The Early Learning Accomplishment Profile Edition

Examiner's Manual & Technical Report

Kaplan Early Learning Company
Chapel Hill Training Outreach Project

The
Early Learning Accomplishment Profile (Early LAP)
Examiner's Manual
and
Reliability and Validity Technical Report

by

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and
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Chapter 1
Components of the
Early Learning Accomplishment Profile (Early LAP)

Purpose

The Early Learning Accomplishment Profile (Early LAP) provides a systematic method for observing children functioning in the birth to 36 month age range. The purpose of this criterion-referenced assessment is to assist teachers, clinicians, and parents in assessing individual skill development in six domains of development: gross motor, fine motor, cognitive, language, self-help, and social emotional. The results of the Early LAP can be used to generate a complete picture of a child's developmental progress in the six domains so that individualized, developmentally appropriate activities can be planned and implemented. This assessment can be used with any infant and toddler, including children with disabilities.

As a criterion-referenced assessment, the Early LAP neither assigns a diagnostic label nor yields statistically precise measures regarding a child's level of functioning. It is not a standardized test. The information generated by the Early LAP can be used in conjunction with norm-referenced assessments such as the Bayley Scales of Infant Development–Second Edition, BSID-II, (Bayley, 1993) when determining whether or not a child has a disability. In other words, it should not be used as the sole criterion to place a child in disablilities services. Rather, it should be used as supporting evidence in combination with other instruments that are norm-referenced.

History of the Early LAP

In 1969, the Chapel Hill Training Outreach Project was established. The primary focus of the early years of the organization was to develop methods and materials for the effective demonstration of high quality services to young children with disabilities and their families. The Learning Accomplishment Profile (LAP) was developed during this time. This assessment instrument was drawn from normative-based measures for children birth to six years old.

As early childhood programs expanded their services to younger children, including children with more severe disabilities, a need for a similar instrument designed specifically for infants and toddlers was indicated by those working in the field. Subsequent to this request, the first version of the Early LAP was developed. The Early LAP maintained the format of the original LAP with an increased number of developmental milestones in the birth to three-year-old age range.

In 1974-75, the Director of the Chapel Hill Training Outreach Project enlisted the services of Patricia Griffin, who joined the staff as a research assistant to collect, sequence, and organize additional developmental data. The resulting product, the Infant LAP, was designed to facilitate programming for children with more involved disabilities by parceling the developmental sequence into smaller steps.

In 1978-79, Elayne Glover, assisted by Jodi Preminger, assumed responsibility for the generation of a new version of the Learning Accomplishment Profile for children with typical and atypical development who were functioning in the birth to three-year-old developmental range. The result of their work was the current Early LAP. Additional revisions of the Early LAP were made in 1988 and 1995 to clarify administration procedures, material requirements for each item, and scoring criteria.

Sources for Early LAP Items

Items in the Early LAP were drawn from the work of 21 early childhood researchers and the following assessment instruments. Each Early LAP item is coded according to these original sources as depicted in Table 1.

Table 1. Original Sources for Early LAP Items

Reference Code	Title of Instrument	Author
BAY	Bayley Scales of Infant Development	Bayley, Nancy
BRA	Learning and Growing: A Guide to Child Development	Braga, Laurie and Joseph
CAP	The First Twelve Months of Life: Your Baby's Growth Month-By-Month	Caplan, Frank (Ed)
CAT	The Measurements of Intelligence of Infants and Young Children	Cattell, Psyche
CRAT	Teaching Motor Skills	Cratty, B.J.
DOLL	Preschool Attainment Record	Doll, Edgar A.
EPH	Enrichment Project for Handicapped Infants Hawaii Early Learning Guide	School of Public Health of Hawaii
FRA	Denver Developmental Screening Test	Frankenburg, W.K. and Dodds, J.B.
GES	The First Five Years of Life: A Guide to the Study of Preschool Child	Gesell, Arnold L.
G & A	Developmental Diagnosis: Normal and Abnormal Child Development	Gesell, Arnold L. and Armatruda, Catherine A.
HUR	Child Development (5th ed.)	Hurlock, Elizabeth B.
ILL	The Development of the Infant and Young Child	Illingworth, R.S.
K & P	Gesell and Armatruda's Developmental Diagnosis (3rd ed.)	Knoblock, Hilda and Pasamanick, Benjamin (Eds.)
MCDI	Minnesota Child Development Inventory	Ireton, Harold R. and Twing E.J.
MER	Merrill-Palmer Scale	Stutsman, Rachel
REEL	Receptive-Expressive Emergent Language Scale	Bzoch, Kenneth R. and League, Richard
SHER	The Developmental Progress of Infants and Young Children	Sheridan, Mary D.
SLO	Slosson Intelligence Test	Slosson, Richard L.
STAN-BIN	Stanford-Binet Intelligence Scale	Terman, Lewis M. and Merrill, Maud A.
TER	Measuring Intelligence	Terman, Lewis M. and Merrill, Maud A.
VA STATE PLAN	A Comprehensive State Plan for the Education of Young Handicapped Children Below Age 5	Virginia State Department of Education, Division of Special Education

Early LAP Assessment Materials

Four types of materials are included with the Early LAP: the Early LAP manual, the Early LAP Scoring Booklet, the props needed to administer each item, and the Early Learning Activity Cards. The Early LAP manual forms the core of the assessment. Each of these materials is described below.

Early LAP Manual

The Early LAP manual includes a list of materials, instructions for administering individual items, a summary page, an IFSP form, and a profile page. A sample assessment page from the manual and an explanation of the format are located on page 4 of this report.

Early LAP Scoring Booklet

Scoring booklets that accompany the Early LAP can be used for recording the results of the assessment. The scoring booklet contains an abbreviated form of each item name in the same sequential order as the manual and space for scoring pre- and post-assessment results, a comment column, and a developmental profile. ***The Early LAP scoring booklet is NOT an assessment instrument. It must be used in conjunction with the Early LAP Manual which contains the procedures, materials needed, and scoring criteria for each item.***

Administration Materials

The materials needed for the administration of the Early LAP are described for each item. A complete list for the entire assessment is located on pages 99-101 of the Early LAP Manual. The dimensions of many items are specified, although the items do not have to meet the exact measurements. For example, a 4" ball may be substituted for a 5" ball. The materials can be gathered by the examiner, or for more consistent results, a standard Early LAP Kit can be purchased from the publisher, Kaplan Early Learning Company. The Early LAP Kit includes all of the necessary materials (except large items such as furniture or stairways). If the kit is not being used, it is necessary to review this list and collect the needed items before the assessment session.

Early Learning Activity Cards

The Early Learning Activity cards are a set of 414 sequential cards correlated with the Early LAP, one card for each item in the six domains. Each card presents one or more activities focused on a specific developmental skill from the Early LAP (see Appendix for example).

