

**Project PRISM: A LONGITUDINAL STUDY OF DEVELOPMENTAL  
PATTERNS OF CHILDREN WHO ARE VISUALLY IMPAIRED**

***Final Report***

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**Kay Alicyn Ferrell, Ph.D.**  
Principal Investigator  
Division of Special Education  
University of Northern Colorado  
Greeley, CO 80639  
kferrell@bentley.unco.edu

970-351-2691  
970-351-1061 FAX

with contributions from

A. Rose Shaw, Ph.D.  
METRICA  
P.O. Box 5167, Greeley, CO 80631  
and  
Sally J. Deitz, Ph.D.  
New York, New York 10046

Office of Special Education Programs  
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# **Project PRISM: A National Longitudinal Study of the Early Development of Children Who Are Visually Impaired**

## **1. Abstract**

The University of Northern Colorado received federal support to conduct a five-year study (1991-96) examining the sequence and rate of development of children ages birth to five years who are blind or visually impaired. Measures of visual acuity, behavior, temperament, and environment were obtained in an effort to identify differences in the development of children who are blind and visually impaired based on standardized assessment norms, while examining within group variation by visual disorders, additional disability, and other factors.

The original grant was awarded to Teachers College, Columbia University in October 1991, then transferred to the University of Northern Colorado in June 1992. The University of Northern Colorado thereafter coordinated the research. Collaborators included The Lighthouse National Center for Vision and Child Development (from 10/1/91 to 5/31/92), the New York Institute for Special Education (from 6/1/92 to 6/30/94), and a consortium of agencies providing services to young children with visual disabilities and their families in Arizona (The Foundation for Blind Children), Colorado (Anchor Center for Blind Children), Kentucky (Visually Impaired Preschool Services), New Mexico (New Mexico School for the Visually Handicapped Preschool), and Texas (Dallas Services for Visually Impaired Children). Additional funding was received from the Hilton/Perkins National Program, through a grant from the Conrad N. Hilton Foundation of Reno, Nevada, which supported an additional two agencies in California (Blind Childrens Center) and Massachusetts (Perkins School for the Blind).

This report presents the analysis of data according to the seven research questions originally proposed in the grant. Results indicate that the greatest impact on developmental outcome appears to be the presence of disabilities in addition to visual

impairment, although differences were also found based on gestational age at birth and some types of visual disorders. Differences were documented in the rate and sequence of acquisition of developmental milestones and developmental inventory scores, but those differences tended to disappear over time.

## **2. Project Objectives**

This project investigated the rate and sequence of development of children between the ages of birth and five years who are blind and visually impaired, by means of a longitudinal study coordinated by the University of Northern Colorado in collaboration with seven service providers from different parts of the country. The study had the following procedural objectives:

1. Establishment of a national consortium of service providers to cooperate in the collection of data.
2. Identification of variables and selection of measurement instruments that would yield useful data.
3. Training of service providers in the assessment battery.
4. Collection of data, including: (a) child variables, (b) family variables, and (c) service variables, for children ages 0-6 who are visually impaired.
5. Yearly analysis of the data regarding patterns emerging in the three sets of variables, their interaction, and their influence on child competence and family adaptation.
6. Yearly dissemination of data to the field.

## **3. Accomplishments**

The project was funded for five years, from October 1, 1991 to September 30, 1996. We requested and received a three-month no-cost extension until December 31, 1996. The project accomplished the following activities in relation to its objectives:

### **Objective 1: Establishment of a national consortium of service providers to cooperate in the collection of data.**

Four agencies originally agreed to participate in the data collection effort:

- Dallas Services for Visually Impaired Children, Dallas, TX  
Carol Danielson, Educational Director
- The Foundation for Blind Children, Phoenix, AZ  
Diane Pea, Infant Coordinator
- The Lighthouse Child Development Center, New York, NY

Sally J. Deitz, Director

- Visually Impaired Preschool Services, Louisville and Lexington, KY  
Sharon Bensinger, Executive Director

The Lighthouse Child Development Center withdrew its participation during the first project year, after Project Evaluators had been trained, but prior to the collection of any data. The Lighthouse was replaced with:

- Anchor Center for Blind Children, Denver, CO  
J Greeley, Educational Director

With the transfer of the project to the University of Northern Colorado, savings in salaries and indirect costs allowed us to add a fifth collaborating agency:

- New Mexico School for the Visually Handicapped Preschool, Albuquerque, NM  
Betty Dominguez, Director (1992-1995)  
Patrika Griego, Site Facilitator (1995-96)

In November 1992, the Hilton/Perkins National Program agreed to sponsor the participation of two of its funded infant programs in the study. The Hilton/Perkins National Program through a grant from the Conrad N. Hilton Foundation of Reno, Nevada, paid for training of the Project Evaluators, site visits by project staff, and purchase of assessment instruments for two additional sites:

- Blind Childrens Center, Los Angeles, CA  
Mary Ellen McCann, Educational Director
- Perkins School for the Blind, Infant and Preschool Services, Watertown, MA  
Tom Miller, Preschool Director

A Technical Advisory Committee (TAC) was established to guide and advise the project. TAC members included parents of infants and youth with visual impairment; adults who were blind and visually impaired; and experts in developmental psychology, infant education, research design, family systems, pediatrics, and ophthalmology.

