 1.69 Names or points to a penny, nickel, dime upon request.
- 1.70 Identifies or names the three primary colors red, yellow, blue.
- 1.71 Carries out, in order, a command containing three unrelated parts.
- 1.72 Counts and points to ten objects.
- 1.73 Describes objects while naming them using three descriptors (Ex: color, shape, size).
- 1.74 Differentiates morning, afternoon, night.
- 1.75 Compares weight (estimates which is heavy, light).
- 1.76 Relates color to object (Ex: red apple, yellow banana).
- 1.77 Discriminates like and unlike.
- 1.78 Sequences and relates stories or personal experiences, appropriately sequencing four events.
- 1.79 Classifies and organizes objects according to form, color, use.
- 1.80 Asks meaning of words.

48-60 Mo.  
Continued

- 1.81 Demonstrates meaning of words (Ex: pantomime).
- 1.82 Repeats days of week in sequence.

60-72 Mo.

- 1.83 Shifts in classification (classified according to shape then color).
- 1.84 Understands and uses numbers up to 10. Follows command such as, "Give me nine blocks" when twelve are available.
- 1.85 Recites the numbers to thirty.
- 1.86 Repeats a series of four digits correctly in 2/3 trials.
- 1.87 Knows number of fingers on one hand and the total number on both hands.
- 1.88 Knows all basic colors.
- 1.89 Prints name.
- 1.90 Prints numbers 1 through 5.
- 1.91 Time concepts (before, after, now, later, tomorrow).
- 1.92 Identifies preceding and following numbers of digits through ten.
- 1.93 Identifies preceding and following day for specified day of week.

M O T O R

0-1 Mo.	2.1 Follows objects to midline.
1-2 Mo.	2.2 Holds head erect in mid-position when being held. 2.3 Follows moving object with eyes (Ex: mobile).
2-3 Mo.	2.4 Elevates self on forearms. 2.5 Head erect and steady.
3-4 Mo.	2.6 From stomach position, lifts head and shoulders at 90 degree angle, looks around. 2.7 Recovers rattle from his chest. 2.8 Grasps object placed in hand.

4-5 Mo.	<p>2.9 Retains grasp on block held in each hand.</p> <p>2.10 Sits with slight support.</p> <p>2.11 Reaches for objects beyond grasp.</p> <p>2.12 Momentarily supports a large portion of his weight.</p>
5-6 Mo.	<p>2.13 Pulls self up into sitting position.</p> <p>2.14 Bangs with object held in his hand.</p> <p>2.15 Turns from stomach to back, from back to stomach.</p> <p>2.16 Sits erectly in chair.</p> <p>2.17 Transfers object from one hand to the other.</p>
6-7 Mo.	<p>2.18 Sits without support.</p> <p>2.19 Bounces when held in standing position.</p> <p>2.20 Picks up small objects using pincer grasp.</p>
7-8 Mo.	<p>2.21 Makes stepping movements when held.</p> <p>2.22 Stands holding on.</p>

8-9 Mo.	<p>2.23 Grawls (stomach touches floor).</p> <p>2.24 Pulls to standing position.</p> <p>2.25 Removes peg from pegboard.</p>
9-10 Mo.	<p>2.26 Creeps.</p> <p>2.27 Cruises - walks sideways - while holding on to supporting objects with both hands.</p> <p>2.28 Sits down from standing position.</p> <p>2.29 Bangs two blocks held in hands.</p> <p>2.30 Constancy of form (Ex: if bottle handed backward, reverses to find nipple).</p> <p>2.31 Searches for vanished objects.</p>
10-11 Mo.	<p>2.32 Pivots in sitting position.</p> <p>2.33 Shifts from sitting to prone and prone to sitting.</p> <p>2.34 Removes a round object from form board.</p>
11-12 Mo.	<p>2.35 Sits down from free standing position.</p> <p>2.36 Moves to rhythms.</p> <p>2.37 Stands alone.</p> <p>2.38 Walks with help.</p>

11-12 Mo.  
Continued

- 2.39 Marks on paper with crayon.  
2.40 Stacks rings on pegs.

12-15 Mo.

- 2.41 Dumps small object from bottle.  
2.42 Walks alone.  
2.43 Creeps upstairs (4 treads at a time).  
2.44 Throws objects - picks them up again  
(evidence of his ability to release  
an object in his grasp).  
2.45 Rolls ball.  
2.46 Inserts object in hole.

15-18 Mo.

- 2.47 Walks and runs.  
2.48 Walks sideways.  
2.49 Walks backwards.  
2.50 Climbs upon furniture.  
2.51 Creeps downstairs backward (unassisted).  
2.52 Carries objects.  
2.53 Walks upstairs with help.  
2.54 Turns page of book (2-3 pages at once).  
2.55 Builds tower of 2-3 blocks.

18-21 Mo.

- 2.56 Scribbles imitatively.
- 2.57 Makes painting strokes (often in arc).
- 2.58 Walks downstairs, one hand held.
- 2.59 Climbs forward into adults chair turns around and sits.
- 2.60 Correctly places circle and square in form board.

21-24 Mo.

- 2.61 Walks up and down stairs alone, both feet on one step at a time holding onto railing.
- 2.62 Imitates vertical and circular strokes in scribbles.
- 2.63 Squats and rises to standing position without using hands.
- 2.64 Rolls, pounds, and squeezes clay.
- 2.65 Builds tower of five or more blocks.
- 2.66 Makes blocks into a train (two or more).
- 2.67 Opens doors by turning knob.
- 2.68 Kicks a large ball (ground level - stationary).
- 2.69 Strings beads together.
- 2.70 Bends at waist to pick up something off floor (without falling).
- 2.71 Turns pages of book singly.
- 2.72 Folds paper imitatively.
- 2.73 Correctly nests four or more small square boxes.

24-30 Mo.

- 2.74 Stands on either foot and balances.
- 2.75 Pushes and pulls large toys.
- 2.76 Stands on tiptoe (demonstrated).
- 2.77 Jumps off floor.
- 2.78 Throws large ball four to five feet.
- 2.79 Walks between parallel lines - 8 inches apart.
- 2.80 Holds crayon with fingers.
- 2.81 Puts small object in bottle.

30-36 Mo.

- 2.82 Alternates feet going upstairs.
- 2.83 Jumps from bottom stair (8-12 inches).
- 2.84 Rides tricycle using pedals.
- 2.85 Walks tiptoe 10 feet.
- 2.86 Uses scissors.
- 2.87 Traces a square.
- 2.88 Copies drawing of circle.
- 2.89 Copies drawing of cross.
- 2.90 Stacks rings on pegs in order.

36-48 Mo.

- 2.91 Builds bridge from blocks with model.
- 2.92 Traces diamond.
- 2.93 Prints a few capital letters (large, single - anywhere on paper).

36-48 Mo.  
Continued

- 2.94 Builds simple toy.  
2.95 Draws head of person and one other part.

48-60 Mo.

- 2.96 Imitates spreading of hand and bringing thumb into opposition with each finger.  
2.97 Standing broad jump.  
2.98 Running broad jump.  
2.99 Turns somersaults.  
2.100 Throws ball overhand.  
2.101 Hops forward on one foot 4 - 6 hops.  
2.102 Copies square.  
2.103 Ties knot.

60-72 Mo.

- 2.104 Heel to toe walk (10 foot line forward).  
2.105 Heel to toe walk (10 foot line backward).  
2.106 Walks length of walking board.  
2.107 Jumps rope.  
2.108 Dances to music.  
2.109 Draws house - 2 to 5 items.  
2.110 Skips using alternate feet.  
2.111 Catches bounced ball two out of three times.  
2.112 Kicks ball (beginning drop kick).  
2.113 Roller skates.

60-72 Mo.  
Continued

- 2.114 Copies triangle.
  - 2.115 Ties shoes.
  - 2.116 Rides bicycle (may use training wheels).
  - 2.117 Copies rectangle with diagonal.
-

S O C I A L

5-6 Mo.	<p>3.1 Smiles and vocalizes to mirror.</p> <p>3.2 Lifts cup by handle.</p>
6-7 Mo.	<p>3.3 Assists adult by pulling self forward.</p> <p>3.4 Accepts strangers.</p> <p>3.5 Reaches and pats mirror image.</p> <p>3.6 Takes solids.</p> <p>3.7 Explores adult facial features (pulls hair, nose, etc.).</p> <p>3.8 Puts finger food to mouth.</p> <p>3.9 Imitates peek-a-boo.</p> <p>3.10 Imitates pat-a-cake.</p>
7-8 Mo.	<p>3.11 Bites and chews toys (Ex: teething rings).</p> <p>3.12 Waves bye-bye.</p> <p>3.13 Holds own bottle independently.</p>

8-9 Mo.	<p>3.14 Vocalizes ma-ma, da-da, beginning to refer to specific adults.</p> <p>3.15 Feeds self crackers.</p>
9-10 Mo.	<p>3.16 Indicates wants (gestures, vocalizations).</p> <p>3.17 Plays ball with other person.</p>
10-11 Mo.	<p>3.18 Extends toy to person.</p> <p>3.19 Imitates others. Imitates movements already familiar but not visible to him.</p> <p>3.20 Holds cup with two hands.</p> <p>3.21 Gives kisses.</p>
11-12 Mo.	<p>3.22 Extends arms and legs while being dressed.</p> <p>3.23 Washes hands and face with assistance.</p> <p>3.24 Dries hands and face with assistance.</p> <p>3.25 Bowel movement is becoming regular.</p> <p>3.26 Picks up bits of food and transfer to mouth.</p> <p>3.27 Uses spoon imitatively.</p>

12-15 Mo.	3.28	Releases objects in adults hand.
	3.29	Greet with verbal cues.
	3.30	Removes simple garment.
15-18 Mo.	3.31	Bottle discarded.
	3.32	Indicates wet pants.
	3.33	Feeds self in part.
	3.34	Indicates toilet needs.
	3.35	Exhibits emotion in imitation of parents (Ex: affection).
	3.36	Pulls toy behind him while walking.
	3.37	Carries or hugs doll.
	3.38	Removes socks.
	3.39	Removes shoes.
	3.40	Places hat on head, takes it off.
	3.41	Seats self in small chair.
	3.42	Sits on toilet or potty.
18-21 Mo.	3.43	Asks for food, toilet, drink.
	3.44	Holds own cup to lips and drinks.
	3.45	Hands cup back to adult.
	3.46	Puts on simple garment.
	3.47	Zips and unzips large zipper.

<p>18-21 Mo. Continued</p>	<p>3.48 Uses spoon appropriately.</p> <p>3.49 Helps with simple household tasks (Ex: dusting).</p>
<p>21-24 Mo.</p>	<p>3.50 Separates from mother readily.</p> <p>3.51 Remembers where objects belong.</p> <p>3.52 Unwraps coverings.</p> <p>3.53 If unfastened - can remove coat.</p> <p>3.54 If unfastened - can remove pants.</p> <p>3.55 Puts on shoes with assistance.</p>
<p>24-30 Mo.</p>	<p>3.56 Longer periods between eliminations.</p> <p>3.57 Helps put things away.</p> <p>3.58 Carries breakable objects.</p> <p>3.59 Verbalizes toilet needs in time.</p>
<p>30-36 Mo.</p>	<p>3.60 Begins dressing self with assistance.</p> <p>3.61 Indulges in simple "make believe" activities - plays house.</p> <p>3.62 Asks to do things by self (though may not be able to).</p> <p>3.63 Greets without cues.</p> <p>3.64 Shows courtesy with no cues given.</p>

30-36 Mo.  
Continued

- 3.65 Dries hands without help.
- 3.66 Child helps while being bathed.
- 3.67 Takes turns.
- 3.68 Shares play activities.
- 3.69 Uses fork.
- 3.70 Uses napkins.
- 3.71 Gets drink with no help.
- 3.72 Pours liquid from small pitcher.
- 3.73 Sucks through straw.
- 3.74 Knows the difference between bladder and bowel function.
- 3.75 Hangs up coat on hanger or hook.
- 3.76 Avoids hazards.