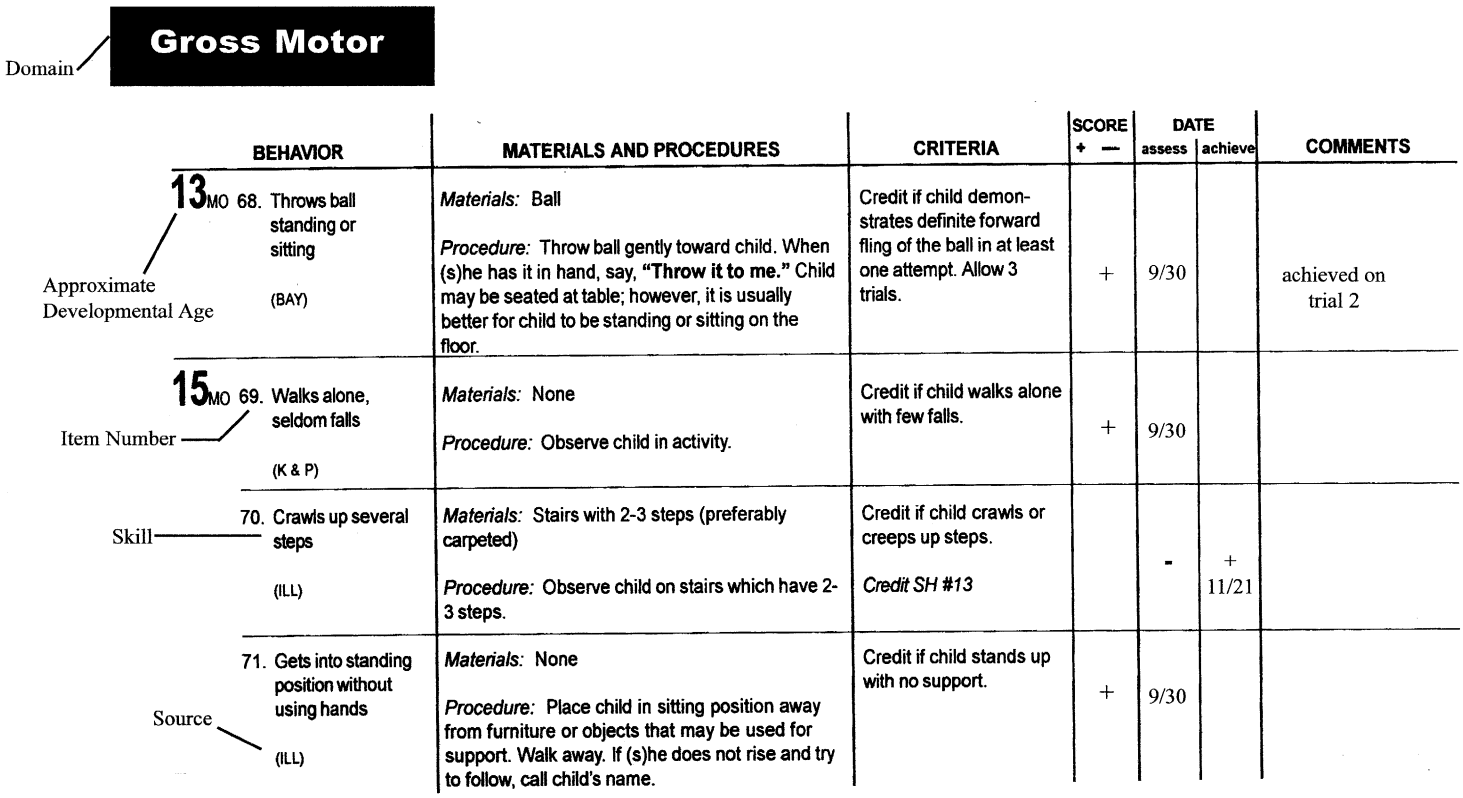
Structure of Early LAP

The Early LAP contains a hierarchy of developmental skills arranged in chronological sequence in six domains of development:

- Gross Motor
- Fine Motor
- Cognitive
- Language
- Self-Help
- Social Emotional

A sequential list of the assessment items is located at the beginning of each domain. The developmental age range is indicated on the left side of the item list. The assessment begins on the page immediately following the item list. The organization of the Early LAP pages is illustrated in Figure 1 and described on the following page.

Figure 1. Organization of Early LAP Assessment Page



The developmental domain (e.g., gross motor) is indicated at the top of each page. The instructions for the materials, procedures, and criteria for each item are only contained in the assessment manual.

Developmental Age Range — The approximate developmental age range is indicated left of the first item for each age range.

Behavior — Each item is numbered and described. The initials in parentheses below the item refer to the original source as described in the previous section.

Materials/Procedures — The materials and procedures column has two parts. All materials needed to administer the item are listed above the procedures. Many of these materials are in the Early LAP kit. Furniture and other large items not included in the kit are listed also. The procedures for administering each item are located below the list of materials. Spoken words or phases are in bold and should be followed as closely as possible. Following the procedures as described will help ensure the validity of the assessment results.

Criteria — The criteria column provides information for determining whether responses should be credited. These criteria should be used in determining whether or not the child has successfully completed the task.

Score — A score indicating the child's success or failure of the item should be recorded in this column. A plus (+) is used for items successfully completed. A minus (-) is used when the child does not meet the item's criteria.

Date — Two subheadings are located in the date column to enable the examiner to follow the child's progress on mastering the measured skills. The first subheading "assess" should be used to record the date of the initial assessment. The second date column "achieve" may be used to record when the child successfully completes an item missed previously. You may also wish to add a plus in the score column as well.

Comments — A space is provided for specific comments regarding the particular item. Explanations of any modification of procedures, questions about the appropriateness of an item for a specific child, or use of adaptive equipment/materials should be explained in this column. This information is critical for examination of individual strengths and needs.

Additional tools are located in the back of the Early LAP Manual to assist the examiner in using the Early LAP and summarizing assessment results. These tools include: materials needed for the assessment, a bibliography of citations of the Early LAP sources, a form to indicate observational notes from the assessment, an IFSP form, and a developmental profile form of Early LAP results.

Chapter 2
Test Administration Guidelines

The first section of this chapter provides information about factors to consider when administering the Early LAP. Additional sections provide detailed guidance for computing the child's chronological age in months, scoring procedures, and guidelines for completing the developmental profile.

Test Administration Considerations

A variety of issues should be considered to help ensure that the overall results reflect an accurate picture of a child's level of functioning for each developmental domain. Several factors that are important to consider during the administration of the Early LAP are described below.

Administration Time

The length of time for administering the Early LAP depends on a variety of factors such as the experience of the examiner, the age of the child, the child's behavior and/or attention span, the environment, and the method of assessment. Generally, an experienced examiner can complete all six domains in about one hour. However, seldom can all domains be administered to a child in a single session due to the limited attention span of very young children. Most assessment sessions should be limited to twenty to thirty minutes. The child should be provided a break, change of activities, and/or extended time interval between sessions. Because maximum performance of the child is sought, the examiner should be careful to end a session if the child becomes inattentive or severely distracted. However, the examiner should attempt to complete the domain being administered before ending the session.

Physical Setting

Ideally, the environment for assessment should be a quiet, well-lit room free of distractions. Toys or other objects should be out of the child's reach. If it is necessary to conduct the assessment in a room where other activities are in progress, a screen could be placed between the child and the other children in an effort to minimize distractions. Because some gross motor items require the child to hop, jump, walk, or throw a ball, the examiner should make sure there is adequate room to perform these activities. Also, some items in the gross motor domain require access to large items such as stairways or a balance beam.