Meetings of the Technical Advisory Committee were held in New York in December 1991, in Vail, CO, in December 1992, in Phoenix in March 1994, in Albuquerque in

March 1995, and in Denver in November 1996. Members of the Technical Advisory Committee, and the years they served, are listed in Table 1.

The Technical Advisory Committee participated in the identification of sites by suggesting that we confine our selection to programs known to be delivering quality services, but which also enrolled fairly large numbers of children with visual disabilities. We thus eliminated programs with less than 20 new infant referrals per year. Unfortunately, this also meant that we sacrificed our plan to incorporate public agencies utilizing integrated service delivery models, since few generic early intervention programs enrolled a sufficient number of children.

**Table 1. Technical Advisory Committee Members**

Member	Location	Years of Service
<i>Pamela Crane, M.A., C.S.W.</i>	New Jersey Parents Association for the Blind & Visually Impaired, Cranford, NJ	1991-96
Donald B. Bailey, Ph.D., Director	Frank Porter Graham Child Development Center, University of North Carolina at Chapel Hill, Chapel Hill, NC	1993-96
Dr. & Mrs. Gaur	New York, NY	1991
Debra Hamilton, Doctoral Student	University of Oregon, Eugene, OR	1991
Verna Hart, Ed.D., Professor	University of Pittsburgh, Pittsburgh, PA	1991-92
Deborah Hatton, Ph.D.	Frank Porter Graham Child Development Center, University of North Carolina at Chapel Hill, Chapel Hill, NC	1995-96
Amy Horowitz, D.S.W., Director of Research	The Lighthouse, New York, NY	1991
John Justad, J.D.	Fort Collins, CO	1992-96
<i>Corinne Kirchner, Ph.D., Director of Research</i>	American Foundation for the Blind, New York, NY	1991-96
Earl A. Palmer, M.D.	Casey Eye Institute, Oregon Health Sciences Center, Eugene, OR	1991-94
Marianne Riggio	Hilton/Perkins National Program, Perkins School for the Blind, Watertown, MA	1992-96
<i>Stuart Warren Teplin, M.D.</i>	Frank Porter Graham Child Development Center, University of North Carolina at Chapel Hill, Chapel Hill, NC	1991-96

<i>Chris Tompkins, Executive Director</i>	Foundation for Blind Children, Phoenix, AZ	1991-96
Dean W. Tuttle, Ph.D., Professor Emeritus	University of Northern Colorado	1992-96
Din Tuttle, J.D.	Fort Collins, CO	1992-96
James Warnke, C.S.W.	Teaneck, NJ	1993-96
<i>David Warren, Ph.D., Vice Chancellor</i>	University of California at Riverside, Riverside, CA	1991-96
Alana Zambone, Ph.D.	Hilton/Perkins Project, The Perkins School for the Blind, Watertown, MA	1991-92

*Italics indicate TAC Members who served for all five years of the project.*

The Technical Advisory Committee also suggested that Site Coordinators be appointed at each collaborating agency. The individuals named with their agencies above served as Site Coordinators. (In three agencies, Arizona, Colorado, and New Mexico, the Site coordinator was also a Project Evaluator.) Site Coordinators were responsible for supervising the collection of data by the Project Evaluators, and they participated in meetings of the Technical Advisory Committee.

**Objective 2: Identification of variables and selection of measurement instruments that would yield useful data.**

An extensive literature search in educational, medical, and psychological data bases was conducted during the first project year, in order to identify assessment instruments that would meet the purposes of the project. The assessment protocol for the project, listing times of assessment and instruments utilized, is included in Appendix A. Appendix B contains the data collection instruments developed specifically for this study.

When the project ended, we had developed a database of 733 variables. We are creating new variables as we continue to examine the data.

**Objective 3: Training of service providers in the assessment battery for this investigation.**

The Site Coordinators selected at least two Project Evaluators from the staff at each site. Project Evaluators were trained in administration of five standardized instruments:

- Battelle Developmental Inventory (Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1984)
- Home Observation and Measurement of the Environment (Caldwell & Bradley, 1984)
- Milani-Comparetti Motor Development Screening Test (Meyer Children's Rehabilitation Institute, 1990)
- Teller Acuity Cards (Vistech Consultants, 1990)
- Vineland Scales of Adaptive Behavior (Sparrow, Balla, & Cicchetti, 1984)

Inter-observer agreement was computed at each training session and at intervals between training sessions through on-site visits by project staff. Training sessions were held in New York, March 14-18, 1992; Boulder, Colorado, November 5-8, 1992; Phoenix, Arizona, March 19-24, 1994; and Louisville, Kentucky, March 29-April 2, 1995. At the Project Evaluators' request, training sites varied, to give the evaluators an opportunity to observe each other's early childhood programs. Numbers trained and retention rates are indicated in Table 2.

Table 2. Number of Returning and New Project Evaluators Trained, by Year

	New York 1992	Boulder 1992	Phoenix 1994	Louisville 1995	Denver 1996
New evaluators	9	8	4	2	
Returning evaluators		7	15	18	19
Total trained	9	15	19	20	19

**Objective 4: Collection of data, including (a) child variables; (b) family variables; and (c) service variables for children ages 0-6 who are visually impaired.**

The Technical Advisory Committee suggested that participant children be recruited prior to the age of 12 months and as soon as possible after referral to each

collaborating agency. Data thus flowed into project headquarters at the University of Northern Colorado in waves, described later in the data analysis section. Two hundred two families agreed to participate in the study. Mean age of participant children at entry into the project was 8.67 months ( $n = 196$ ); the youngest child assessed was less than one month old, while the oldest child assessed was 60 months old. Data were coded and entered onto PCs, using SPSS for Windows.