36-48 Mo.

- 3.77 Completes a meal.
- 3.78 Sets table with assistance.
- 3.79 Sleeps through night without wetting.
- 3.80 Responds to routine times for elimination.
- 3.81 Takes responsibility for toilet himself.
- 3.82 Increasing interest in interactive play with other children rather than playing alone.
- 3.83 Washes hands and face alone.
- 3.84 Answers phone.
- 3.85 Feeds self.
- 3.86 Puts on shoes.

36-48 Mo.

Continued

- 3.87 Unbuttons accessible buttons.
- 3.88 Brushes teeth.
- 3.89 Wipes self.
- 3.90 Blows nose without verbal cue.
- 3.91 Carries out simple errand.
- 3.92 Brushes hair.
- 3.93 Cleans spills.
- 3.94 Apologizes.
- 3.95 Spreads butter, etc. with knife.
- 3.96 Cuts soft food (with fork).
- 3.97 Buttons two medium size buttons.

48-60 Mo.

- 3.98 Chooses menus.
- 3.99 Remains at table throughout meal.
- 3.100 Serves self.
- 3.101 Relates dreams.
- 3.102 Carries on long involved conversations.
- 3.103 Tendency toward self-praise - speaks positively of self.
- 3.104 Puts on socks.
- 3.105 Dresses and undresses with no assistance.
- 3.106 Sets table.
- 3.107 Laces shoes.
- 3.108 Goes about neighborhood unattended.
- 3.109 Tells home address.

48-60 Mo. Continued	3.110	Knows own phone number.
	3.111	Knows birth month and day.
60-72 Mo.	3.112	Tells long story accurately.
	3.113	Cuts and pastes.
	3.114	Paints pictures - recognizable with a few details.
	3.115	Takes care of clothing.
	3.116	Cuts with knife.
	3.117	Demonstrates dialing of own phone number.

In the Social category it is appropriate to survey (ask parent, sitter, teacher, etc.) the following items:

3.25	3.77
3.31	3.79
3.32	3.80
3.34	3.81
3.42	3.82
3.43	3.84
3.50	3.89
3.56	3.90
3.59	3.94
3.62	3.99
3.66	3.100
3.74	3.108
3.76	3.115

ASSESSMENT CONSIDERATIONS

Maintaining rapport is a necessity, but once the child begins to cooperate, interest can usually be maintained by quickly moving along from one task to the next. Materials should be carefully organized so that the child does not lose interest while the examiner gropes for the appropriate toy or profile item.

Questions or tasks, other than memory items, may be repeated or attempted as many times as is realistically necessary to elicit a response.

When asking a child to repeat digits, do not group the numbers in any way. Say them in a monotonous manner at the rate of one per second.

Administration of the profile is not timed and if the child's interest and cooperation cannot be maintained, it may be necessary to stop and continue at a later time.

Testing conditions should be considered. If distractions are too great, find another place.

Mothers, or others, can be present, but they should not be allowed to give the child cues.

If a response is wrong, do not repeat the question or task or show that it is wrong by waiting for another response. Examiners should be alert to possible misunderstanding of directions or faults in hearing or indistinct speech.

SCORING AND REPORT FORMS MAY BE ORDERED FROM THE MARSHALLTOWN PROJECT.  
THEY ARE SOLD IN PACKETS OF 30 FOR \$3.00.

# SCORING AND REPORT FORM

Child's name \_\_\_\_\_ Sex \_\_\_\_\_ Date \_\_\_\_\_

Parent(s) \_\_\_\_\_ Birthdate \_\_\_\_\_

Phone \_\_\_\_\_ Chronological age \_\_\_\_\_

Address \_\_\_\_\_ C.A. in months \_\_\_\_\_

School \_\_\_\_\_ Examiner \_\_\_\_\_

MBDR Communication Age \_\_\_\_\_ months

MBDP Motor Age \_\_\_\_\_ months

MBDP Social Age \_\_\_\_\_ months

MBDP Mean Age \_\_\_\_\_ months

(sum of the 3 subtests divided by 3)

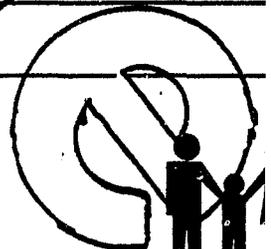
MBDP Developmental Quotient  $\left( \frac{\text{Mean Age}}{\text{C.A.}} \right)$  \_\_\_\_\_

COMMENTS



THE MARSHALLTOWN PROJECT

Developed by:  
**THE MARSHALLTOWN PROJECT**  
507 East Anson Street  
Marshalltown, Iowa 50158  
Phone: 515-752-1723



THE MARSHALLTOWN PROJECT

Sponsored by Area Education Agency 6

**0-1 month (1.00)**  
 — 1.1 Produces vowels (a & e).

**1-2 months (.33)**  
 — 1.2 Listens to human voice.  
 — 1.3 Produces sounds in back of throat (h, g, k).  
 — 1.4 Repeats 1 syllable cooing activity

**2-3 months (.50)**  
 — 1.5 Watches speaker's eyes and mouth.  
 — 1.6 Vocalizes when talked to.

**3-4 months (1.00)**  
 — 1.7 Looks/searches for voice or sound.

**4-5 months (.50)**  
 — 1.8 Stops crying in response to vocal stimulation.  
 — 1.9 Looks/vocalizes. Responds to name.

**5-6 months (1.00)**  
 — 1.10 4 different syllables present in babbling  
 Ex: Da.

**6-7 months (1.00)**  
 — 1.11 Looks when family members/pets are named.

**7-8 months (.33)**  
 — 1.12 Repeats combination of 2 or more sounds.  
 — 1.13 Uses consonants d, m, b, imitatively.  
 — 1.14 Looks at common objects when named.

**8-9 months (.33)**  
 — 1.15 Responds to "NO" - stops activity.  
 — 1.16 Maintains interest full min.-pictures.  
 — 1.17 Some gesture language used.

**9-10 months (.50)**  
 — 1.18 Repeats words other than "mama" / "dada".  
 — 1.19 Uses some exclamations (oh-oh).

**10-11 months (.50)**  
 — 1.20 Follows simple commands (come here).  
 — 1.21 Responds to simple questions. Example: Where's daddy?

**11-12 months (.50)**  
 — 1.22 Consistent use of 3 or more words.  
 — 1.23 Responds verbally to simple requests. Ex: Says bye bye.

**12-15 months**  
 — 1.24 Consists of 2 or more words.  
 — 1.25 Uses nouns tentatively.  
 — 1.26 Listens and jingles.  
 — 1.27 Points to objects.  
 — 1.28 Recognizes major objects.

**15-18 months**  
 — 1.29 Words express needs.  
 — 1.30 Brings object on request.  
 — 1.31 Identifies objects by name.

**18-21 months**  
 — 1.32 Imitates three sentences.  
 — 1.33 Understands personal pronouns (me/her).

**21-24 months**  
 — 1.34 Combines words into sentences.  
 — 1.35 Points to doll or ball on request.  
 — 1.36 Selects group of objects on request.  
 — 1.37 Uses objects for reference.

**0-1 month (1.00)**

- 1 Produces vowels (a & e).

**1-2 months (.33)**

- 2 Listens to human voice.
- 3 Produces sounds in back of throat (h, g k).
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- 5 Watches speaker's eyes and mouth.
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Ex: Da.

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- 11 Looks when family members/pets are named.

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- 1.12 Repeats combination of 2 or more sounds.
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- 1.14 Looks at common objects when named.

**8-9 months (.33)**

- 1.15 Responds to "NO" - stops activity.
- 1.16 Maintains interest full min.-pictures.
- 1.17 Some gesture language used.

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- 1.20 Follows simple commands (come here).
- 1.21 Responds to simple questions. Example: Where's daddy?

**11-12 months (.50)**

- 1.22 Consistent use of 3 or more words.
- 1.23 Responds verbally to simple requests.  
Ex: Says bye bye.

**12-15 months (.60)**

- 1.24 Consistent use of 7 or more words.
- 1.25 Uses the consonants w, t, n, imitatively.
- 1.26 Listens to rhymes and jingles (3 min).
- 1.27 Points to correct objects when named.
- 1.28 Recognizes names of major body parts.

**15-18 months (1.00)**

- 1.29 Words used to express wants and needs.
- 1.30 Brings familiar object on request.
- 1.31 Identifies 2 or more objects from group by naming.

**18-21 months (1.50)**

- 1.32 Imitates two or three word sentence.
- 1.33 Understands personal pronouns (him /her).

**21-24 months (.75)**

- 1.34 Combines words into sentences.
- 1.35 Points to parts of doll or body or clothing
- 1.36 Selects item from group of 5 on request.
- 1.37 Uses own name in reference to self.

**0-1 month (1.00)**  
 — 1.1 Produces vowels (a & e).

**1-2 months (.33)**  
 — 1.2 Listens to human voice.  
 — 1.3 Produces sounds in back of throat (h, g, k).  
 — 1.4 Repeats 1 syllable cooing activity

**2-3 months (.50)**  
 — 1.5 Watches speaker's eyes and mouth.  
 — 1.6 Vocalizes when talked to.

**3-4 months (1.00)**  
 — 1.7 Looks/searches for voice or sound.

**4-5 months (.50)**  
 — 1.8 Stops crying in response to vocal stimulation.  
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**5-6 months (1.00)**  
 — 1.10 4 different syllables present in babbling  
 Ex: Da.

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 — 1.17 Some gesture language used.

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 — 1.24 Consistent use of or more words.  
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**15-18 months (1.00)**  
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 — 1.31 Identifies 2 or more objects from group by naming.

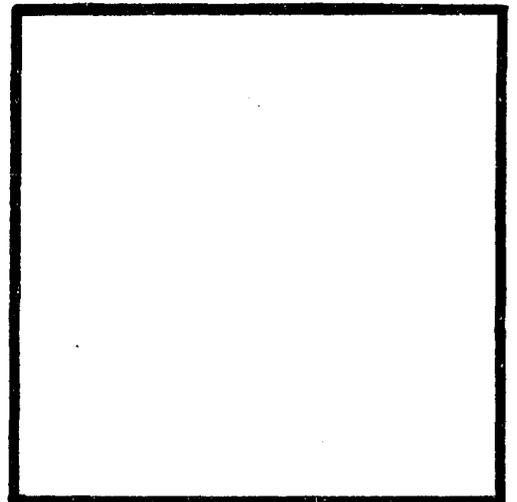
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 — 1.35 Points to parts of doll or body or clothing.  
 — 1.36 Selects item from group of 5 on request.  
 — 1.37 Uses own name in reference to self.

2.09 Draws House

---

2.02 Copies Square



- 24-30 months (.55)**
- \_\_\_ 1.38 Uses personal pronouns correctly.
  - \_\_\_ 1.39 Selects action word pictures.
  - \_\_\_ 1.40 Points to smaller parts of body (knees, elbows, wrists).
  - \_\_\_ 1.41 Identifies objects with functions. Ex: Eat with?
  - \_\_\_ 1.42 Associates body part with their function. Ex: See with.
  - \_\_\_ 1.43 Discriminates objects by size. Ex: Big /little.
  - \_\_\_ 1.44 Matches geometric form with symbol.
  - \_\_\_ 1.45 By request-picks 1 block from group. (Ask for a block.)
  - \_\_\_ 1.46 Matches colors.
  - \_\_\_ 1.47 Gives his full name on request.
  - \_\_\_ 1.48 Repeats 2 numbers correctly.