Arrangement of Materials

The assessment kit should be placed out of view of the child to minimize distractions. The examiner should check the materials prior to the assessment to see that all materials are in place, including consumable paper supplies. When the assessment is complete, the examiner should be careful to return materials to the Early LAP kit.

Establishing and Maintaining Rapport

First and foremost, time should be taken to establish a comfortable rapport with the child. Putting the child at ease and reducing the anxiety which might accompany an assessment session should be a primary objective of the examiner. Only if the child is comfortable with the examiner can the child be expected to perform to the best of his or her ability. For infants, the examiner should engage in a period of friendly interactions with the child and check that the child has been fed and changed. Make sure the assessment is being administered at the best time of day for the child when he or she is likely to be most alert. For older children, the examiner should introduce himself or herself, play with the child, and talk with the child about the types of activities (e.g., build with blocks, run and jump, look at book) before starting the assessment. Encouraging the child to play with the toy cars or other materials may be necessary to establish rapport and help the child to relax. Remember, eye contact while giving instructions helps maintain the child's attention.

The examiner should attempt to establish a relaxed but active pace. An assessment session can be ruined by slowing it down so much that you lose a child's attention or by rushing too quickly through activities so that you do not give a child enough time to demonstrate his or her abilities. Adequate preparation is a key to maintaining interest and attention. Fumbling with materials, reading instructions to yourself, and searching for items are certain ways to lose the interest of the child. The examiner must always maintain control of assessment activities. If you should find you are losing a child's attention, speed up the pace slightly.

In cases where the child is getting tired or showing little attention, it is best to complete the current domain and continue the assessment at a later time. Take caution not to show frustration or displeasure toward the child but indicate that the assessment will be continued later (e.g., the afternoon, the next day). *Obvious inattentiveness or distraction of the child should be noted in the comment column and in the Summary of Observations/Recommendations of the Early LAP Manual or Scoring Booklet.*

Avoiding Cues

The examiner should be careful not to give cues to the child. Avoid the use of phrases such as, "*That's right,*" or "*Now here's a hard (or easy) one,*" or similar phrases. Avoid body language such as nods, frowns, or smiles at the time a child achieves (or fails) a task, which can give undesired feedback. Phrases such as, "*You're working hard!*" or "*Can you think of anything else?*" give encouragement, but avoid inappropriate cues. Examiners must be especially careful to avoid teaching items inadvertently. The examiner should encourage the child in order to obtain maximum performance but should avoid the tendency to prompt children for responses.

Following Procedures

The reliability of assessment with the Early LAP is dependent upon the examiner following the explicit instructions in the Early LAP Manual. The examiner should read all item procedures and criteria prior to administration of an item. The examiner should be careful to say the verbal instructions *exactly* as written in the manual. Verbal instructions to the child are always preceded by "*Say*" with the specific verbal instructions in quotations and bold type. The examiner should say the verbal instructions clearly with sufficient enthusiasm, maintain eye contact with the child, and avoid monotonous reading of instructions to young children.

Computing Chronological Age

The child's chronological age must be calculated to determine the appropriate starting point in each domain. Before beginning the assessment, the chronological age should be converted into months using the following rules.

Computation Process

1. Using the left side of the cover page of the Scoring Booklet Record (called Pre Assessment), write the date of assessment and date of birth in standard form as indicated.

2. Use the space to the right of this area to convert dates for computation. To convert both the date of assessment and date of birth, re-enter the same information in the following sequence: year, month, day. For example, the date 12/25/98 is rewritten 98/12/25.

3. To calculate the chronological age in months, subtract the date of birth from the date of assessment, beginning on the right with the "day" column. Then move to the middle column, "months," and then the column on the left, "years."

4. If the calculation is not possible without "borrowing," ALWAYS borrow these amounts:
   --When borrowing a month, borrow 30 days
   --When borrowing a year, borrow 12 months

5. Then complete the calculation by multiplying the number of years by 12 (to convert to months) and adding the number of months from the month and day rows. Add one additional month to the total, if the days are 15 or more. For an example, see Figure 2.

Figure 2. Calculating Chronological Age

	Standard Dates	**Converted Dates**
		6 44
Date of Assessment:	7 / 14 / 00	00 /~~7~~ / ~~14~~
Date of Birth:	4 / 16 /98	98 / 4 / 16
		2 / 2 / 28

Year: 2 years x 12 =	+	24 months
Month: enter months =	+	2 months
*(Day: Add 1 month =	+	1 month
ONLY if day is 15 or more)		
CHRONOLOGICAL AGE		27 **months**

Determining Starting Points

Once the chronological age for a child has been converted into months, the starting point for each domain should be determined. The starting point is the first item in the same developmental age range as the child's chronological age. If there are no items for that age, the first item in the developmental age range prior to the child's chronological age should be used as the starting point.

Determining Starting Points for Children with Disabilities

In the case of children with disabilities, the reports of screening and/or professional diagnostic results are used to provide specific information regarding the individual child's developmental level of functioning. This information should form the basis for determining the appropriate point for beginning the assessment process. If this information is not available, begin administering the assessment at half of the child's chronological age, which would probably allow for the establishment of a basal.

Scoring Procedures

If the child meets the criteria of an item, a plus (+) should be recorded to indicate the presence of the criterion-referenced behavior. A minus (-) is recorded if the skill is not demonstrated by the child. Examiners must adhere to the following rules to establish an appropriate basal, ceiling, and approximate developmental age. Remember, this is a criterion-referenced assessment. Although an approximate developmental age can be calculated for each domain, it should not be used as the sole criteria to diagnose a child for early intervention services. Rather, it should be used as supporting evidence in conjunction with other instruments that are norm-referenced. Table 2 depicts the basal and ceiling criteria.

Table 2. Basal and Ceiling Criteria for Early LAP

Basal	8 consecutive items successfully completed
Ceiling	3 errors out of 5 consecutive items

Basal Rules

1. Because it is important that the child establish a basal (or initial level of successful functioning), the positive demonstration of **eight** consecutive behaviors has been designated as the basal for the *Early LAP.*

2. If the child fails to demonstrate a specific skill, the assessor should work backwards on the task hierarchy until the basal of eight consecutive items is established.

3. If a basal cannot be established because the child is too young to administer the first eight items, use the first item in that domain as the basal.

   Figure 3 provides an example of establishing a basal on the Early LAP.

Figure 3. Determining the Basal

Cognitive		Score		Date		Comments
		+	-	assess	achieve	
30 months	87. Shows or tells use of one or more familiar objects on request	+				
	88. Names or identifies objects by use	+				
	89. Builds tower of 8 cubes	+				
	90. Points to 7 pictures	+				
	91. Names 5 pictures on a picture card when asked, "What is this?"	+		**Basal**		
	92. Imitates cross	+				
	93. Gives full name	+				
33 months	94. Names or points to self in photograph	+				
	95. Responds correctly to "Show me one block (or finger)"		-			
	96. Builds tower of 10 cubes	+				
	97. Imitates "bridge" of cubes		-			

Ceiling Rules

1. After the basal has been determined, the assessment should continue until the child accumulates **three minuses in a five-item sequence.** This defines the child's ceiling level of performance. The assessment should end at this point.