**Objective 5: Yearly analysis of the data regarding patterns emerging in the three sets of variables, their interaction, and their influence on child competence and family adaptation.**

On the advice on the Technical Advisory Committee, only demographic information was analyzed and disseminated prior to the end of the project. Project staff prepared two PRISM *Rainbows* (newsletters), found in Appendix C. The completed data analysis is found later in this report.

**Objective 6: Yearly dissemination of data to the field.**

During the five years of the project, presentations on Project Prism were presented at the following meetings and conferences:

- Keynote Address, McFarland Seminar, International Conference of the Association for Education and Rehabilitation of the Blind and Visually Impaired (AERBVI), Los Angeles, CA, June 30, 1992
- Concurrent Session, Division VIII (Infant and Preschool), International Conference of the Association for Education and Rehabilitation of the Blind and Visually Impaired (AERBVI), Los Angeles, CA, July 2, 1992
- International Council for Education of Individuals with Visual Impairments Quinquennial Conference, Bangkok, Thailand, August, 1992
- Society for Disability Studies, Seattle, Washington, June 17-19, 1993.
- Eighth International Conference on Blind and Visually Impaired Children, Edmonton, Alberta, Canada, September 29-October 2, 1993.
- Council for Exceptional Children, Teacher Education Division National Conference, Orlando, FL, November 1993
- The Association for Persons with Severe Handicaps, Chicago, IL, November 1993
- National Center for Clinical Infant Programs Training Conference, Dallas, TX, December 1994
- Council for Exceptional Children International Convention, Denver, CO, April 1994
- Association for Education and Rehabilitation of the Blind and Visually Im-

- paired, International Conference, Dallas, TX, July 1994
- Texas Focus, Fort Worth, TX, June 1996
- Association for Education and Rehabilitation of the Blind and Visually Impaired International Conference, St. Louis, MO, July 1996

PRISM *Rainbows* were distributed to all families, personnel, and persons who had asked to be kept informed of the project in September 1994 and February 1996. These newsletter-type documents were written primarily for the families involved in the project and are found in Appendix C.

Although the Technical Advisory Committee cautioned us against publishing data too soon, a description of the project was printed in the December 1994 issue of the *Journal of Visual Impairment & Blindness*. A copy of this article is also found in Appendix C. For a time, this article appeared on the World Wide Web at <http://www.afb.org/jvib>.

#### **Other Accomplishments**

The project director's position was somewhat problematic, particularly after the project moved to the University of Northern Colorado. A subcontract was completed with The Lighthouse, Inc., for the services of Sally J. Deitz, Ph.D., as Project Director, who was then the Director of The Lighthouse Child Development Center. Dr. Deitz left the employ of the Lighthouse on May 31, 1992, and the subcontract was canceled. Since Dr. Deitz' relocation coincided with the transfer of the grant to the University of Northern Colorado, a new subcontract was implemented between the University of Northern Colorado and the New York Institute for Special Education, where Dr. Deitz was then Coordinator of Research. The original subcontract purchased .40 FTE of Dr. Deitz's time. For the third year of the project, the subcontract was reduced to .20 FTE, to reflect changes in project responsibilities necessitated by the project's relocation to Colorado. The subcontract with the New York Institute for Special Education terminated on June 30, 1994, when Dr. Deitz left its employ. Her new employer did not wish to enter into a subcontract, but was willing to give Dr. Deitz time to work on this project.

Consequently, for years 4 and 5, we hired Dr. Deitz on a consultant basis. (At the same time, the Grants Officer informed us that Dr. Deitz could not serve as Project Director since the university did not employ her, and the Principal Investigator assumed the title of Principal Investigator/Project Director.) Dr. Deitz's time was reduced further during the last project year, with the focus on data analysis and the re-assignment of her previous responsibilities among staff based at the University of Northern Colorado.

The Research Assistant position has also been problematic, as few students have been able to commit five years to the project. The Research Assistant for the first two project years was Linda A. Mamer, Ed.D., now at the Provincial Outreach Center for Students with Deafblindness in British Columbia and the University of British Columbia. Another Research Assistant, Kelton Lustig, Ed.D., was hired for the third project year. For the fourth and fifth project years, Kevin A. Stewart, Ed.D., worked with the project year-round. Dr. Stewart completed his coursework and terminated residency in September 1996, but returned to complete some of our site visits in October and November.

The position of Project Secretary also experienced changes. We shared our secretary with another federally funded project. The original secretary left in May 1994 for health concerns, and Lisa Baird Speaker replaced her. Ms. Speaker has a master's degree in counseling and her familiarity with research methodology proved invaluable to the project. During the three-month no-cost extension, Ms. Speaker was largely responsible for data coding and entry on an overtime basis.

#### **4. Assessment Protocol**

Project Evaluators were trained in the assessment protocol described in detail in Appendix A. Three types of data were collected (information on children, information on family, and information on services), either by Project Evaluators during home visits to participating families, or by family members completing a set of questionnaires independently. Not all data were collected at every assessment point, as the protocol

in Appendix A indicates.