- 30-36 months (.50)**
- \_\_\_ 1.49 Relates meaning to scribbles/drawings.
  - \_\_\_ 1.50 Describes action pictures when asked.
  - \_\_\_ 1.51 Carries out 3 part simple related order.
  - \_\_\_ 1.52 Relates 2 experiences of day.
  - \_\_\_ 1.53 Repeats sentence of 6 or 7 syllables.
  - \_\_\_ 1.54 Names at least 1 color correctly.
  - \_\_\_ 1.55 Responds motorically to "run", "walk" etc.
  - \_\_\_ 1.56 Identifies hot/cold, wet/dry.

- \_\_\_ 1.57 Tells own gender by request (boy, girl).
- \_\_\_ 1.58 Tells own age when asked.
- \_\_\_ 1.59 Knows prepositions "on", "under", "off".
- \_\_\_ 1.60 Adds (s) to words to form plurals.

- 36-48 months (2.00)**
- \_\_\_ 1.61 Identifies in/out/ beside/in front.
  - \_\_\_ 1.62 Counts 3 objects, pointing to each.
  - \_\_\_ 1.63 Identifies circle, square.
  - \_\_\_ 1.64 Identifies hard/soft /smooth/rough.
  - \_\_\_ 1.65 Joins two parts into whole (of circle/square).
  - \_\_\_ 1.66 Recites rhymes/songs from memory. (Should know 4 lines.)

- 48-60 months (.75)**
- \_\_\_ 1.67 Aesthetic comparisons (pretty, not pretty).
  - \_\_\_ 1.68 Identifies missing object from group of 3.
  - \_\_\_ 1.69 Names/points to dime, nickel, penny on request.
  - \_\_\_ 1.70 Identifies or names three primary colors.
  - \_\_\_ 1.71 Carries out unrelated three part order.
  - \_\_\_ 1.72 Counts and points ten objects.
  - \_\_\_ 1.73 Describes objects using 3 descriptors. Ex: Color, shape, size.

- \_\_\_ 1.74 Differentiating, noon,
- \_\_\_ 1.75 Compares (heavy/light)
- \_\_\_ 1.76 Relates color object w/o. (Ex: red/white)
- \_\_\_ 1.77 Lay out 3 Which is different?
- \_\_\_ 1.78 Sequences /stories/experiences.
- \_\_\_ 1.79 Classifies color form, color (must do all)
- \_\_\_ 1.80 Asks meaning words.
- \_\_\_ 1.81 Demonstrating of words (tomine).
- \_\_\_ 1.82 Repeats week in sequence

- 60-72 months (1.00)**
- \_\_\_ 1.83 Classifies a to shape, the
  - \_\_\_ 1.84 Understands numbers up to 10
  - \_\_\_ 1.85 Recites the numbers to 30.
  - \_\_\_ 1.86 Repeats sequence of digits right 3 times.
  - \_\_\_ 1.87 Knows # fingers on 1 hand & both. (As many?)
  - \_\_\_ 1.88 Knows all colors.
  - \_\_\_ 1.89 Prints first 5 letters
  - \_\_\_ 1.90 Prints numbers through 5.
  - \_\_\_ 1.91 Time concepts (before, after, later, tomorrow, out of 4).
  - \_\_\_ 1.92 Identifies past & following
  - \_\_\_ 1.93 Identifies past & following week.

- 24-30 months (.55)
- .38 Uses personal pronouns correctly.
- .39 Selects action word pictures.
- .40 Points to smaller parts of body (knees, elbows, wrists).
- .41 Identifies objects with functions. Ex: Eat with?
- .42 Associates body part with their function. Ex: See with.
- .43 Discriminates objects by size. Ex: Big /little.
- .44 Matches geometric form with symbol.
- .45 By request-picks 1 block from group. (Ask for a block.)
- .46 Matches colors.
- .47 Gives his full name on request.
- .48 Repeats 2 numbers correctly.
  
- 30-36 months (.50)
- 1.49 Relates meaning to scribbles/drawings.
- 1.50 Describes action pictures when asked.
- 1.51 Carries out 3 part simple related order.
- 1.52 Relates 2 experiences of day.
- 1.53 Repeats sentence of 6 or 7 syllables.
- 1.54 Names at least 1 color correctly.
- 1.55 Responds motorically to "run", "walk" etc.
- 1.56 Identifies hot/cold, wet/dry.

- \_\_\_ 1.57 Tells own gender by request (boy, girl).
- \_\_\_ 1.58 Tells own age when asked.
- \_\_\_ 1.59 Knows prepositions "on", "under", "off".
- \_\_\_ 1.60 Adds (s) to words to form plurals.

36-48 months (2.00)

- \_\_\_ 1.61 Identifies in/out/ beside/in front.
- \_\_\_ 1.62 Counts 3 objects, pointing to each.
- \_\_\_ 1.63 Identifies circle, square.
- \_\_\_ 1.64 Identifies hard/soft /smooth/rough.
- \_\_\_ 1.65 Joins two parts into whole (of circle/ square).
- \_\_\_ 1.66 Recites rhymes/ songs from memory. (Should know 4 lines.)

48-60 months (.75)

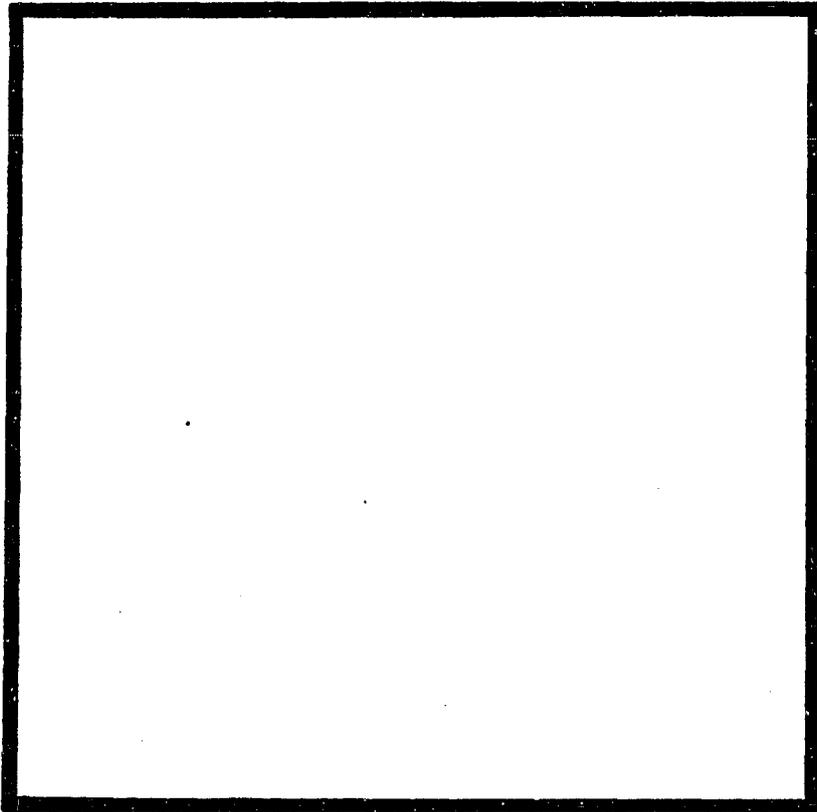
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- \_\_\_ 1.69 Names/points to dime, nickel, penny on request.
- \_\_\_ 1.70 Identifies or names three primary colors.
- \_\_\_ 1.71 Carries out unrelated three part order.
- \_\_\_ 1.72 Counts and points ten objects.
- \_\_\_ 1.73 Describes objects using 3 descriptors. Ex: Color, shape, size.

- \_\_\_ 1.74 Differentiates morning, noon, night.
- \_\_\_ 1.75 Compares weight (heavy/light).
- \_\_\_ 1.76 Relates color to object w/o sample. (Ex: red/apple)
- \_\_\_ 1.77 Lay out 3 objects: Which is different?
- \_\_\_ 1.78 Sequences 4 events /stories/experiences.
- \_\_\_ 1.79 Classifies objects by form, color, use (must do all 3).
- \_\_\_ 1.80 Asks meaning of words.
- \_\_\_ 1.81 Demonstrates meaning of words (pantomime).
- \_\_\_ 1.82 Repeats days of week in sequence.

60-72 months (1.09)

- \_\_\_ 1.83 Classifies according to shape, then color.
- \_\_\_ 1.84 Understands & uses numbers up to 10.
- \_\_\_ 1.85 Recites the numbers to 30.
- \_\_\_ 1.86 Repeats series of 4 digits right 2 out of 3 times.
- \_\_\_ 1.87 Knows # fingers on 1 hand-total on both. (Ask, how many?)
- \_\_\_ 1.88 Knows all 8 basic colors.
- \_\_\_ 1.89 Prints first name.
- \_\_\_ 1.90 Prints numbers 1 through 5.
- \_\_\_ 1.91 Time concepts (before, after, now, later, tomorrow) (3 out of 4).
- \_\_\_ 1.92 Identifies preceding & following #'s to 10
- \_\_\_ 1.93 Identifies preceding & following day of week.

**2.87 Traces Square**



**0-1 month (1.00)**  
 \_\_\_ 2.1 Follows objects to midline.

**1-2 months (.50)**  
 \_\_\_ 2.2 Holds head erect mid-position/while held. (3 sec.)  
 \_\_\_ 2.3 Follows moving object with eyes.

**2-3 months (.50)**  
 \_\_\_ 2.4 Elevates self on forearms. (2 sec.)  
 \_\_\_ 2.5 Holds head erect and steady while held. (sitting)

**3-4 months (.33)**  
 \_\_\_ 2.6 From stomach, lifts head/shoulders 90°.  
 \_\_\_ 2.7 Recovers rattle from his chest.  
 \_\_\_ 2.8 Grasps object placed in hand. (10 sec.)

**4-5 months (.25)**  
 \_\_\_ 2.9 Retains grasp on block in each hand.  
 \_\_\_ 2.10 Sits with slight support.  
 \_\_\_ 2.11 Reaches for objects beyond grasp.  
 \_\_\_ 2.12 Supports large portion of weight. (Stands 4 sec.)

**5-6 months (.20)**  
 \_\_\_ 2.13 Pulls self up into sitting position.  
 \_\_\_ 2.14 Bangs with object held in hand on cue.

\_\_\_ 2.15 Turns stomach to back & back to stomach.  
 \_\_\_ 2.16 Sits erectly in chair.  
 \_\_\_ 2.17 Transfers object from 1 hand to the other.

**6-7 months (.33)**  
 \_\_\_ 2.18 Sits without support.  
 \_\_\_ 2.19 Bounces when held in standing position.  
 \_\_\_ 2.20 Picks up small objects using pincer grasp.