2. If the child has established a basal and successfully completes all items in a domain without accumulating three minuses out of five consecutive items, use the last item of that domain as the ceiling cut off.

Figure 4 provides an example of a ceiling on the Early LAP.

Figure 4. Determining the Ceiling

Cognitive		Score		Date		Comments
		+	-	assess	achieve	
30 months	87. Shows or tells use of one or more familiar objects on request	+				
	88. Names or identifies objects by use		-			
	89. Builds tower of 8 cubes	+				
	90. Points to 7 pictures	+		Ceiling		
	91. Names 5 pictures on a picture card when asked, "What is this?"		-			
	92. Imitates cross		-			
	93. Gives full name					

Additional Scoring Rules

1. A number of items on the Early LAP are cross-referenced between domains. For example, item number FM 54 is the same as item number C 68. Because these items are exactly the same, the score for an item in one domain that is cross-referenced to another domain should be automatically given in the second domain. Therefore, if a child receives a plus (+) for successfully completing FM 54, the child also should receive credit for C 68.

2. If the examiner administers an item and the child refuses to attempt it, the score should be recorded as a minus (-) with the word "refused" written in the comment column.

3. If the examiner cannot administer an item because the material is not available (e.g., a stairway) or some other extenuating circumstance, this should be noted in the comment column. However, it is important to recognize that such missing information compromises the ability of the assessment to provide an accurate overall picture of the child's skills and should be acknowledged in subsequent uses of the assessment information for individual planning.

Computing Raw Scores

All items prior to the basal are counted as correct. The raw score represents these items plus the number of items successfully completed in a given domain up to the ceiling. In any use of the information generated by the Early LAP assessment, it is important to be aware that the normative developmental age assigned to a specific item often varies among reputable research-based sources. Therefore, while the Early LAP data reflect documented norms, it is essential that the developmental ages be viewed as approximate in nature.

After the ceiling has been obtained for a specific domain, the examiner should compute the raw score for a domain using the following rules.

1. After the ceiling is obtained, write the item number (NOT the developmental age) of the last item of the ceiling (e.g., third item with minus out of five consecutive items) at the bottom of the domain in the row labeled "Number of last item of the ceiling."

2. Count the number of errors or minuses between the basal and ceiling and enter this number at the bottom of the domain in the row labeled "Subtract (minuses between basal/ceiling)."

3. Subtract the number of errors in the second line from the ceiling item in the first line and enter the result on the line labeled "Raw Score." This is the child' s raw score for that domain.

Determining the Approximate Developmental Age

Using the raw score for a developmental domain, locate the corresponding item number in the same domain. The age range where this item number is located is the approximate developmental age of the child for that domain. For example, a child with a raw score of 40 in Fine Motor is approximately functioning in the 12-month developmental age range. An example of the process for computing the raw score for a domain and determining the approximate developmental age is shown in Figure 5.

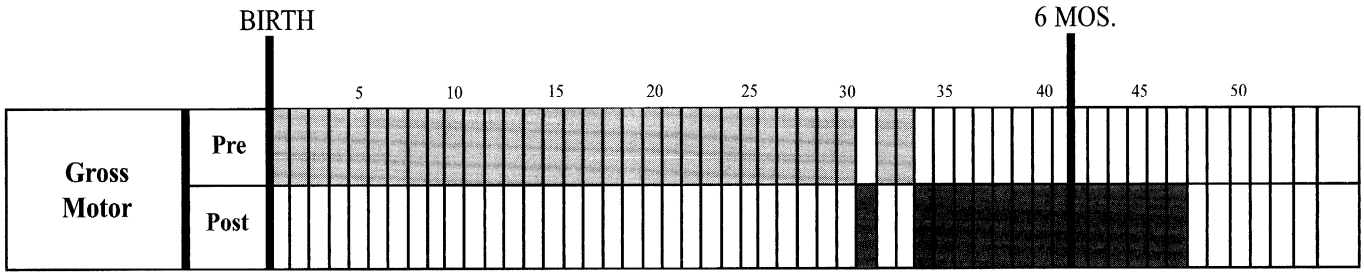
Figure 5. Computing Raw Scores and Determining the Approximate Developmental Age

Cognitive		Score		Date		Comments
		+	-	assess	achieve	
30 months	87. Shows or tells use of one or more familiar objects on request	+				
	88. Names or identifies objects by use	+				
	89. Builds tower of 8 cubes	+				
	90. Points to 7 pictures	+				
	91. Names 5 pictures on a picture card when asked, "What is this?"	+		**Basal**		
	92. Imitates cross	+				
	93. Gives full name	+				
33 months	94. Names or points to self in photograph	+				
	95. Responds correctly to "Show me one block (or finger)"		-			
	96. Builds tower of 10 cubes	+				
	97. Imitates "bridge" of cubes		-			
36 months	98. Copies Circle	+				
	99. Adapts to form board reversal	+		**Ceiling**		
	100. Adds 2 parts to incomplete person		-			
	101. Points to small details in pictures		-			
	102. Names 8 pictures correctly					
	103. Understands 3 prepositions					
	104. Joins in nursery rhymes and songs					
	105. Answers correctly "Are you a boy or a girl?"					
	Number of last item of the ceiling	101				
	Subtract (minuses between basal/ceiling)	4				
	Raw Score	97				
	Approximate Developmental Age	33 months				

Early LAP Profile

For a visual representation of the child's developmental profile, use the bar graph on page 111 of the Early LAP Manual. After the initial assessment, color the appropriate spaces corresponding to the behaviors of the child achieved in the row labeled **PRE** (intervention). Space corresponding to the behaviors not yet achieved should be left blank. As the child demonstrates accomplishment of a specific behavior, use a contrasting color to indicate acquisition of the skill item in the appropriate space in the row labeled **POST** (intervention). Figure 6 depicts an example of the method for using the Early LAP Profile.

Figure 6. Completing the Early LAP Profile



It is the responsibility of the child's caregivers and/or teachers to analyze each item to ascertain its appropriateness for individual children. An item's relevance is determined by the child's environment, current developmental skill level, and implications for future skill development.

Using the Scoring Booklets

Early LAP scoring booklets MUST be used in conjunction with the Early LAP Manual since the procedures, materials, and assessment criteria are located only in the manual. The rules described above also apply to the scoring booklet (e.g., calculating the chronological age, determining the starting point in each domain, establishing a basal and ceiling, and calculating a raw score). The scoring booklet contains an abbreviated form of each item name in the same sequential order as the manual. It also has an Early LAP profile on the back of the booklet, which should be used in the same manner as the profile on the manual.

Chapter 3
The Early LAP Reliability and Validity Study: Methodology and Procedures

Project Description

To date there is little written information about the reliability and validity of the Early LAP, even though it has been successfully used across the United States since the 1970s. The purpose of this research was to examine and document the reliability and validity of the Early LAP. Three types of studies were conducted:

- Criterion Validity–the extent to which individual scores on the Early LAP correspond with scores on a similar test. Both the Early LAP and the Bayley Scales of Infant Development (BSID-II) were administered to the same child in the same or consecutive sessions.

- Test-Retest Reliability–the extent to which scores on the Early LAP are consistent from one period of time to the next. The Early LAP was administered and then re-administered to the same child on two different occasions by the same examiner one to three weeks apart.