### **Assessment Instruments**

After an extensive review by project staff and the TAC, 21 separate instruments, some developed specifically for this project, were utilized for data collection. These instruments are listed in Table 3 by the type of information collected and the source of information. Instruments developed for this project are included alphabetically in Appendix B, along with their Spanish translations (if available). Copyrighted instruments are not included in the appendix.

### **Training of Project Evaluators**

At least two Project Evaluators were selected by each agency for participation in the project. In exchange for the commitment of staff, each agency received an annual payment of \$1950 and free assessment instruments (the Hilton/Perkins Project paid for the assessment instruments, but no annual payment, for its two sites). The project was extremely fortunate to have the cooperation of these agencies, as the number of

**Table 3. Data Collection Instruments, by Type and Source of Information**

Source of Information	Type of Information Collected		
	Child Measures	Family Measures	Service Measures
Project Evaluators	ABILITIES Index (Simeonsson & Bailey, 1991) Battelle Developmental Inventory (Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1984) Child Medical Questionnaire (PRISM developed) Intake Birth History (PRISM developed) Milani-Comparetti Motor Development Screening Test (Meyer Children's Rehabilitation Institute, 1990) Teller Acuity Cards (Vistech Consultants, Inc., 1990) Vineland Scales of Adaptive Behavior (Sparrow, Balla, & Cicchetti, 1984)	Family Demographics Questionnaire (PRISM developed) Home Observation and Measurement of the Environment (Caldwell & Bradley, 1984)	Primary Interventionist's Perception of Services (PRISM developed) Service Questionnaire (PRISM developed)
Parents	Behavioral Style Questionnaire (McDevitt, 1975) Child Health Status (Lewis, Pantell, & Kieckhefer, 1989) <sup>2</sup>	Family Income Form (PRISM developed) <sup>2</sup> Family Resource Scale (Leet & Dunst, 1988) <sup>2</sup>	Parent Evaluation of Services Questionnaire (PRISM developed) <sup>2</sup>

Early Infancy Temperament Questionnaire (Medoff-Cooper, Carey & McDevitt, 1990) <sup>2</sup>	Parenting Stress Index (Abidin, 1983) <sup>2</sup>
Functional Status II(R) Scale (Lewis, Pantell, & Kieckhefer, 1989) <sup>2</sup>	
Infant Temperament Scale (Carey & McDevitt, 1977) <sup>2</sup>	
Toddler Temperament Scale (Fullard, McDevitt, & Carey, 1978) <sup>2</sup>	

<sup>2</sup>These forms were translated into Spanish for PRISM participants by Jan D. Gibboney, Translators, Fairfax, VA

hours committed by Project Evaluators increased each year as more children were added to the study.

One commitment required of Project Evaluators was an annual training to assure reliability in administration of standardized tests. The first training was held in New York City in March 1992 and involved the initial four agencies. A second training was held in November 1992, necessitated by the project's move to the University of Northern Colorado and the addition of four new sites. (This training occurred in the second project year and involved no additional expense.) Training consisted of review of standardized procedures for each test, practice in administering tests, discussion of scoring on test items, and computation of interobserver agreement to determine reliability. Live children and parents were utilized for the first training, but later training sessions utilized video-taped assessments of project participants made during on-site visits by project staff. Our decision to abandon live assessments was based on the amount of discussion time requested by Project Evaluators and the difficulty in scheduling live participants within our training times (scheduled for 12 hours a day, including weekends). As the number of Project Evaluators increased, however, we became more convinced that live participants would be unfair and intimidating to children and parents. Annual training sessions averaged 40 hours of training and about 14 hours of eating (one Project Evaluator suggested a knife, fork, and spoon as the project logo). Evaluators who remained with the project for the five years thus received approximately 200 hours of assessment training (and unknown numbers of calories). The individuals who partici-

pated in the project as evaluators are listed in Table 4. Project Evaluators were required to obtain .80 agreement with project staff before conducting an actual PRISM assessment with a live participant.

Table 4. Project Evaluators

Agency	Evaluator	Years of Service
Anchor Center for Blind Children, Denver, CO	J Greeley	1992-96
	Janis Mountford	1995
	Beth Teeters	1992-94
Blind Childrens Center, Los Angeles, CA	Lynne Webber	1992-96
	Marion Yoshida	1992-96
Dallas Services for Visually Impaired Children, Dallas & Fort Worth, TX	Brenda Hoy	1994-96
	<i>Carol King</i>	1991-96
	Jan Nash	1994-96
	Schel Niethoefer	1994-96
	Debbie Symington	1992-94
Foundation for Blind Children, Phoenix, AZ	Ann Estensen	1994-96
	Amy Murphy	1995-96
	Kelly Parish	1995-96
	<i>Diane Pea</i>	1991-96
	Tina Sustaeta	1991-94
	<i>Patti Watts</i>	1991-96
New Mexico School for the Visually Handicapped Preschool, Albuquerque, NM	Fran Black	1992-94
	Patrika Griego	1992-96
	Dana King	1995-96
	Sharon Nichols	1994-95
Perkins School for the Blind, Watertown, MA	Deborah Gleason	1992-96
	Laurie Hudson	1992-96
Visually Impaired Preschool Services, Louisville & Lexington, KY	<i>Terry Goldfarb</i>	1991-96
	<i>Suze Staugus</i>	1991-96