**7-8 months (.50)**  
 \_\_\_ 2.21 Makes stepping movements when held.  
 \_\_\_ 2.22 Stands holding on.

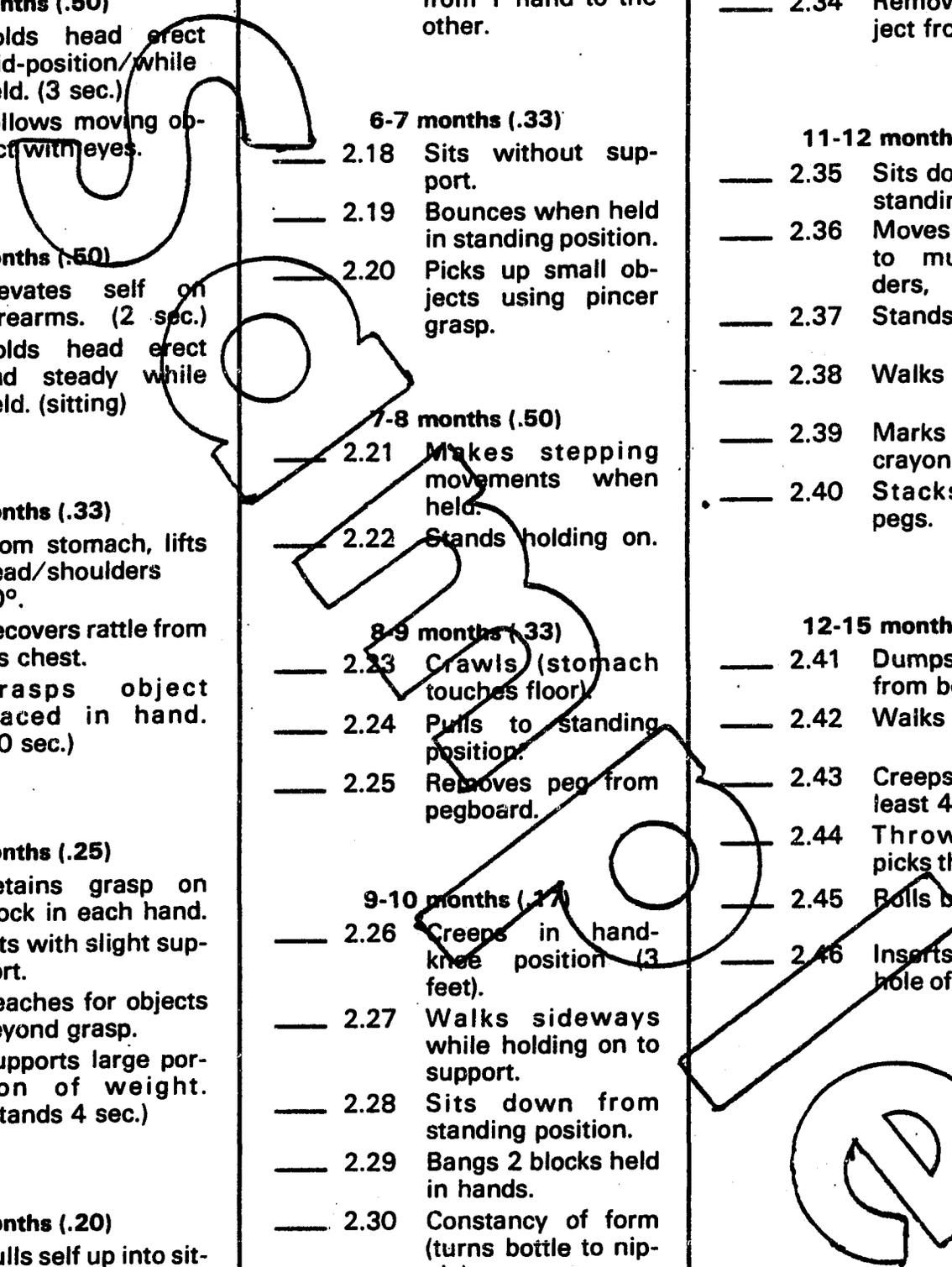
**8-9 months (.33)**  
 \_\_\_ 2.23 Crawls (stomach touches floor).  
 \_\_\_ 2.24 Pulls to standing position.  
 \_\_\_ 2.25 Removes peg from pegboard.

**9-10 months (.17)**  
 \_\_\_ 2.26 Creeps in hand-knee position (3 feet).  
 \_\_\_ 2.27 Walks sideways while holding on to support.  
 \_\_\_ 2.28 Sits down from standing position.  
 \_\_\_ 2.29 Bangs 2 blocks held in hands.  
 \_\_\_ 2.30 Constancy of form (turns bottle to nipple).  
 \_\_\_ 2.31 Searches for vanished objects.

**10-11 months**  
 \_\_\_ 2.32 Pivots in position.  
 \_\_\_ 2.33 Shifts to prone sitting.  
 \_\_\_ 2.34 Removes object from

**11-12 months**  
 \_\_\_ 2.35 Sits down standing.  
 \_\_\_ 2.36 Moves to mudders, l  
 \_\_\_ 2.37 Stands  
 \_\_\_ 2.38 Walks  
 \_\_\_ 2.39 Marks with crayon.  
 \_\_\_ 2.40 Stacks pegs.

**12-15 months**  
 \_\_\_ 2.41 Dumps from box.  
 \_\_\_ 2.42 Walks a  
 \_\_\_ 2.43 Creeps least 4  
 \_\_\_ 2.44 Throws picks th  
 \_\_\_ 2.45 Rolls ba  
 \_\_\_ 2.46 Inserts hole of c



**0-1 month (1.00)**  
 — 2.1 Follows objects to midline.

**1-2 months (.50)**  
 — 2.2 Holds head erect mid-position/while held. (3 sec.)  
 — 2.3 Follows moving object with eyes.

**2-3 months (.50)**  
 — 2.4 Elevates self on forearms. (2 sec.)  
 — 2.5 Holds head erect and steady while held. (sitting)

**3-4 months (.33)**  
 — 2.6 From stomach, lifts head/shoulders 90°.  
 — 2.7 Recovers rattle from his chest.  
 — 2.8 Grasps object placed in hand. (10 sec.)

**4-5 months (.25)**  
 — 2.9 Retains grasp on block in each hand.  
 — 2.10 Sits with slight support.  
 — 2.11 Reaches for objects beyond grasp.  
 — 2.12 Supports large portion of weight. (Stands 4 sec.)

**5-6 months (.20)**  
 — 2.13 Pulls self up into sitting position.  
 — 2.14 Bangs with object held in hand on cue.

— 2.15 Turns stomach to back & back to stomach.  
 — 2.16 Sits erectly in chair.  
 — 2.17 Transfers object from 1 hand to the other.

**6-7 months (.33)**  
 — 2.18 Sits without support.  
 — 2.19 Bounces when held in standing position.  
 — 2.20 Picks up small objects using pincer grasp.

**7-8 months (.50)**  
 — 2.21 Makes stepping movements when held.  
 — 2.22 Stands holding on.

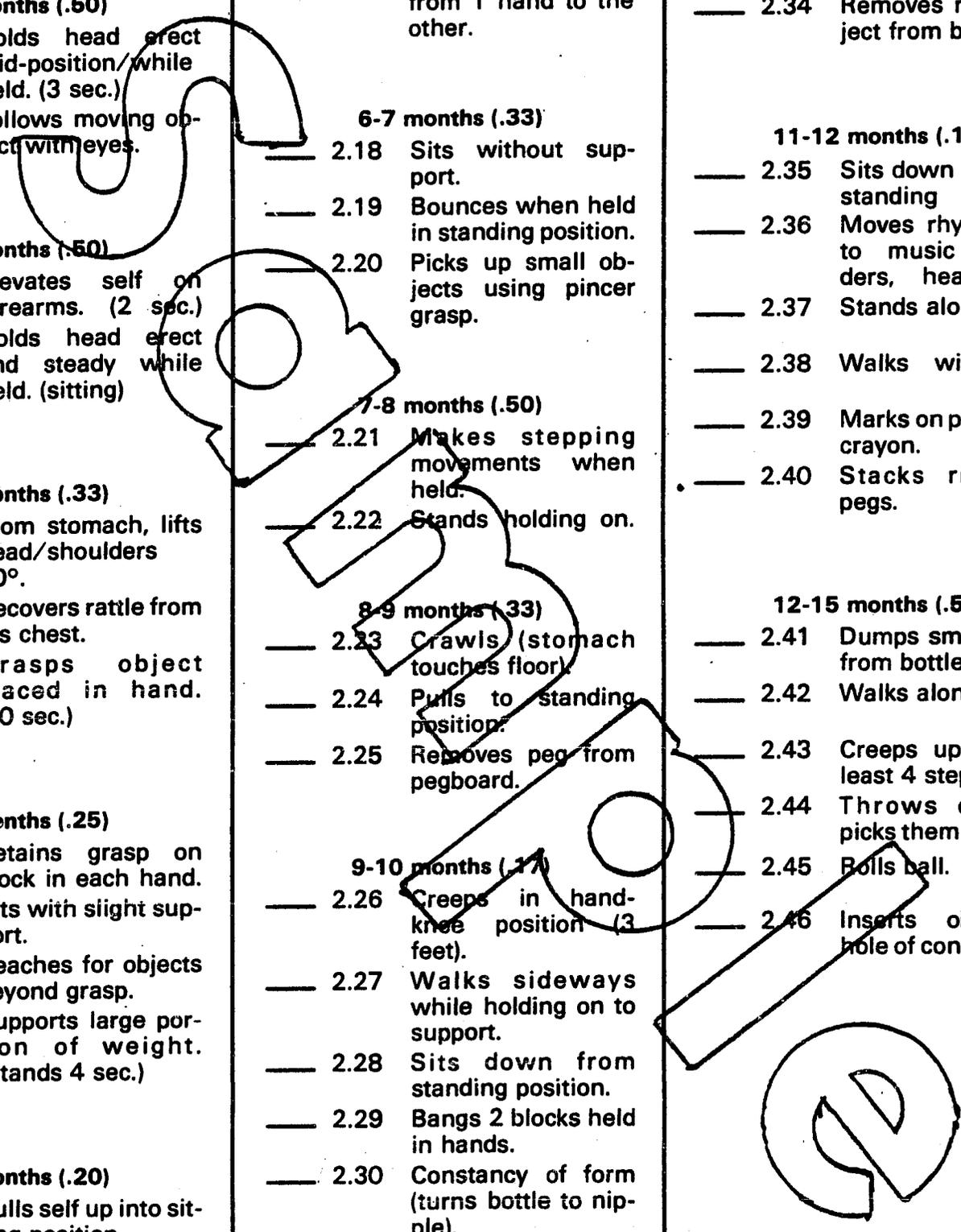
**8-9 months (.33)**  
 — 2.23 Crawls (stomach touches floor).  
 — 2.24 Pulls to standing position.  
 — 2.25 Removes peg from pegboard.

**9-10 months (.17)**  
 — 2.26 Creeps in hand-knee position (3 feet).  
 — 2.27 Walks sideways while holding on to support.  
 — 2.28 Sits down from standing position.  
 — 2.29 Bangs 2 blocks held in hands.  
 — 2.30 Constancy of form (turns bottle to nipple).  
 — 2.31 Searches for vanished objects.

**10-11 months (.33)**  
 — 2.32 Pivots in sitting position.  
 — 2.33 Shifts from sitting to prone and back to sitting.  
 — 2.34 Removes round object from board.

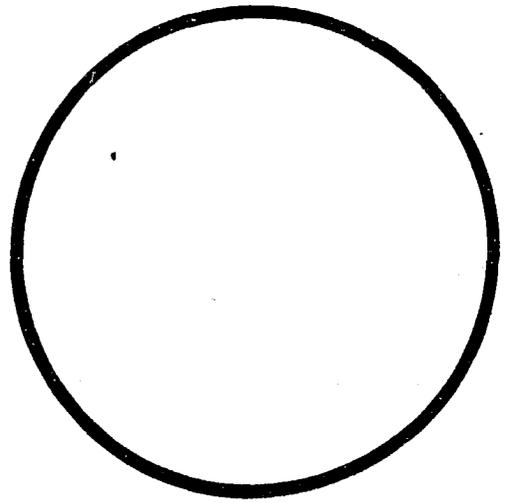
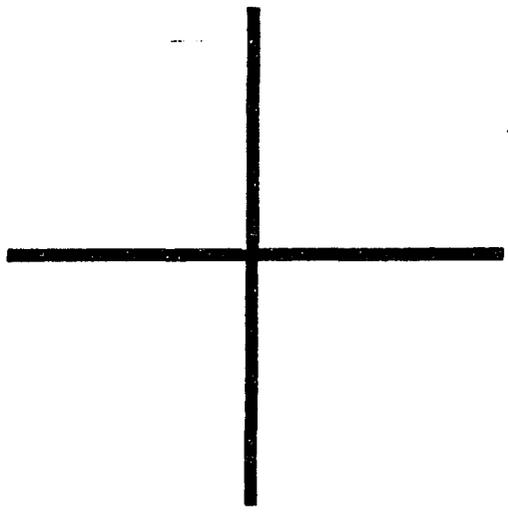
**11-12 months (.17)**  
 — 2.35 Sits down from free standing position.  
 — 2.36 Moves rhythmically to music (shoulders, head, etc.).  
 — 2.37 Stands alone.  
 — 2.38 Walks with help.  
 — 2.39 Marks on paper with crayon.  
 — 2.40 Stacks rings on pegs.