- Interrater Reliability–the extent to which different examiners achieve the same results when independently assessing the same child using the Early LAP. The Early LAP was administered and then re-administered to the same child by two different examiners one to three weeks apart.

In addition, these data were used to calculate other statistical properties of the Early LAP, including correlations between developmental age scores and chronological age, internal consistency, standard errors of measurement, and construct validity. The results of a separate content validity study (Fleming, 2000) are also reported in Chapter 4. Descriptions of the sample and data collection procedures for this Reliability and Validity Study Project are included below.

Sample Description

To investigate the reliability and validity of the Early LAP, a sample representative of the United States was selected based on population projections for the Year 2000 by the U.S. Census Bureau (1995). The sample included 285 children ages 2 to 44 months old, including children with typical and atypical development. A stratified sampling procedure was used based on geographic region, age, race, gender, and type of setting.

Geographic Distribution of Project Sites

Four sites were selected to represent the geographic regions of the United States with similar sample sizes in each region: Northeast (New York City and Westchester County, New York), South (Orange County, North Carolina), North Central (Greater Metropolitan Area of Kansas City and Lawrence, Kansas), and West (San Jose, California). Table 3 depicts the distribution of the sample across the four sites.

Table 3. Geographic Distribution of Sample

Geographic Area	Number of Children	Percentage of Sample
Northeast	59	20.7%
South	68	23.9%
North Central	81	28.4%
West	77	27.0%
Total	285	100%

Age

Children from 2 to 44 months were selected for the study in the following seven categories: birth to 6 months, 7-12 months, 13-18 months, 19-24 months, 25-30 months, 31-36 months, and 37-44 months. Children in the last category, 37-44 months, were included to demonstrate the upper age limit for the Early LAP. Table 4 shows the distribution of the Project Sample by age category and geographic region.

Table 4. Number of Participants by Age and Geographic Region

Age	Northeast	South	North Central	West	Total
Birth-6 months	0	7	16	12	35 (12.3%)
7-12 months	6	14	13	11	44 (15.4%)
13-18 months	11	10	12	12	45 (15.8%)
19-24 months	16	9	14	11	50 (17.5%)
25-30 months	10	11	8	12	41 (14.4%)
31-36 months	5	8	14	13	40 (14.0%)
37-44 months	11	9	4	6	30 (10.5%)
Total	59	68	81	77	285 (100%)

Gender

An approximately equal number of males and females were selected for the sample. The distribution of the Project Sample by gender and geographic region is indicated in Table 5.

Table 5. Number of Participants by Gender and Geographic Region

Gender	Northeast	South	North Central	West	Total
Female	18	32	40	35	125 (43.9%)
Male	41	36	41	42	160 (56.1%)
Total	59	68	81	77	285 (100%)

Race/Ethnicity

To represent the variety of cultural and ethnic groups in the United States, children were proportionally selected for the sample to reflect the major racial/ethnic groups indicated in the U.S. Census Bureau population projections for the Year 2000 (1995). These groups included the following categories: African American; American Indian, Eskimo, and Aleut; Asian and Pacific Islander; Hispanic origin; and White. In addition, an Other category included mostly bi-racial children who were categorized in this group by their parents. Table 6 depicts the racial/ethnic distribution by geographic region.

Table 6. Number of Participants by Race/Ethnicity and Geographic Region

Race or Ethnic Group	Northeast	South	North Central	West	Total**
African American	23	8	20	6	57 (20.0%)
American Indian, Eskimo, and Aleut	2	0	2	1	5 (1.8%)
Asian and Pacific Islander	1	1	1	5	8 (2.8%)
Hispanic origin	10	3	1	13	27 (9.5%)
White	15	52	50	52	169 (59.3%)
Other*	8	4	7	0	19 (6.6%)
Total	59	68	81	77	285 (100%)

*The majority of the children classified as Other were bi-racial children.

*The 1995 U.S. Census Bureau population projections for Year 2000 were: African American-13%; American Indian, Eskimo, and Aleut -1%; Asian and Pacific Islander-4%; Hispanic origin-11%; and White-71%

Program Types

Because the Early LAP is used for in-home services as well as in group settings for infants and toddlers, children were recruited from three different settings; child care center programs (N=179, 62.8%); Early Head Start programs (N=37, 13.0%); and individual homes (N=69, 24.2%). Thus, the majority of the children participating in the study were assessed in a child care program (N=216, 75.8%). Of the children who were included from individual homes, 65.2% were located in the West, 29% were located in the North Central site, 5.8% were located in the South, and none in the Northeast. A total of 29 child care programs participated in the study, with some variation in the types of centers across the four geographic regions. The Northeast site (New York City and Westchester County, New York) included four Early Head Start centers, one developmental day center (centers serving only children with disabilities), one YMCA child care facility, and four community day care centers. In the South (Orange County, North Carolina), six community child care centers, one Early Head Start, and one developmental day center participated in the study. The participants in the North Central site (Greater Metropolitan Area of Kansas City and Lawrence, Kansas) included five community day care centers and one center located on an American Indian college campus. The site in the West (San Jose, California) included one developmental day center, a perinatal unit in a substance abuse program, and three community child care centers.

Children With Disabilities

Because the Early LAP is frequently used in conjunction with standardized instruments to examine the skill development of infants and toddlers with developmental delays, a subsample of children with disabilities (6%) was selected that reflected the U.S. rates for children under age 18 with disabilities (U.S. Census Bureau, 1995). These children had been professionally diagnosed and were receiving early intervention services. Where possible, appropriate adaptations in the use of materials and procedures were used to allow children to respond to test items independent of their particular impairment (e.g., use sign language for hearing impaired children, use adaptive equipment for children with limited mobility). It is important to note that older children functioning in the birth to age three range may benefit from the information gathered through the Early LAP.

Characteristics of the Project Sample and Core Sample

The Project Sample (N=285) included children with typical and atypical development from 2-44 months old (Mean = 21.28, SD = 11.29), distributed across the seven age categories as described in Chapter 3. As stated earlier, the oldest age group (37-44 months) was included to demonstrate that the Early LAP is not appropriate for older children (unless they are functioning below their chronological age). Of the 26 children in the oldest age group with typical development, the mean developmental age scores for each domain ranged from 35.0 to 48.6, with an average of 81% of the children completing the assessment before reaching a ceiling in the domain, confirming that the Early LAP is not an appropriate instrument for children with typical development above 36 months of age.

To establish a Core Sample of children with typical development in the birth to 36 month age range, the scores of children in the oldest age group (37- 44 months old) and the children with professionally diagnosed disabilities were excluded. Thus, the resulting Core Sample (N=242) was comprised of children with presumedly typical development from 2-36 months old (Mean = 18.97, SD = 9.77). Table 7 presents the means and standard deviations for the Early LAP developmental age domain scores and for each of the age categories in the Project Sample and Core Sample.