### **Interobserver Agreement**

Five of the assessment instruments required standardized administration and scoring. Inter-observer agreement was computed for these five instruments at each of

four training sessions and during on-site check-up visits to each collaborating agency between training sessions. Project staff were used as the standard for agreement, using the formula:

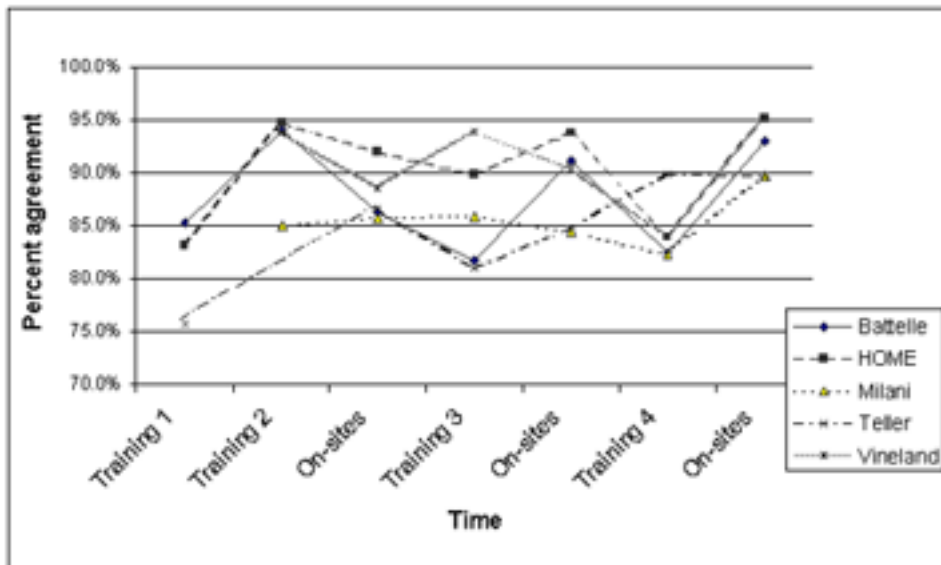
Results for all interobserver agreements are presented in Table 5. Mean interobserver agreement for all tests ranged from 83.6% to 91.2% during training, for an overall mean of 86.7%. Mean inter-observer agreement during on-site follow-up visits ranged from 89.7% to 95.2%, for an overall mean of 92.9%. At the end of the project, inter-observer agreement was calculated at 83.2% for all five instruments. Complete data for all interobserver agreement computation are found in Supporting Tables D-1 to D-4 in Appendix D.

Table 5. Interobserver Agreement for Standardized Assessments at Trainings, On-site Visits, and at Project End

	Percent agreement					
	Battelle	HOME	Milani	Teller	Vineland	Mean
Mean for all trainings	85.9	88.4	85.6	83.6	91.2	86.7
Mean for all sites Between trainings	92.9	95.1	89.7	89.7	95.2	92.9
Agreement at end of project	80.6	85.4	75.8	91.0	83.2	83.2

Looking only at the data in Table 5, one might conclude that interobserver agreement declined over the life of the project. But, as Figure 1 indicates, mean agreement was always above 80.0%, with the exception of one training. The majority of means were above 85.0%. Figure 1 shows that the general trend was for agreement to increase over the course of the project, except for the Vineland Scales, which seemed to fluctuate up and down.

Figure 1. Mean Interobserver Agreement Throughout Course of Project



The lower agreement scores at the end of the project (shown in Table 5) are most likely an artifact of the project itself: Project Evaluators were last measured two months after the end of the project and had not administered or scored any of the tests during that interim period. Given the lack of practice, a mean agreement over 80.0% seems noteworthy. The Project Evaluators' ability to maintain a high degree of agreement over the five years of the project is largely attributed to the quality of their professional skills. Their skills contributed greatly to the strength of our findings and lend confidence to the results. We were fortunate to obtain their participation.

### Assessment Ages

Site Coordinators (or other designated staff) approached each new referral to their agencies about participating in Project PRISM, provided a description of project procedures, and asked parents to read and sign the permission form (see Appendix B) if they chose to participate. Project Evaluators then scheduled an initial assessment, followed by assessment updates at chronological ages of 4, 8, 12, 18, 24, 36, 48, and 60 months. As more children entered the study, maintaining the original assessment

schedule became difficult, and Project Evaluators were instructed to conduct their updates in intervals that corresponded with age intervals on the Battelle Developmental Inventory (BDI) (0-5 months; 6-11 months; 12-17 months; 18-23 months; 24-35 months; 36-47 months; 48-59 months; and 60-71 months), but at least two months apart. For example, if the 18-month assessment were missed, Project Evaluators would try to schedule an assessment prior to the age of 23 months. The next assessment for that child, however, was scheduled at least two months after the previous assessment, but always within the next BDI age interval. For various reasons — most of which were related to the uncertainties of home visits, child illness, and the exigencies of everyday life — all children did not receive all assessments in each age interval once they entered the project.