**12-15 months (.50)**  
 — 2.41 Dumps small object from bottle.  
 — 2.42 Walks alone.  
 — 2.43 Creeps upstairs (at least 4 steps).  
 — 2.44 Throws objects-picks them up again.  
 — 2.45 Rolls ball.  
 — 2.46 Inserts object in hole of container lid.



2.89 Copies Cross

2.88 Copies Circle



**15-18 months (.33)**

- \_\_\_ 2.47 Walks and runs.
- \_\_\_ 2.48 Walks sideways.
- \_\_\_ 2.49 Walks backwards.
- \_\_\_ 2.50 Climbs upon furniture.
- \_\_\_ 2.51 Creeps downstairs backward (unassisted).
- \_\_\_ 2.52 Carries objects while walking.
- \_\_\_ 2.53 Walks upstairs with help.
- \_\_\_ 2.54 Turns page of book (2-3 pages at once).
- \_\_\_ 2.55 Builds tower of 2-3 blocks.

**18-21 months (.60)**

- \_\_\_ 2.56 Scribbles imitatively.
- \_\_\_ 2.57 Makes painting stroke (often in arc).
- \_\_\_ 2.58 Walks downstairs, one hand held.
- \_\_\_ 2.59 Sits in adults chair.
- \_\_\_ 2.60 Correctly places circle/square in board.

**21-24 months (.23)**

- \_\_\_ 2.61 Walks up and down stairs alone.
- \_\_\_ 2.62 Imitates vertical & circular strokes.
- \_\_\_ 2.63 Squats & stands without using hands.
- \_\_\_ 2.64 Rolls, pounds, and squeezes clay.
- \_\_\_ 2.65 Builds tower of five or more blocks.
- \_\_\_ 2.66 Makes blocks into a train (2 or more).
- \_\_\_ 2.67 Opens doors by turning knob.

- \_\_\_ 2.68 Kicks a large ball. (Ground level-stationary)
- \_\_\_ 2.69 Strings beads together.
- \_\_\_ 2.70 Bends at waist to pick up things.
- \_\_\_ 2.71 Turns pages of book singly.
- \_\_\_ 2.72 Folds paper in half imitatively.
- \_\_\_ 2.73 Correctly nests 4 or more nesting boxes or cups.

**24-30 months (.75)**

- \_\_\_ 2.74 Stands on either foot and balances.
- \_\_\_ 2.75 Pushes and pulls large wheeled toys.
- \_\_\_ 2.76 Stands on tiptoe for 3 seconds (demonstrated).
- \_\_\_ 2.77 Jumps off floor 2 in. with both feet.
- \_\_\_ 2.78 Throws large ball 4 to 5 feet.
- \_\_\_ 2.79 Walks between parallel lines-8' apart.
- \_\_\_ 2.80 Holds crayon with fingers (not hand).
- \_\_\_ 2.81 Puts small object in pop bottle (example: raisin).

**30-36 months (.67)**

- \_\_\_ 2.82 Alternates feet going upstairs.
- \_\_\_ 2.83 Jumps from 10 inch (approx.) height. Lands without falling.
- \_\_\_ 2.84 Rides tricycle using pedals.
- \_\_\_ 2.85 Walks tiptoe 10 feet maintaining balance (on tiptoes).
- \_\_\_ 2.86 Uses scissors. (Cuts rather than tears.)

- \_\_\_ 2.87 Traces 4 in. with 1/4 in. observing and stopping.
- \_\_\_ 2.88 Copies drawing of circle.
- \_\_\_ 2.89 Copies drawing of cross.
- \_\_\_ 2.90 Stacks rings in order.

**36-48 months (2.00)**

- \_\_\_ 2.91 Builds bridge with blocks with help.
- \_\_\_ 2.92 Traces drawing of diamond.
- \_\_\_ 2.93 Prints few letters (any).
- \_\_\_ 2.94 Builds simple drawing with tinker.
- \_\_\_ 2.95 Draws head, torso & one arm.

**48-60 months (1.00)**

- \_\_\_ 2.96 Touches tip of each finger.
- \_\_\_ 2.97 Standing jump. (Feet together, landing control, feet parallel.)
- \_\_\_ 2.98 Running jump. (Running w/o stop, control.)
- \_\_\_ 2.99 Turns forward somersaults.
- \_\_\_ 2.100 Throws ball with hand.
- \_\_\_ 2.101 Hops forward on one foot 4 feet (demonstrated).
- \_\_\_ 2.102 Copies square.
- \_\_\_ 2.103 Ties simple hand knot.

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- 2.48 Walks sideways.
- 2.49 Walks backwards.
- 2.50 Climbs upon furniture.
- 2.51 Creeps downstairs backward (unassisted).
- 2.52 Carries objects while walking.
- 2.53 Walks upstairs with help.
- 2.54 Turns page of book (2-3 pages at once).
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- 2.56 Scribbles imitatively.
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- 2.58 Walks downstairs, one hand held.
- 2.59 Sits in adults chair.
- 2.60 Correctly places circle/square in board.

- 21-24 months (.23)
- 2.61 Walks up and down stairs alone.
- 2.62 Imitates vertical & circular strokes.
- 2.63 Squats & stands without using hands.
- 2.64 Rolls, pounds, and squeezes clay.
- 2.65 Builds tower of five or more blocks.
- 2.66 Makes blocks into a train (2 or more).
- 2.67 Opens doors by turning knob.

- 2.68 Kicks a large ball. (Ground level-stationary)
- 2.69 Strings beads together.
- 2.70 Bends at waist to pick up things.
- 2.71 Turns pages of book singly.
- 2.72 Folds paper in half imitatively.
- 2.73 Correctly nests 4 or more nesting boxes or cups.

- 24-30 months (.75)
- 2.74 Stands on either foot and balances.
- 2.75 Pushes and pulls large wheeled toys.
- 2.76 Stands on tiptoe for 3 seconds (demonstrated).
- 2.77 Jumps off floor 2 in. with both feet.
- 2.78 Throws large ball 4 to 5 feet.
- 2.79 Walks between parallel lines-8' apart.
- 2.80 Holds crayon with fingers (not hand).
- 2.81 Puts small object in pop bottle (example: raisin).

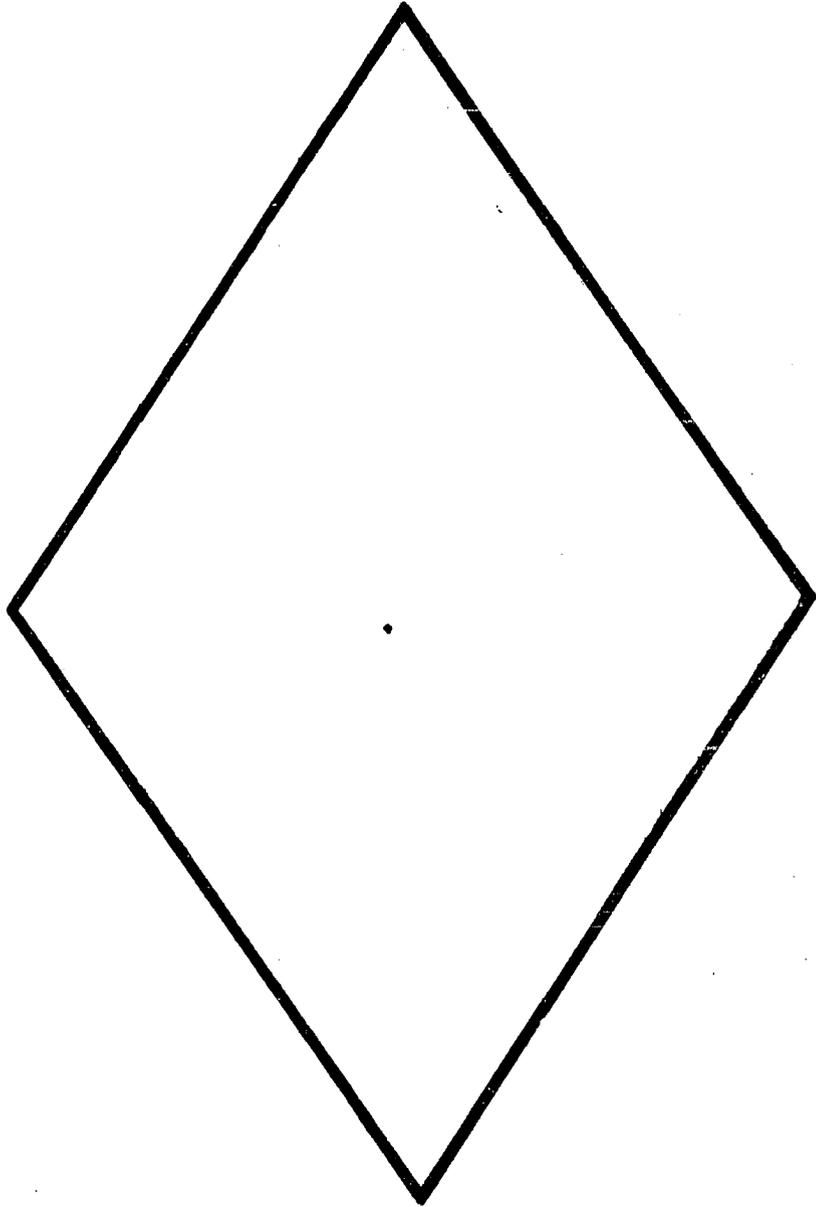
- 30-36 months (.67)
- 2.82 Alternates feet going upstairs.
- 2.83 Jumps from 10 inch (approx.) height. Lands without falling.
- 2.84 Rides tricycle using pedals.
- 2.85 Walks tiptoe 10 feet maintaining balance (on tiptoes).
- 2.86 Uses scissors. (Cuts rather than tears.)

- 2.87 Traces 4 in. square with 1/4 in. tolerance observing starting and stopping points.
- 2.88 Copies drawing circle.
- 2.89 Copies drawing cross.
- 2.90 Stacks rings on peg in order.

- 36-48 months (2.40)
- 2.91 Builds bridge from blocks with model.
- 2.92 Traces diamond.
- 2.93 Prints few capital letters (anywhere).
- 2.94 Builds simple train with tinker toys.
- 2.95 Draws head of person & one other part.

- 48-60 months (1.50)
- 2.96 Touches thumb each finger.
- 2.97 Standing broad jump. (Feet together, land with control, feet parallel.)
- 2.98 Running broad jump. (Run-jump w/o stop, land with control.)
- 2.99 Turns forward somersaults.
- 2.100 Throws ball over hand.
- 2.101 Hops forward one foot 4-6 hops (demonstrated)
- 2.102 Copies square.
- 2.103 Ties simple overhand knot.

2.92 Traces Diamond



## 60-72 months (.86)

- 2.104 Heel to toe walk, forward (8 to 10 feet on line).
  - 2.105 Heel to toe walk, backward (8 to 10 feet on line).
  - 2.106 Walks length of elevated walking board.
  - 2.107 Jumps rope by self (4 jumps).
  - 2.108 Dances to music, with rhythmic movement of limbs. (demonstrated)
  - 2.109 Draws house - 2 to 5 items.
  - 2.110 Skips using alternate feet.
  - 2.111 Catches bounced ball 2 out of 3 times.
  - 2.112 Kicks ball (drop kick).
  - 2.113 Roller skates 3 foot distance.
  - 2.114 Copies triangle.
  - 2.115 Ties shoes.
  - 2.116 Rides bicycle (may use training wheels).
  - 2.117 Copies rectangle with diagonal.
-

**2.95 Draws Head & One Body Part**

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**2.93 Prints Few Capital Letters**

There are no items in the social category until the 5-6 month. Give credit for each month of C.A. (up to 6

- 5-6 months (.50)**
- \_\_\_ 3.1 Smiles and vocalizes to mirror.
  - \_\_\_ 3.2 Lifts cup by handle.