Table 7. Means and Standard Deviations of Early LAP Developmental Age Domain Scores by Chronological Age Clusters for Project Sample and Core Sample

Domain / Chronological Age Clusters	Project Sample*		Core Sample**	
	Mean	Standard Deviation	Mean	Standard Deviation
Gross Motor				
Birth-6 months	4.41	1.65	4.45	1.66
7-12 months	10.44	3.42	10.95	2.90
13-18 months	17.61	5.64	17.88	5.41
19-24 months	24.53	1.65	25.05	5.24
25-30 months	29.68	6.03	29.51	6.02
31-36 months	32.00	7.75	33.56	4.48
37-44 months	34.11	4.79	--	--
Fine Motor				
Birth-6 months	4.76	2.05	4.78	2.08
7-12 months	10.34	2.40	10.73	1.94
13-18 months	16.05	3.08	16.16	2.96
19-24 months	22.56	4.64	22.91	4.46
25-30 months	28.49	5.08	28.60	5.09
31-36 months	31.45	7.49	33.35	3.60
37-44 months	34.10	3.82	--	--
Cognitive				
Birth-6 months	5.03	1.69	5.03	1.69
7-12 months	10.19	2.38	10.48	2.14
13-18 months	15.60	3.66	15.77	3.51
19-24 months	22.62	4.50	22.69	4.59
25-30 months	28.53	5.75	28.81	5.55
31-36 months	32.51	7.09	34.37	2.94
37-44 months	34.30	3.91	--	--
Language				
Birth-6 months	5.00	1.26	5.03	1.27
7-12 months	9.98	3.28	10.28	3.13
13-18 months	16.36	4.53	16.60	4.29
19-24 months	22.96	5.85	23.41	5.60
25-30 months	28.66	6.82	29.19	6.07
31-36 months	32.31	7.86	34.20	3.93
37-44 months	33.70	4.64	--	--

Domain / Chronological Age Clusters	Project Sample*		Core Sample**	
	Mean	Standard Deviation	Mean	Standard Deviation
Self Help				
Birth-6 months	6.78	.67	6.78	.67
7-12 months	12.58	2.69	12.76	2.53
13-18 months	16.69	3.05	16.80	2.99
19-24 months	23.19	5.16	23.61	4.96
25-30 months	28.37	5.46	28.65	5.25
31-36 months	32.53	6.43	33.77	5.06
37-44 months	45.79	12.13	--	--
Social Emotional				
Birth-6 months	4.61	1.61	4.61	1.61
7-12 months	10.32	3.08	10.63	2.92
13-18 months	17.45	7.24	17.62	7.26
19-24 months	28.03	7.47	28.67	6.91
25-30 months	31.97	5.80	32.50	5.02
31-36 months	33.03	7.63	34.96	2.88
37-44 months	36.00	.00	--	--

*Project Sample N= 285 (2 - 44 months old with typical and atypical development)

**Core Sample N=242 (2-36 months old with typical development)

Procedures

The data were collected by a team of nine professionals trained and supervised by the project co-directors. Each examiner had a master's or doctoral degree in education, early intervention services, or another related field. The examiners attended a two-and-a-half day training session on the Early LAP, BSID-II, and procedures for data collection in the fall of 1999.

A total of 285 children participated in the study with approximately equal numbers of children recruited from each geographic region. Within each site, children were recruited from child care centers and individual families. An effort was made to include settings representing children from a range of socioeconomic groups. Each center director, or parent in the case of home settings, was contacted by phone and invited to participate in the study. Copies of the Early LAP manual and letters describing the study and requesting consent to participate were shared and discussed during a subsequent meeting. In the case of child care and Early Head Start programs, each center director agreed to distribute and collect permission forms for parents interested in participating in the study.

The data were collected from November, 1999 to July, 2000. After the children were recruited, each examiner was responsible for scheduling assessment visits with center directors or individual families within home settings, completing the assessments, and submitting completed protocols to the project co-directors.

After the data collection was completed, the individual item scores were entered into a database. Once all data had been entered, each item was verified against the original protocol independently by two different individuals, and all errors were reconciled and corrected in the database. An analysis data set based on the final database was then programmed in SAS 8.1 and then converted into SPSS 8.0. Statistical analyses were generated in SPSS 8.0 for each component of the study.

Chapter 4
Statistical Properties of Early LAP

Reliability

The reliability of an assessment instrument refers to its accuracy and consistency over time. For example, an assessment instrument should produce roughly the same results when the same individuals are tested under similar conditions within a short period of time. Analyses of the reliability for each domain of the Early LAP, including correlations with age, internal consistency, standard error of measurement, test-retest reliability, and interrater reliability, were conducted. Although children were recruited for the sample in 6-month increments of age, for purposes of analysis the data were collapsed into 12-month increments to ensure sufficient sample sizes in each cell. Every effort was made to gather complete data for each child, however, in some cases there were missing items that prevented calculation of a domain score. In most cases, the missing data were caused by the inability to observe particular behaviors due to the inaccessibility of large materials (e.g., furniture, stairway) or a restricted number of test items in a developmental range (e.g., self-help begins at six months and social emotional has a limited number of items for some age ranges).

Correlations Between Chronological Age and Developmental Age Scores

The correlations between the Early LAP developmental age scores and chronological age were computed for the Core Sample (children with typical development in the birth to 36 month age range) using Pearson product-moment correlation coefficients (r). Table 8 presents the correlation coefficients by domain and age group. These results indicate strong correlations (.90 to .95) between chronological age and developmental age in each domain for the overall sample. Within age groups, correlations for the 2-12 month old age range (.80 to .91) and the 13-24 month old age range (.63 to .73) also indicate strong relations between chronological age and developmental age for each domain. The correlations for the 25-36 month old age range (.31 to .61) are moderate. These findings suggest that the developmental age scores on the Early LAP are reliably associated with chronological age for younger children, but that the association decreases somewhat as children become older and begin to age out of certain items and/or domains on the test.

Table 8. Correlations Between Chronological Age and Developmental Age Scores by Domain and Age Group

DOMAINS	2 months to 12 months[a]	13 months to 24 months[b]	25 months to 36 months[c]	Total[d]
Gross Motor	.88	.63	.45	.91
Fine Motor	.91	.72	.51	.94
Cognitive	.92	.73	.61	.95
Language	.82	.70	.43	.92
Self-Help	.80	.73	.60	.91
Social Emotional	.85	.68	.31	.90

Note: For all correlations, p <. 01 N: a (GM=73, FM=73, C=73, L=68, SH=47, SE=69) b (GM=85, FM=86, C=88, L=87, SH=85, SE=75) c (GM=71, FM=74, C=72, L=72, SH=68, SE=57) d (GM=229, FM=233, C=233, L=227, SH=200, SE=201)

Internal Consistency

The internal consistency of the Early LAP was examined to determine how well the items in each domain relate to one another. The internal consistency coefficient indicates how effectively the individual domain scores on the Early LAP are measuring defined constructs (e.g., gross motor, fine motor, cognitive skills). The higher the value, the greater the consistency of items within the domain. Cronbach's coefficient alpha was used to calculate the internal consistency of each domain for the total Core Sample (N=242) by age groups. All items before the basal were counted as correct and all items above the ceiling were counted as incorrect.

Table 9 presents the results of the internal consistency analyses. The alpha coefficients for the total Core Sample (.96 to .99) indicate strong internal consistency for each domain. The alpha coefficients for the individual age groups are also quite high (.84 to .98). These results indicate that the Early LAP items show strong internal consistency within each domain.