The mean age at project entry was 8.67 months (s.d. = 3.08, n = 196, median = 9.00). Table 6 provides the mean, median, and modal ages for all children assessed during each assessment interval, while Figure 2 displays this same information graphically in boxplots. Age at assessment during the younger age intervals varied according to when families were referred for services and entered the project. Starting at 12-17 months, however, mean and median ages were close to the beginning of the age interval, suggesting that Project Evaluators were better able to schedule assessments as the children grew older.

Table 6. Mean, Median, and Modal Chronological Age of Participant Children at Each Assessment Interval

	Chronological Age at Assessment Interval							
	0-5	6-11	12-17	18-23	24-35	36-47	48-59	60-71
	mos.	mos.	mos.	mos.	mos.	mos.	mos.	mos.
Mean	3.89	8.95	13.06	18.97	25.52	37.46	49.82	60.00
s.d.	1.14	1.73	1.59	1.31	2.34	2.93	1.87	
Mode	5.00	11.00	12.00	18.00	24.00	36.00	48.00	60.00
25th percentile	3.00	8.00	12.00	18.00	24.00	36.00	48.00	
50th percentile	4.00	9.00	12.00	19.00	24.00	36.00	50.00	
75th percentile	5.00	11.00	14.00	19.00	26.00	37.00	51.00	
Number of entries at this	36	169	124	113	109	63	28	1

interval

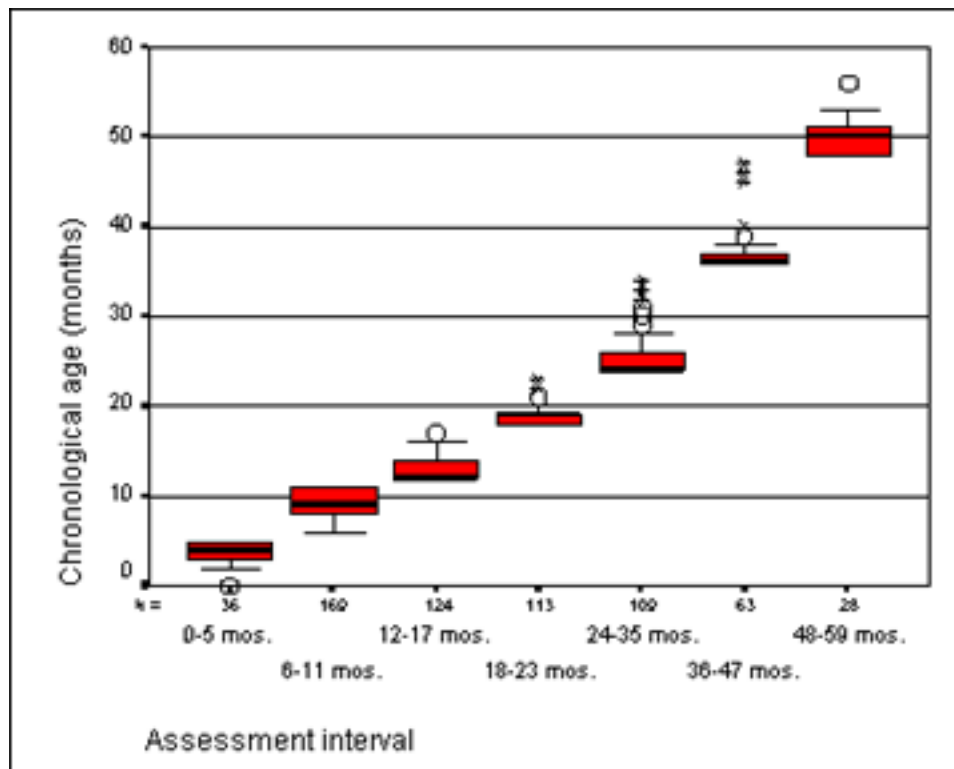
Figure 2. Boxplot of Chronological Age of Participant Children at Each Assessment Interval

**Number of Standardized Test Administrations**

The total number of standardized assessments made at each age interval is shown in Table 7. The most data are available for children between the ages of 6-11 and 24-35 months. Given the opportunities for assessment (see footnote 4), the best rate of assessment across age intervals (see Table 7) ranged from 79.0 - 100.0%. The Battelle was administered most often, achieving 569 of 643 assessment opportunities, or 88.5%. The HOME was administered next frequently, at 84.6%, followed by the Teller (84.4%), the Vineland (84.3%), and the Milani (38.6%). The Milani was administered far less often than any of the other tests. However, the Milani was not introduced until project year 2 and was not valid for administration to children over the age of two years. Its low rate of administration across valid age intervals (36.7-54.9%) is most likely attributable to Project Evaluators' discomfort with this particular assessment.

Table 7. Number of Standardized Assessments Obtained at Each Age Interval

	<b>Assessment Interval</b>								Total
	0-5	6-11	12-17	18-23	24-35	36-47	48-59	60-71	
	mos.	mos.	mos.	mos.	mos.	mos.	mos.	mos.	
Battelle	31	152	98	98	101	60	28	1	569
HOME	30	138	95	97	102	56	25	1	544
Milani	15	62	48	62	55	6	0	0	248
Teller	31	154	88	91	98	53	28	0	543
Vineland	31	151	91	97	94	53	24	1	542
Total	138	657	420	445	450	228	105	3	2446
Ratio of administrations to opportunities	86.1	91.1	79.0	86.7	93.6	95.2	100.0	100.0	



### Number of Standardized Assessments per Child

Table 8 provides the mean, median, and modal number of test administrations per project participant. Half of the participant children received three or more administrations of the Battelle, HOME, Teller, and Vineland, but only one administration of the Milani.