- 6-7 months (.13)**
- \_\_\_ 3.3 Assists adult by pulling self forward
  - \_\_\_ \*3.4 Accepts strangers (half the time).
  - \_\_\_ 3.5 Reaches and pats mirror image.
  - \_\_\_ 3.6 Takes solids (not liquids only).
  - \_\_\_ 3.7 Explores adult facial features.
  - \_\_\_ 3.8 Puts finger food to mouth.
  - \_\_\_ 3.9 Imitates peek-a-boo.
  - \_\_\_ 3.10 Imitates pat-a-cake.

- 7-8 months (.33)**
- \_\_\_ 3.11 Bites and chews toys.
  - \_\_\_ 3.12 Waves bye-bye.
  - \_\_\_ 3.13 Holds own bottle independently.

- 8-9 months (.50)**
- \_\_\_ 3.14 Vocalizes ma-ma, da-da (specific adults).
  - \_\_\_ 3.15 Feeds self crackers.

- 9-10 months (.50)**
- \_\_\_ 3.16 Indicates wants by gestures, vocalizing.
  - \_\_\_ 3.17 Plays ball with other person.

- 10-11 months (.25)**
- \_\_\_ 3.18 Extends toy to person.
  - \_\_\_ \*3.19 Imitates movements w/o demonstration (shakes head no).
  - \_\_\_ 3.20 Holds cup with two hands.
  - \_\_\_ 3.21 Gives kisses.

- 11-12 months (.17)**
- \_\_\_ 3.22 Extends arms & legs while being dressed.
  - \_\_\_ 3.23 Washes hands & face with assistance.
  - \_\_\_ 3.24 Dries hands & face with assistance.
  - \_\_\_ \*3.25 Bowel movement is becoming regular.
  - \_\_\_ 3.26 Picks up bits of food & transfers to mouth.
  - \_\_\_ 3.27 Uses spoon imitatively.

- 12-15 months (1.00)**
- \_\_\_ 3.28 Releases objects into adults hand.
  - \_\_\_ 3.29 Greets with verbal cues.
  - \_\_\_ 3.30 Removes simple garment.

- 15-18 months (.25)**
- \_\_\_ \*3.31 Bottle discarded.
  - \_\_\_ \*3.32 Indicates wet pants.
  - \_\_\_ \*3.33 Feeds self (partly).
  - \_\_\_ \*3.34 Indicates toilet needs.

- \_\_\_ 3.35 Exhibits e imitation
- \_\_\_ 3.36 Pulls toy b
- \_\_\_ 3.37 Carries or
- \_\_\_ 3.38 Removes
- \_\_\_ 3.39 Removes
- \_\_\_ 3.40 Places ha takes it of
- \_\_\_ 3.41 Seats sel chair.
- \_\_\_ \*3.42 Sits on potty.

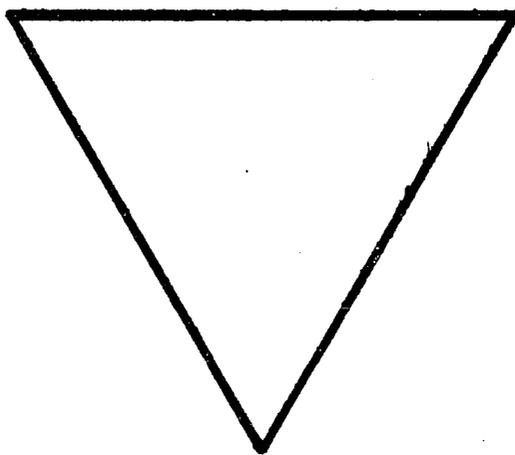
- 18-21 months (.1)**
- \_\_\_ \*3.43 Asks for drink.
  - \_\_\_ 3.44 Holds ow lips and di
  - \_\_\_ 3.45 Hands cu adult.
  - \_\_\_ 3.46 Puts on si ment.
  - \_\_\_ 3.47 Zips and large zippe
  - \_\_\_ 3.48 Uses spoo rriately.
  - \_\_\_ \*3.49 Helps wit household (example:

- 21-24 months (.1)**
- \_\_\_ \*3.50 Separat mother re
  - \_\_\_ 3.51 Remembe objects be
  - \_\_\_ 3.52 Unwraps
  - \_\_\_ 3.53 If faster remove co
  - \_\_\_ 3.54 If unfaster remove pa
  - \_\_\_ 3.55 Puts on s assistance

There are no items in the social category until the 5-6 month. Give credit for each month of C.A. (up to 6 months)

- |  |  |  |
|--|--|--|
| <b>5-6 months (.50)</b>                        | <b>10-11 months (.25)</b>  | <b>3.35 Exhibits emotion in imitation of parents.</b>            |
| 3.1 Smiles and vocalizes to mirror.            | ___ 3.18 Extends toy to person.                                  | ___ 3.36 Pulls toy behind him.                                   |
| 3.2 Lifts cup by handle.                       | ___ *3.19 Imitates movements w/o demonstration (shakes head no). | ___ 3.37 Carries or hugs doll.                                   |
| <b>6-7 months (.13)</b>                        | ___ 3.20 Holds cup with two hands.                               | ___ 3.38 Removes socks.  |
| 3.3 Assists adult by pulling self forward      | ___ 3.21 Gives kisses.   | ___ 3.39 Removes shoes.  |
| *3.4 Accepts strangers (half the time).        | <b>11-12 months (.17)</b>  | ___ 3.40 Places hat on head, takes it off.                       |
| 3.5 Reaches and pats mirror image.             | ___ 3.22 Extends arms & legs while being dressed.                | ___ 3.41 Seats self in small chair.                              |
| 3.6 Takes solids (not liquids only).           | ___ 3.23 Washes hands & face with assistance.                    | ___ *3.42 Sits on toilet or potty.                               |
| 3.7 Explores adult facial features.            | ___ 3.24 Dries hands & face with assistance.                     | <b>18-21 months (.43)</b>  |
| 3.8 Puts finger food to mouth.                 | ___ *3.25 Bowel movement is becoming regular.                    | ___ *3.43 Asks for food, toilet, drink.                          |
| 3.9 Imitates peek-a-boo.                       | ___ 3.26 Picks up bits of food & transfers to mouth.             | ___ 3.44 Holds own cup to lips and drinks.                       |
| 3.10 Imitates pat-a-cake.                      | ___ 3.27 Uses spoon imitatively.                                 | ___ 3.45 Hands cup back to adult.                                |
| <b>7-8 months (.33)</b>                        | <b>12-15 months (1.00)</b>                                       | ___ 3.46 Puts on simple garment.                                 |
| 3.11 Bites and chews toys.                     | ___ 3.28 Releases objects into adults hand.                      | ___ 3.47 Zips and unzips large zipper.                           |
| 3.12 Waves bye-bye.                            | ___ 3.29 Greets with verbal cues.                                | ___ 3.48 Uses spoon appropriately.                               |
| 3.13 Holds own bottle independently.           | ___ 3.30 Removes simple garment.                                 | ___ *3.49 Helps with simple household tasks. (example: dusting). |
| <b>8-9 months (.50)</b>                        | <b>15-18 months (.25)</b>  | <b>21-24 months (.50)</b>  |
| 3.14 Vocalizes ma-ma, da-da (specific adults). | ___ *3.31 Bottle discarded.                                      | ___ *3.50 Separates from mother readily.                         |
| 3.15 Feeds self crackers.                      | ___ *3.32 Indicates wet pants.                                   | ___ 3.51 Remembers where objects belong.                         |
| <b>9-10 months (.50)</b>                       | ___ *3.33 Feeds self (partly).                                   | ___ 3.52 Unwraps coverings.                                      |
| 3.16 Indicates wants by gestures, vocalizing.  | ___ *3.34 Indicates toilet needs.                                | ___ 3.53 If fastened - can remove coat.                          |
| 3.17 Plays ball with other person.             |  | ___ 3.54 If unfastened - can remove pants.                       |
|  |  | ___ 3.55 Puts on shoes with assistance.                          |

2.114 Copies Triangle



**24-30 months (1.50)**

- \_\_\_ \*3.56 Longer periods between eliminations.
- \_\_\_ 3.57 Helps put things away.
- \_\_\_ 3.58 Carries breakable objects.
- \_\_\_ \*3.59 Verbalizes toilet needs in time.

**30-36 months (.35)**

- \_\_\_ 3.60 Begins dressing self with assistance.
- \_\_\_ 3.61 Indulges in simple "pretend" activities.
- \_\_\_ \*3.62 Asks to do things by self even though unable to.
- \_\_\_ 3.63 Greets without cues.
- \_\_\_ 3.64 Shows courtesy with no cues given.
- \_\_\_ 3.65 Dries hands without help.
- \_\_\_ \*3.66 Child helps while being bathed.
- \_\_\_ 3.67 Takes turns.
- \_\_\_ 3.68 Shares play activities.
- \_\_\_ 3.69 Uses fork.
- \_\_\_ 3.70 Uses napkins.
- \_\_\_ 3.71 Gets drink with no help.
- \_\_\_ 3.72 Pours liquid from small pitcher.
- \_\_\_ 3.73 Sucks through straw.
- \_\_\_ \*3.74 Differentiates bladder/bowel function and use correct terms.
- \_\_\_ 3.75 Hangs up coat on hanger or hook.
- \_\_\_ \*3.76 Avoids hazards. (ex: hot, sharp, street).

**36-48 months (.57)**

- \_\_\_ \*3.77 Completes a meal.
- \_\_\_ 3.78 Sets table with assistance.
- \_\_\_ \*3.79 Sleeps through night without wetting.
- \_\_\_ \*3.80 Responds to routine times for elimination.
- \_\_\_ 3.81 Takes responsibility for toilet himself.
- \_\_\_ \*3.82 Increasing interest in interactive play.
- \_\_\_ 3.83 Washes hands and face alone.
- \_\_\_ \*3.84 Answers phone.
- \_\_\_ 3.85 Feeds self (entire meal).
- \_\_\_ 3.86 Slips on shoes.
- \_\_\_ 3.87 Unbuttons accessible buttons.
- \_\_\_ 3.88 Brushes teeth.
- \_\_\_ \*3.89 Wipes self.
- \_\_\_ \*3.90 Blows nose without verbal cue.
- \_\_\_ 3.91 Carries out simple errand.
- \_\_\_ 3.92 Brushes hair.
- \_\_\_ 3.93 Cleans spills.
- \_\_\_ \*3.94 Apologizes.
- \_\_\_ 3.95 Spreads butter, etc. (with knife).
- \_\_\_ 3.96 Cuts soft food. (with fork).
- \_\_\_ 3.97 Buttons two medium size buttons.

**48-60 months (.86)**

- \_\_\_ 3.98 Chooses menu. (Makes appropriate choices from basic food groups)

- \_\_\_ \*3.99 Remains a throughout
- \_\_\_ \*3.100 Serves self.
- \_\_\_ \*3.101 Relates drea
- \_\_\_ 3.102 Carries on volved c sations.
- \_\_\_ 3.103 Speaks p about self.
- \_\_\_ 3.104 Puts on soc
- \_\_\_ 3.105 Dresses & u es (no assis
- \_\_\_ 3.106 Sets table.
- \_\_\_ 3.107 Laces shoes
- \_\_\_ \*3.108 Goes about borhood ur ed (visits bors).
- \_\_\_ 3.109 Tells home
- \_\_\_ 3.110 Knows own number.
- \_\_\_ 3.111 Knows birth and day.