Table 9. Internal Consistency of Early LAP Developmental Age Domain Scores by Age Group

DOMAINS	2 months to 12 months[a]	13 months to 24 months[b]	25 months to 36 months[c]	Total[d]
Gross Motor	.98	.97	.84	.99
Fine Motor	.96	.94	.90	.98
Cognitive	.97	.96	.96	.99
Language	.91	.96	.95	.98
Self-Help	.97	.96	.93	.98
Social Emotional	.91	.91	.87	.96

Note: For all correlations, $p < .01$ N: a (GM=75, FM=75, C=75, L=75, SH=72, SE=74) b (GM=80, FM=88, C=88, L=88, SH=87, SE=84) c (GM=62, FM=75, C=72, L=73, SH=72, SE=72) d (GM=217, FM=238, C=235, L=236, SH=231, SE=230)

Standard Errors of Measurement

The Standard Error of Measurement (SE_m) provides an estimate of the amount of error between an individual's observed score and the true score. The SE_m has an inverse relationship with reliability so that as reliability increases, the SE_m decreases, indicating greater confidence in the accuracy of the observed scores. SE_m's were calculated for each domain of the Core Sample (N=242) by the following formula, $SE_m = s\sqrt{1 - r}$, where SE_m is the standard error of measurement, s is the standard deviation of the observed scores, and r is the reliability of the assessment instrument. The internal consistency reliability coefficients reported in the previous section were used to calculate the SE_m. Table 10 presents the SE_m's for each domain of the Early LAP by age group. The results of each of these calculations produced fairly small SE_m's, indicating a high degree of confidence that the observed scores on the Early LAP will provide an accurate representation of an individual's skills.

Table 10. Standard Errors of Measurement of Early LAP Developmental Age Domain Scores by Age Group

DOMAINS	2 months to 12 months[a]	13 months to 24 months[b]	25 months to 36 months[c]	Total[d]
Gross Motor	0.57	1.11	2.27	1.08
Fine Motor	0.71	1.24	1.59	1.43
Cognitive	0.58	1.07	1.05	1.04
Language	1.08	1.21	1.27	1.51
Self-Help	0.57	1.07	1.52	1.26
Social Emotional	1.16	2.69	1.57	2.41

Note: For all correlations, p <. 01 N: a (GM=73, FM=73, C=73, L=68, SH=47, SE=69) b (GM=85, FM=86, C=88, L=87, SH=85, SE=75) c (GM=71, FM=74, C=72, L=72, SH=68, SE=57) d (GM=229, FM=233, C=233, L=227, SH=200, SE=201)

Test-Retest Reliability

Test-retest reliability indicates the extent to which scores on an assessment instrument are consistent from one time period to the next. Because the Early LAP measures a continuum of developmental skills, the test-retest reliability was measured over a short period of time so that any differences between administrations were more likely to reflect reliability rather than individual development. Therefore, the Early LAP was administered by the same examiner on two separate occasions one to three weeks apart for a subset of children from the overall Project Sample (Test-Retest Sample). The Test-Retest Sample was composed of 92 children from 2 to 44 months old (Mean = 18.55, SD = 9.74), including both typically and atypically developing children. The sample consisted of 48.9% females and 51.1% males, and was 15.2% African American, 3.3% Asian and Pacific Islander, 15.2% Hispanic origin, 62% White, and 4.3% Other racial/ethnic origins. Test-retest reliability was determined by calculating the correlations between domain scores from the first and the second test administrations using Pearson's *r*. Table 11 presents the means and standard deviations for the first and second test scores and the test-retest correlation coefficients for each domain. The resulting correlations (.96 to .99) indicate a high degree of stability in individual test scores over short intervals of time.

Table 11. Means, Standard Deviations, and Correlations of Early LAP Developmental Age Domain Scores for Test-Retest Reliability Sample

	First Testing		Second Testing		*r*
DOMAINS	Mean	SD	Mean	SD	
Gross Motor	19.16	11.33	19.15	11.65	.98
Fine Motor	19.03	10.13	19.81	10.72	.97
Cognitive	18.59	10.43	19.26	10.52	.99
Language	18.93	10.44	18.57	10.52	.99
Self-Help	20.91	9.29	20.94	9.41	.96
Social Emotional	19.85	11.66	20.20	11.90	.99

Note: For all correlations, p <. 01

N: GM=79, FM=85, C=84, L=81, SH =72, SE =69

Interrater Reliability

Interrater reliability measures the extent to which different examiners achieve the same results when independently assessing the same child. The results of the assessment should reflect the developmental skills of the child independent of the particular person administering the test, assuming proper procedures have been followed. In order to determine the level of interrater reliability, the Early LAP was administered to a subset of children from the overall Project Sample by two different examiners on two separate occasions one to three weeks apart (Interrater Reliability Sample). The Interrater Reliability Sample was comprised of 49 children from 2 to 43 months old (Mean = 20.80, SD = 10.27), including 40.8% females and 59.2% males, and was 22.4% African American; 4.1% American Indian, Eskimo, and Aleut; 4.1% Asian and Pacific Islander, 4.1% Hispanic origin, 63.3% White; and 2.0% Other racial/ethnic origins.

Interrater reliability was determined by computing the correlations between the domain scores from the test administrations by two different examiners using Pearson's *r*. Table 12 presents the means and standard deviations for both test administrations and the interrater reliability correlation coefficients for each domain. The resulting correlations indicate a high degree of reliability (.96 to .99) when the Early LAP is administered by two different examiners.

Table 12. Means, Standard Deviations, and Correlations of Early LAP Developmental Domain Age Scores for Interrater Reliability Sample

	First Testing		Second Testing		*r*
DOMAINS	Mean	SD	Mean	SD	
Gross Motor	22.63	10.41	22.02	10.02	.97
Fine Motor	21.46	10.06	21.74	9.89	.99
Cognitive	21.42	10.37	21.98	10.32	.99
Language	22.63	10.37	22.89	10.28	.96
Self-Help	24.17	10.78	23.27	9.03	.96
Social Emotional	23.45	12.06	24.07	11.60	.98

Note: For all correlations, $p < .01$
N: GM=44, FM=47, C=47, L=46, SH=39, SE=43

Validity

The foremost authoritative reference on validity and other test matters, the *1999 Standards for Educational and Psychological Testing*, defines validity as, "The degree to which accumulated evidence and theory support specific interpretations of test scores entailed by proposed uses of a test." (American Educational Research Association, American Psychological Association, and National Council on Measurement in Education, 1999, p.184). This definition emphasizes that inferences derived from test scores give meaning to them beyond simply reporting numbers. Four types of analyses are recognized by the *1999 Standards for Educational and Psychological Testing* as demonstrating the validity of test score inferences: (1) construct-related evidence; (2) content-related evidence; (3) predictive evidence; and (4) concurrent evidence. Three of these types of validity analyses are presented below: construct validity, and criterion validity which were conducted as part of this study, and content validity which was conducted in a previous study.