Table 8. Number of Assessments per Test per Participant Child

	Battelle	HOME	Milani	Teller	Vineland
Mean	2.82	2.69	1.23	2.68	2.68
s.d.	1.55	1.46	1.11	1.53	1.51
Median	3	3	1	3	3
Modal	4	4	1	3	1

Table 9 indicates the number and proportion of children receiving repeated test administrations. For each test, some individual children were not assessed at all using that particular test. This ranged from 4.0% (n = 8) of the participant children who did not

receive a Vineland, to 30.7% (n = 62) of the participant children who did not receive a Milani. Seventy-five-point-eight (75.8) percent of the participant children received two or more Battelles; 74.3% received two or more HOMES; 73.6% received two or more Tellers; and 72.3% received two or more Vinelands. Almost three-fourths of the participant children course, was the Milani, where about 1/3 of the group received no assessments, 1/3 had thus received at least two administrations of four standardized tests. The exception, of one assessment, and about 1/3 had two or more assessments. The numbers of assessments at each chronological age for each test are detailed in Table 10.

Table 9. Number and Percent of Children Receiving Multiple Test Administrations

Number of administrations per child	Battelle		HOME		Milani		Teller		Vineland	
	n	%	n	%	n	%	n	%	n	%
None	10	5.0	10	5.0	62	30.7	14	6.9	8	4.0
1	39	19.3	42	20.8	66	32.7	39	19.3	48	23.8
2	41	20.3	43	21.3	49	24.3	40	19.8	41	20.3
3	38	18.8	36	17.8	17	8.4	44	21.8	41	20.3
4	42	20.8	50	24.8	7	3.5	36	17.5	36	17.8
5	26	12.9	18	8.9	1	0.5	27	13.4	23	11.4
6	6	3.0	3	1.5	0	0	1	.5	5	2.5
7	0	0	0	0	0	0	1	.5	0	0
Total	202	100.0	202	100.0	202	100.0	202	100.0	202	100.0

Table 10. Number of Assessments at Each Chronological Age

Chronological Age at Assessment (months)	Number of valid assessments					
	Number of entries at this age	Battelle	HOME	Milani	Teller	Vineland
< 1 mo.	1	1	1	0	1	1
2	2	2	2	1	2	2
3	9	9	9	7	9	8
4	11	10	9	6	8	10
5	13	9	9	1	11	10
Subtotal, 0-5 mos.:	36	31	30	15	31	31

6	17	15	14	5	16	16
7	22	21	19	10	22	20
8	36	34	25	18	29	32
9	23	23	20	7	21	23
10	20	19	17	6	20	16
11	51	40	43	16	46	44
Subtotal, 6-11 mos.:	169	152	138	62	154	151
12	71	55	52	26	50	52
13	20	17	16	6	13	15
14	11	8	10	4	9	7
15	9	7	7	5	6	7
16	2	2	2	0	2	2
17	11	9	8	7	8	8
Subtotal, 12-17 mos.:	124	98	95	48	88	91
18	56	48	49	34	48	51
19	30	26	27	15	25	27
20	13	12	11	7	10	11
21	6	6	5	2	4	5
22	4	3	2	1	2	0
23	4	3	3	3	2	3
Subtotal, 18-23 mos.:	113	98	97	62	91	97
24	57	51	51	28	52	49
25	20	21	21	14	20	19
26	8	8	8	4	7	7
27	4	4	4	2	2	4
28	7	6	6	1	6	5
29	3	3	2	4	3	2
30	4	3	4	0	3	3
31	1	1	1	0	1	1
32	3	3	3	2	3	2
33	1	1	1	0	1	1
34	1	0	1	0	0	1
Subtotal, 24-35 mos.:	109	101	102	55	98	94
36	36	33	32	6	30	30
37	14	14	13	0	11	13
38	4	4	4	0	4	4
39	2	2	2	0	1	1
40	1	1	1	0	1	1
45	1	1	1	0	1	1
46	4	4	2	0	4	3

47	1	1	1	0	1	0
Subtotal, 36-47 mos.:	63	60	56	6	53	53
48	9	9	8	0	9	8
49	4	4	4	0	4	3
50	6	6	5	0	6	4
51	6	6	6	0	6	6
52	1	1	0	0	1	1
53	1	1	1	0	1	1
56	1	1	1	0	1	1
Subtotal, 48-59 mos.:	28	28	25	0	28	24
60	1	1	1	0	0	1
Subtotal, 60-71 mos.:	1	1	1	0	0	1
<b>TOTAL: 643</b>	<b>569</b>	<b>544</b>	<b>248</b>	<b>543</b>	<b>542</b>	

Forty children (n = 40, 19.8% of the total sample) received only one assessment during the project. The majority of these (n = 25, 62.5%) were identified by Project Evaluators as active participants who had entered the study as far back as project year 2. It is not known why these 25 “active” participants received only one assessment, although some single assessments are explained by our decision to exclude assessment data from the database if it occurred within the same age interval as a previous assessment. The 15 other participants who received only one assessment had either moved away (n = 7, 17.5%), withdrawn (n = 5, 12.5%), died (n = 2, 5.0%), or become ineligible for services because the child’s visual impairment had resolved (n = 1, 2.5%).