**60-72 months (2.0)**

- \_\_\_ 3.112 Tells long accurately tains 15 se events).
- \_\_\_ 3.113 Cuts out a square & pa
- \_\_\_ 3.114 Paints pictur recognizable
- \_\_\_ \*3.115 Takes care (ing (hang throw in lau
- \_\_\_ 3.116 Cuts soft fo table knife.
- \_\_\_ 3.117 Demonstrating own number.

\*These items may be surveyed by asking the parent.

**24-30 months (1.50)**

- 3.56 Longer periods between eliminations.  
 3.57 Helps put things away.  
 3.58 Carries breakable objects.  
 3.59 Verbalizes toilet needs in time.

**30-36 months (.85)**

- 3.60 Begins dressing self with assistance.  
 3.61 Indulges in simple "pretend" activities.  
 3.62 Asks to do things by self even though unable to.  
 3.63 Greets without cues.  
 3.64 Shows courtesy with no cues given.  
 3.65 Dries hands without help.  
 3.66 Child helps while being bathed.  
 3.67 Takes turns.  
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 3.69 Uses fork.  
 3.70 Uses napkins.

- 3.71 Gets drink with no help.  
 3.72 Pours liquid from small pitcher.  
 3.73 Sucks through straw.  
 3.74 Differentiates bladder/bowel function and use correct terms.  
 3.75 Hangs up coat on hanger or hook.  
 3.76 Avoids hazards. (ex: hot, sharp, street).

**36-48 months (.57)**

- \_\_\_ \*3.77 Completes a meal.  
 \_\_\_ 3.78 Sets table with assistance.  
 \_\_\_ \*3.79 Sleeps through night without wetting.  
 \_\_\_ \*3.80 Responds to routine times for elimination.  
 \_\_\_ 3.81 Takes responsibility for toilet himself.  
 \_\_\_ \*3.82 Increasing interest in interactive play.  
 \_\_\_ 3.83 Washes hands and face alone.  
 \_\_\_ \*3.84 Answers phone.  
 \_\_\_ 3.85 Feeds self (entire meal).  
 \_\_\_ 3.86 Slips on shoes.  
 \_\_\_ 3.87 Unbuttons accessible buttons.  
 \_\_\_ 3.88 Brushes teeth.  
 \_\_\_ \*3.89 Wipes self.  
 \_\_\_ \*3.90 Blows nose without verbal cue.  
 \_\_\_ 3.91 Carries out simple errand.  
 \_\_\_ 3.92 Brushes hair.  
 \_\_\_ 3.93 Cleans spills.  
 \_\_\_ \*3.94 Apologizes.  
 \_\_\_ 3.95 Spreads butter, etc. (with knife).  
 \_\_\_ 3.96 Cuts soft food. (with fork).  
 \_\_\_ 3.97 Buttons two medium size buttons.

**48-60 months (.86)**

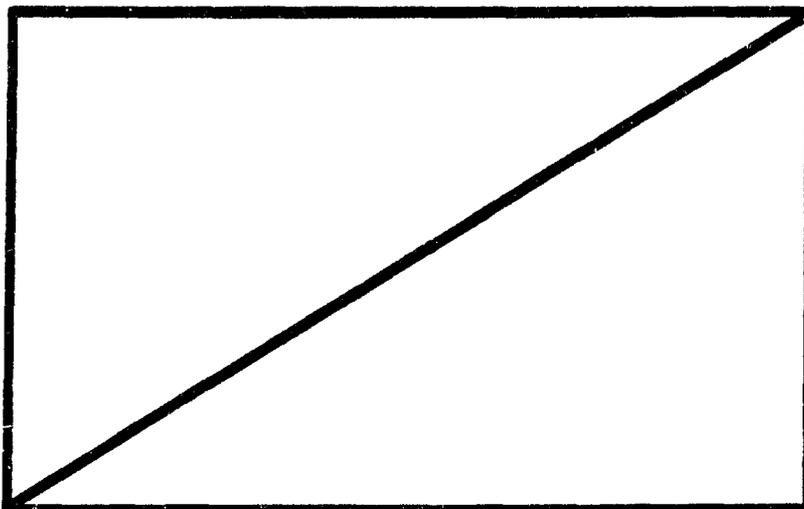
- \_\_\_ 3.98 Chooses menu. (Makes appropriate choices from basic food groups)

- \_\_\_ \*3.99 Remains at table throughout meal.  
 \_\_\_ \*3.100 Serves self.  
 \_\_\_ \*3.101 Relates dreams.  
 \_\_\_ 3.102 Carries on long involved conversations.  
 \_\_\_ 3.103 Speaks positively about self.  
 \_\_\_ 3.104 Puts on socks.  
 \_\_\_ 3.105 Dresses & undresses (no assistance).  
 \_\_\_ 3.106 Sets table.  
 \_\_\_ 3.107 Laces shoes.  
 \_\_\_ \*3.108 Goes about neighborhood unattended (visits neighbors).  
 \_\_\_ 3.109 Tells home address.  
 \_\_\_ 3.110 Knows own phone number.  
 \_\_\_ 3.111 Knows birth month and day.

**60-72 months (2.00)**

- \_\_\_ 3.112 Tells long story accurately (contains 15 sequential events).  
 \_\_\_ 3.113 Cuts out a circle or square & pastes.  
 \_\_\_ 3.114 Paints picture with 2 recognizable items.  
 \_\_\_ \*3.115 Takes care of clothing (hang up or throw in laundry).  
 \_\_\_ 3.116 Cuts soft food with table knife.  
 \_\_\_ 3.117 Demonstrates dialing own phone number.

2.117 Copies Rectangle With Diagonal



COMPUTATION PAGE

Age Segment	COMMUNICATION			MOTOR			SOCIAL		
	# Items Correct	Value of Each Item	Credit	# Items Correct	Value of Each Item	Credit	# Items Correct	Value of Each Item	Credit
0-1		1.00			1.00				
1-2		.33			.50				
2-3		.50			.50				
3-4		1.00			.33				
4-5		.50			.25				
5-6		1.00			.20			.50	
6-7		1.00			.33			.13	
7-8		.33			.50			.33	
8-9		.33			.33			.50	
9-10		.50			.17			.50	
10-11		.50			.33			.25	
11-12		.50			.17			.17	
12-15		.60			.50			1.00	
15-18		1.00			.33			.25	
18-21		1.50			.60			.43	
21-24		.75			.23			.50	
24-30		.55			.75			1.50	
30-36		.50			.67			.35	
36-48		2.00			2.40			.57	
48-60		.75			1.50			.86	
60-72		1.09			.86			2.00	

total \_\_\_\_\_

total \_\_\_\_\_

total \_\_\_\_\_

Communication score \_\_\_\_\_  
(in months)

Motor score \_\_\_\_\_  
(in months)

Social score \_\_\_\_\_  
(in months)

Enter basal age in appropriate credit space

## CONVERSION TABLE

(Yrs./Mos.)

Yrs.	Mos.	Yrs.	Mos.	Yrs.	Mos.
1-0	12	4-0	48	7-0	84
1-1	13	4-1	49	7-1	85
1-2	14	4-2	50	7-2	86
1-3	15	4-3	51	7-3	87
1-4	16	4-4	52	7-4	88
1-5	17	4-5	53	7-5	89
1-6	18	4-6	54	7-6	90
1-7	19	4-7	55	7-7	91
1-8	20	4-8	56	7-8	92
1-9	21	4-9	57	7-9	93
1-10	22	4-10	58	7-10	94
1-11	23	4-11	59	7-11	95
2-0	24	5-0	60	8-0	96
2-1	25	5-1	61	8-1	97
2-2	26	5-2	62	8-2	98
2-3	27	5-3	63	8-3	99
2-4	28	5-4	64	8-4	100
2-5	29	5-5	65	8-5	101
2-6	30	5-6	66	8-6	102
2-7	31	5-7	67	8-7	103
2-8	32	5-8	68	8-8	104
2-9	33	5-9	69	8-9	105
2-10	34	5-10	70	8-10	106
2-11	35	5-11	71	8-11	107
3-0	36	6-0	72	9-0	108
3-1	37	6-1	73	9-1	109
3-2	38	6-2	74	9-2	110
3-3	39	6-3	75	9-3	111
3-4	40	6-4	76	9-4	112
3-5	41	6-5	77	9-5	113
3-6	42	6-6	78	9-6	114
3-7	43	6-7	79	9-7	115
3-8	44	6-8	80	9-8	116
3-9	45	6-9	81	9-9	117
3-10	46	6-10	82	9-10	118
3-11	47	6-11	83	9-11	119

C O M P U T A T I O N T A B L E

(corrected to .0000)(1.000 and 2.000 omitted)

NUMBER  
CORRECT

V A L U E S

1	.13	.17	.20	.23	.25	.33	.35	.43	.50	.55	.57	.60	.67	.75	.86	1.09	1.50	2.40		
2	.25	.33	.40	.46	.50	.67	.71	.86	1.00	1.09	1.14	1.20	1.33	1.50	1.71	2.18	3.00	4.80		
3	.38	.50	.60	.69	.75	1.00	1.06	1.29	1.50	1.64	1.71	1.80	2.00	2.25	2.57	3.27	4.50	7.20		
4	.50	.67	.80	.92	1.00	1.33	1.41	1.72	2.00	2.18	2.29	2.40	2.67	3.00	3.43	4.36	6.00	9.60		
5	.63	.84	1.00	1.16	1.25	1.67	1.77	2.15	2.50	2.73	2.86	3.00	3.33	3.75	4.29	5.46	7.50	12.00		
6	.75	1.00		1.39	1.50	2.00	2.12	2.57	3.00	3.27	3.43		4.00	4.50	5.14	6.55	9.00			
7	.88			1.62	1.75	2.33	2.47	3.00	3.50	3.82	4.00		4.67	5.25	6.00	7.64	10.50			
8	1.00			1.85	2.00	2.66	2.83		4.00	4.36	4.57		5.33	6.00	6.86	8.73	12.00			
9				2.08	2.25	3.00	3.18		4.50	4.91	5.14		6.00	6.75	7.71	9.82				
10				2.31	2.50		3.53		5.00	5.45	5.71			7.50	8.57	10.91				
11				2.54	2.75		3.88		5.50	6.00	6.29			8.25	9.43	12.00				
12				2.77	3.00		4.24		6.00		6.86			9.00	10.28					
13				3.00			4.59				7.43			9.75	11.14					
14							4.94				8.00			10.50	12.00					
15							5.30				8.57			11.25						
16							5.65				9.14			12.00						
17							6.00				9.71									
18											10.29									

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NUMBER  
CORRECT

V A L U E S

1	.13	.17	.20	.23	.25	.33	.35	.43	.50	.55	.57	.60	.67	.75	.86	1.09	1.50	2.40		
2	.25	.33	.40	.46	.50	.67	.71	.86	1.00	1.09	1.14	1.20	1.33	1.50	1.71	2.18	3.00	4.80		
3	.38	.50	.60	.69	.75	1.00	1.06	1.29	1.50	1.64	1.71	1.80	2.00	2.25	2.57	3.27	4.50	7.20		
4	.50	.67	.80	.92	1.00	1.33	1.41	1.72	2.00	2.18	2.29	2.40	2.67	3.00	3.43	4.36	6.00	9.60		
5	.63	.84	1.00	1.16	1.25	1.67	1.77	2.15	2.50	2.73	2.86	3.00	3.33	3.75	4.29	5.46	7.50	12.00		
6	.75	1.00		1.39	1.50	2.00	2.12	2.57	3.00	3.27	3.43		4.00	4.50	5.14	6.55	9.00			
7	.88			1.62	1.75	2.33	2.47	3.00	3.50	3.82	4.00		4.67	5.25	6.00	7.64	10.50			
8	1.00			1.85	2.00	2.66	2.83		4.00	4.36	4.57		5.33	6.00	6.86	8.73	12.00			
9				2.08	2.25	3.00	3.18		4.50	4.91	5.14		6.00	6.75	7.71	9.82				
10				2.31	2.50		3.53		5.00	5.45	5.71			7.50	8.57	10.91				
11				2.54	2.75		3.88		5.50	6.00	6.29			8.25	9.43	12.00				
12				2.77	3.00		4.24		6.00		6.86			9.00	10.28					
13				3.00			4.59				7.43			9.75	11.14					
14							4.94				8.00			10.50	12.00					
15							5.30				8.57			11.25						
16							5.65				9.14			12.00						
17							6.00				9.71									
18											10.29									
19											10.86									
20											11.43									
21											12.00									

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## TEST KIT MATERIALS

Action Cards (6)  $3\frac{1}{2}$  x  $3\frac{1}{2}$ " -  
Colored pictures showing  
child kicking, sleeping,  
running, eating and writing.