An additional 7 participants received no assessments, but were included in the database because they had completed permission forms and provided demographic, medical, and/or birth information to the project. Three (3) of these participants had moved away, one had withdrawn, and one had died before any assessments could be conducted. The other two participants were still listed as “active” by the Project Evaluators.

One of the 2 children whose visual impairment resolved during the course of the

study was followed for 6 months prior to withdrawal. The second child was only assessed once. Both children were 12 months old at the time of withdrawal.

### **Parent Assessments**

At the same time as Project Evaluators assessed children, they delivered a packet of additional forms to parents (see Table 3 and Appendices A and B). Parents completed these forms in private and returned them in a business reply envelope directly to the project office. Each questionnaire was stamped with the date received, coded, and filed by child's chronological age at parents' date of completion. A check for \$25.00 was sent to each family each time an assessment packet was received. For many of the same reasons cited above, all information is not available at each age interval (see Table 11). Generally, there are fewer parent assessments available at each age interval than there are child assessments, and once again, the most information is available between the ages of 6-11 and 24-35 months. Some parent assessments appear to drop off in the 18-23 month age interval, but the drop is actually due to a change in procedure approximately two years into the project, when participating parents informed us that the repetition in questionnaires was fatiguing, discomforting, and somewhat annoying. We then eliminated those questionnaires from the 18-23 month age interval. In spite of this change, however, parent completion of assessments dropped off steadily as the children grew older, from a high of 77.8% at age interval 0-5, to a low of 57.1% at age interval 36-47 months. This drop-off was very likely due to the same factors mentioned previously: fatigue, annoyance, and discomfort.

**Table 11. Parent Assessments Obtained at Each Age Interval**

	Assessment Interval								Total
	0-5	6-11	12-17	18-23	24-35	36-47	48-59	60-71	
Family Resource Scale	21	96	93	49	70	36	18	1	384
Functional Status II(R)	24	97	88	78	69	35	17	1	409
Health Questionnaire	23	95	90	76	68	36	17	1	406
Income	17	93	62	52	70	31	17	1	343
Parent evaluation of services	9	40	63	73	67	35	17	1	305
Parenting Stress Index	27	93	81	50	70	36	17	1	375
Public assistance	23	126	75	67	80	34	17	1	423
Temperament Questionnaires	28	97	90	49	70	36	17	1	388
Best rate of parent response	77.8%	74.6%	75.0%	67.3%	73.4%	57.1%	64.3%	100.0%	

**Assessment Duration**

The length of time participants were studied was determined by subtracting the child's age at project entry (i.e., age at first assessment) from child's age at last assessment. For the 155 children (76.7% of the participants) who received more than one assessment by Project Evaluators, the length of time studied ranged from 3.2 months to 46.9 months (mean = 19.1 months, s.d. = 10.4) (see Table 12). The 25th percentile for this group of children was 10.9 months; the 50th percentile was 17.5 months; and the 75th percentile was 26.2 months (see Table 13). By examining these data in 12-month intervals (see Table 14), 29.0% (n = 45) of those who received two or more assessments were followed for 4 months or less; 37.4% (n = 58) were followed between 12.1 and 24 months; 25.2% (n = 39) were followed between 24.2 and 36 months; and 8.4% (n = 13) were followed between 36.1 and 48 months. For all participants, the proportion followed for 12 months or less was 43.6% (n = 85); between 12-1 and 24 months, 29.7% (n = 58); between 24.1 and 36 months, 20.0% (n = 39); and between 36.1 and 48 months, 6.7% (n = 13). Children who entered the study first tended to be followed for longer periods of time, simply because more time was available.

Table 12. Duration of Study Period (in months)

	n	%	Mean	s.d.	Shortest Duration	Longest Duration
Participants with less than 2 assessments	155	76.7	19.1	10.4	3.2	46.9
Active	132	85.2	19.8	10.8	3.2	46.9
Moved	14	9.0	15.2	4.2	3.4	28.6
Deceased	5	3.2	16.2	4.2	10.6	20.8
Withdrew	3	1.9	11.3	5.8	4.9	16.3
Resolved	1	.6			6.0	6.0
Participants with 1 assessment only	40	19.8	1.0		1.0	1.0
Active	25	62.5				
Moved	7	17.5				
Deceased	2	5.0				
Withdrew	5	12.5				
Resolved	1	2.5				
Participants with 0 assessments	7	3.5				
Active	2	28.6				
Moved	3	42.9				
Deceased	1	14.3				
Withdrew	1	14.3				

Table 13. Duration of Study Period for Participants who Received Two or More Assessments

	Participants with less than 2 assessments		
	Active	Non-active	Total
N	132	23	155
Mean	19.8	14.5	19.1
s.d.	10.8	6.2	10.4
25th percentile	11.1	10.5	10.8
50th percentile	18.7	14.3	17.5
75th percentile	26.5	19.1	26.2

Table 14. Duration of Assessment, in 12-Month Intervals

	less than 1 assessment		less than 2 assessments	
	n	%	n	%
12 months	85	43.6	45	29.0
12.1-24 months	58	29.7	58	37.4
24.1-36 months	39	20.0	39	25.2
36.1-48 months	13	6.7	13	8.4
	195	100.0	155	100.0