Ball - 4 inch diameter

Beads & String -  $1\frac{1}{2}$ " wooden  
beads. String with  
plasticized tip.

Blocks (12) -  $1\frac{1}{2}$ " wooden  
blocks. Used for building,  
counting, and tactual  
discrimination, hard.

Book (1) - 8 x 10" with  
easily identifiable  
pictures of common  
objects.

Bottle & Object - 1" mouth  
with raisin or other  
object inside.

Circles & Squares - 3" -  
2 each in red, blue and  
green. Used for matching  
colors, color identification  
and form identification.

Clay - Rolls, pounds and  
squeezes.

Cotton Ball - Tactual discrimi-  
nation, soft.

Crayon - 8 large kindergarten  
size.

Doll - 8" with easily distin-  
guishable body parts.

Form Board - Circle, square  
and triangle, similar to  
that used in Binet.

Heavy & Light Objects - 2"  
film strip cans, identical  
in appearance, 1 empty -  
1 filled with plaster.

Jump Rope

Manual and Score Sheets

Money - Penny, nickel and dime.

Nested Cups - 5 graduated sizes

Objects (5) - Cup, plate, watch,  
spoon and pencil.

Paper - Unlined,  $8\frac{1}{2}$  x 11

Pegboard and Pegs - 6 x 6"  
board, 25 holes, easy grip  
pegs.

Pencil - Large kindergarten type

Reinforcement - M & M's, suckers,  
etc.

Sandpaper Circle - Tactual discrimi-  
nation, rough.

Scissors - 1 blunt

Stacking Toy - 6 graduated size  
rings

Straw - for drinking

Tinker Toys (8 items) - assemble  
simple toy

Two Halves of Circle - 3" tag-  
board circle.

Walking Strips (2) - 5' long,  
2" wide (Oil Cloth)

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APPENDIX C: PRE-POSTTEST DATA CARD

NO	CAT	HC	ED	PRE TEST				POST TEST									
				M'town Profile CA				M'town Profile CA									
Last Name First				Comm.	Motor	Social	DQ	Comm.	Motor	Social	DQ						
Street Address																	
City County																	
State Zip				Alpern-Boll CA				Alpern-Boll CA									
Phone # Birthdate				PHY	S-H	SOC	ACA	COM	IQ	DQ	PHY	S-H	SOC	ACA	COM	IQ	DQ
Date Eligible																	
Date Phased Out				Slosson CA				Slosson CA									
Months of Service				IQ				IQ									
Diagnosis				Stanford-Binet CA				Stanford-Binet CA									
Home Advisor				IQ				IQ									

APPENDIX D: SURVEY COVER LETTER

# Preschool Division

## Area Education Agency 6



**THE MARSHALLTOWN PROJECT**

Dear Parent,

We are doing a study which involves parents' opinions on current issues. The results of the enclosed questionnaire will be compiled together with the 100 + other parents selected for the study. No names will be used.

Please read the directions on the second page carefully. A self-addressed, stamped envelope is included for you to return your questionnaire. Perhaps you could take a few minutes to do it right now.

Your cooperation is appreciated and your efforts will be helpful to the Project.

Sincerely,

Mel Walden  
Project Director

MW:kv

Enclosure

APPENDIX E: NULL HYPOTHESES

APPENDIX E: NULL HYPOTHESES

- |  |  |
|--|--|
| 1. There is no significant relationship between mother locus of control and developmental change as measured using:<br>a. The Marshalltown Behavioral Developmental Profile<br>b. The Alpern-Boll Developmental Profile  | a. Failed to reject<br>b. Failed to reject |
| 2. There is no significant relationship between teacher locus of control and developmental change as measured using:<br>a. The Marshalltown Behavioral Developmental Profile<br>b. The Alpern-Boll Developmental Profile   | a. Rejected<br>b. Failed to reject         |
| 3. There is no significant relationship between mother locus of control and intellectual change as assessed using a standardized intelligence test.  | Failed to reject                           |
| 4. There is no significant relationship between teacher locus of control and intellectual change as assessed using a standardized intelligence test.   | Failed to reject                           |
| 5. There is no significant relationship between sex and developmental change as measured using:<br>a. The Marshalltown Behavioral Developmental Profile<br>b. The Alpern-Boll Developmental Profile  | a. Failed to reject<br>b. Failed to reject |
| 6. There is no significant relationship between intelligence (at posttest) and developmental change as measured using:<br>a. The Marshalltown Behavioral Developmental Profile<br>b. The Alpern-Boll Developmental Profile   | a. Failed to reject<br>b. Rejected         |
| 7. There is no significant relationship between age (at posttest) and developmental change as measured by:<br>a. The Marshalltown Behavioral Developmental Profile<br>b. The Alpern-Boll Developmental Profile   | a. Rejected<br>b. Failed to reject         |
| 8. There is no significant difference in amount of developmental change as assessed using the Marshalltown Behavioral Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control. | Rejected                                   |

- |     |   |                  |
|-----|---|------------------|
| 8a. | There is no significant difference in amount of communication change as assessed using the Marshalltown Behavioral Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control. | Rejected         |
| 8b. | There is no significant difference in amount of motor change as assessed using the Marshalltown Behavioral Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.         | Rejected         |
| 8c. | There is no significant difference in amount of social change as assessed using the Marshalltown Behavioral Developmental Profile between children whose teachers have an internal locus and children whose teachers have an external locus of control.                   | Rejected         |
| 9.  | There is no significant difference in amount of developmental change as assessed using the Alpern-Boll Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.             | Failed to reject |
| 9a. | There is no significant difference in amount of communication change as assessed using the Alpern-Boll Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.             | Failed to reject |
| 9b. | There is no significant difference in amount of motor change as assessed using the Alpern-Boll Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.                     | Failed to reject |
| 9c. | There is no significant difference in amount of social change as assessed using the Alpern-Boll Developmental Profile between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.                    | Failed to reject |

- |      |   |                  |
|------|---|------------------|
| 10.  | There is no significant difference between pretest Marshalltown Behavioral Developmental Profile quotient scores and Alpern-Boll Developmental Profile quotient scores when sorting on teacher locus of control.  | Failed to reject |
| 11.  | There is no significant difference between posttest Marshalltown Behavioral Developmental Profile quotient scores and Alpern-Boll Developmental Profile quotient scores when sorting on teacher locus of control.   | Failed to reject |
| 12.  | There is no significant difference in amount of intellectual change as assessed using a standardized intelligence test between children whose teachers have an internal locus of control and children whose teachers have an external locus of control.   | Failed to reject |
| 13.  | There is no significant difference in amount of developmental change as assessed using the Marshalltown Behavioral Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group. | Failed to reject |
| 13a. | There is no significant difference in amount of communication change as assessed using the Marshalltown Behavioral Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group. | Failed to reject |
| 13b. | There is no significant difference in amount of motor change as assessed using the Marshalltown Behavioral Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group.         | Failed to reject |

- 13c. There is no significant difference in amount of social change as assessed using the Marshalltown Behavioral Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group. Failed to reject
14. There is no significant difference in amount of developmental change as assessed using the Alpern-Boll Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group. Failed to reject
- 14a. There is no significant difference in amount of communication change as assessed using the Alpern-Boll Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group. Failed to reject
- 14b. There is no significant difference in amount of motor change as assessed using the Alpern-Boll Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group. Failed to reject
- 14c. There is no significant difference in amount of social change as assessed using the Alpern-Boll Developmental Profile between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group. Failed to reject
15. There is no significant difference in amount of intellectual change as assessed using a standard intelligence test between children whose mothers are in the internal locus of control group, children whose mothers are in the middle locus of control group, and children whose mothers are in the external locus of control group. Failed to reject

16. There is no significant difference between pretest Marshalltown Behavioral Developmental Profile quotient scores and Alpern-Boll Developmental Profile quotient scores when sorting on mother locus of control. Failed to reject
17. There is no significant difference between posttest Marshalltown Behavioral Developmental Profile quotient scores and Alpern-Boll Developmental Profile quotient scores when sorting on mother locus of control. Failed to reject
18. There is no significant relationship between developmental change as assessed using the Marshalltown Behavioral Developmental Profile and the following single or combined variables:
- a. PIE (mother internal-external locus of control)
  - b. TIE (teacher internal-external locus of control)
  - c. sex
  - d. pretest IQ
  - e. pretest age
- a. Failed to reject  
b. Rejected  
c. Failed to reject  
d. Rejected  
e. Rejected
19. There is no significant relationship between developmental change as assessed using the Alpern-Boll Developmental Profile and the following single or combined variables:
- a. PIE
  - b. TIE
  - c. sex
  - d. pretest IQ
  - e. pretest age
- a. Failed to reject  
b. Rejected  
c. Failed to reject  
d. Failed to reject  
e. Failed to reject
20. There is no significant relationship between intellectual change as assessed using a standardized intelligence test and the following single or combined variables:
- a. PIE
  - b. TIE
  - c. sex
  - d. pretest IQ
  - e. pretest age
- a. Failed to reject  
b. Failed to reject  
c. Failed to reject  
d. Failed to reject  
e. Failed to reject

APPENDIX F: TREATMENT IV MULTIPLE REGRESSION TABLES

APPENDIX F: TREATMENT IV MULTIPLE REGRESSION TABLES

Table 10. Multiple regression: Developmental change as measured by the Marshalltown Behavioral Developmental Profile (MDIFDQ)

Independent variables	Multiple R	R square	R square change	Simple R	F
TIE	.33473	.11205	.11205	.33473	11.123**
Age pre	.44806	.22076	.08811	-.30459	11.573**
IQ pre	.53751	.28891	.08815	.21188	8.232**
PIE	.54465	.29664	.00773	-.00901	.738
Sex	.54544	.29751	.0087	.02851	.080

\*\*p < .01 ( $F < 3.31$ ).

Table 11. Multiple regression: Developmental change as measured by the Alpern-Boll Developmental Profile (ABDIFDQ)

Independent variables	Multiple R	R square	R square change	Simple R	F
TIE	.15236	.02321	.02321	.15236	2.468*
IQ pre	.21502	.04623	.02302	.13522	.757
Sex	.25177	.06339	.01715	-.09592	1.158
Age pre	.26045	.06783	.00444	-.04291	.315
PIE	.26344	.06940	.00157	.00324	.109

\*p < .05 ( $F < 2.36$ ).

Table 12. Multiple regression: Intellectual change

Independent variables	Multiple R	R square	R square change	Simple R	F
TIE	.10715	.01148	.01148	1.10715	.776
Age pre	.11282	.01273	.00125	.03750	.096
IQ pre	.11373	.01294	.00021	.00195	.015
PIE	.11466	.01315	.01315	.00021	.014

Table 12. Multiple regression: Intellectual change

Independent variables	Multiple R	R square	R square change	Simple R	F
TIE	.10715	.01148	.01148	1.10715	.776
Age pre	.11282	.01273	.00125	.03750	.096
IQ pre	.11373	.01294	.00021	.00195	.015
PIE	.11466	.01315	.01315	.00021	.014