Construct Validity

Evidence of construct validity can be inferred by examining the intercorrelations among different areas of an assessment instrument. Thus, to examine the extent to which the different domains measure different skills, the intercorrelations among domains were calculated. High correlations among areas would suggest that they are measuring similar underlying constructs, while low correlations would suggest that they are measuring different underlying constructs. Domains that are more strongly related conceptually and that have more items in common would be expected to have relatively stronger intercorrelations. Zero-order correlations using Pearson's *r* were calculated between developmental age domain scores for the Core Sample (N=242) as shown below the diagonal in Table 13. While these high positive correlations (.87 to .97) potentially indicate a single underlying construct, because these zero order correlations were calculated across age groups, they also indicate differences in skill performance as a result of age.

To separate these two elements, partial correlations controlling for age were calculated between developmental age domain scores as depicted above the diagonal in Table 13. The magnitudes of the partial correlation coefficients are substantially smaller than the zero-order correlations (.27 to .76) in the modest to moderate range. The relatively higher correlations among the fine motor, cognitive, and language domains are likely a result of a number of shared items, while the less conceptually related domains evidence lower correlations. These results suggest that while the different domains of the Early LAP are somewhat related, they are also measuring somewhat independent aspects of development.

Table 13. Zero-order Correlations and Partial Correlations Controlling for Age Among Early LAP Domains

DOMAINS	Gross Motor	Fine Motor	Cognitive	Language	Self-Help	Social Emotional
Gross Motor		.50	.53	.51	.31	.58
Fine Motor	.93		.76	.57	.33	.39
Cognitive	.93	.97		.71	.48	.34
Language	.92	.94	.96		.27	.44
Self-Help	.88	.91	.93	.88		.27
Social Emotional	.93	.97	.90	.91	.87	

Note: For all correlations, $p < .01$

N: GM=229, FM=233, C=233, L=227, SH=200, SE=201

Criterion Validity

Criterion validity (also known as concurrent validity) is the extent to which individual scores on one test correspond to scores on an established test of similar constructs. These two tests must be administered consecutively, so as to minimize differences due to development or other variations in test conditions. The established test is the criterion used to validate the new test (Gall, Borg, & Gall,1996). In this study, the correspondence between the Early LAP and the Mental and Motor Scales of the BSID-II was examined to investigate the criterion validity of the Early LAP. The Core Sample (N=242) was administered both the Early LAP and the BSID-II Mental and Motor Scales during the same testing session or in two sessions in close proximity. Criterion validity was determined by examining the correlations using Pearson's *r* between the Early LAP developmental age domain scores and the BSID-II Mental and Motor Scale developmental age scores for conceptually related areas.

Table 14 presents the correlations between the developmental age scores for the Early LAP domains and the BSID-II Mental and Motor Scales by age group. The results indicate a strong correlation (.90 to .97) between the Early LAP and BSID-II scores in each domain for the overall sample. Fairly high correlations were found within the 2-12 month old age range (.83 to .95) and the 13-24 month old age range (.72 to .88). The correlations for the 25-36 month old age range (.47 to .83) were somewhat lower, particularly in the self-help and social emotional domains. These somewhat lower correlations for the oldest age group may reflect some aging out of the Early LAP assessment for these children, similar to the analyses discussed earlier.

Table 14. Correlations Between the Early LAP Domains and the BSID-II Mental and Motor Scales for Developmental Age Scores by Age Group

	2 months to 12 months[a]		13 months to 24 months[b]		25 months to 36 months[c]		Total[d]	
Early LAP DOMAINS	BSID-II Mental	BSID-II Motor	BSID-II Mental	BSID-II Motor	BSID-II Mental	BSID-II Motor	BSID-II Mental	BSID-II Motor
Gross Motor		.95		.72		.61		.92
Fine Motor		.90		.72		.66		.94
Cognitive	.93		.88		.83		.97	
Language	.87		.88		.75		.96	
Self-Help	.83		.83		.58		.91	
Social Emotional	.85		.72		.47		.90	

Note: For all correlations, $p < .01$ N: a (GM=73, FM=73, C=73, L=68, SH=47, SE=69) b (GM=85, FM=86, C=88, L=87, SH=85, SE=75) c (GM=71, FM=74, C=72, L=72, SH=68, SE=57) d (GM=229, FM=233, C=233, L=227, SH=200, SE=201)

Content Validity

Content validity examines the extent to which the scores on an assessment actually represent the content they purport to measure. Content validity is determined through a systematic examination of an assessment instrument by content experts. Fleming (2000) conducted a study at Johns Hopkins University that included a content validity examination of each item on the Early LAP. Four different experts evaluated the content of the Early LAP both in terms of the developmental ages assigned to items and the representativeness of the items for the intended content areas. Experts examined the Early LAP items in comparison with four other standardized measures and with four widely used textbooks on infant and toddler development. The results of this study indicated that all of the items were representative of the skills tested and that 387 of the 414 items (93%) on the Early LAP were appropriately categorized by developmental age. The distribution of the remaining 27 items in which the experts disagreed with the developmental age categories on the Early LAP included nine items in the gross motor domain, eleven items in the fine motor domain, one item in the cognitive domain, two items in the language domain, four items in the self-help domain, and none in the social emotional domain. The discrepancies between the Early LAP classification and the experts' opinions for gross motor items differed by only one month and by no more than four months for fine motor. Discrepancies for the other domains differed by six to eight months. Although there were no differences in the social emotional domain, Fleming noted that some developmental age ranges had very few items. In sum, the Early LAP was found to have good content validity.

Children With Disabilities

The Atypical Development Sample was composed of a subset of 17 children who had been professionally diagnosed as having disabilities prior to this study. These children ranged from 6 to 43 months old (Mean = 25.47, SD = 12.04), were 29.4% females and 70.6% males, and were 11.8% African American, 23.5% Hispanic origin, 58.8% White, and 5.9% Other racial/ethnic origins. The distribution of children across geographic areas was 17.6% from the Northeast, 35.3% from the South, 11.8% from the North Central, and 35.3% from the West. Of the 17 children in the sample, 10 children had developmental delays, five children had motor disabilities, and two children had speech and language disabilities. Table 15 depicts the means, standard deviations, and correlations with chronological age (using Pearson's *r*) for each domain for the Atypical Development Sample. As expected, the mean developmental age scores for each domain are substantially lower than the children's chronological ages, and the correlations between developmental age scores and chronological age are substantially lower than the correlations for children with typical development (See Table 8). These results suggest that the Early LAP discriminates children's skill levels independently of their age, and that it can be used effectively to assess the developmental skills of children with disabilities.

Table 15. Means, Standard Deviations, and Domain Correlations of Early LAP Developmental Age Domain Scores for Atypical Development Sample

DOMAINS	Means	SD	*r*
Gross Motor	17.29	13.31	.70
Fine Motor	16.29	10.59	.74
Cognitive	17.13	9.80	.72
Language	14.94	10.80	.69
Self-Help	19.42	8.67	.73
Social Emotional	18.00	13.03	.72

Note: For all correlations, $p < .01$
N: GM=17, FM=17, C=15, L=17, SH=14, SE=13

Concluding Remarks

Overall, this research found the Early LAP to be reliable and valid in assessing the development of young children. The Early LAP was found to have relatively high correlations between developmental age domain scores and chronological age, especially for children in the birth to two-year-old range, while older children aged out on some items and/or domains. The Early LAP also evidenced good internal consistency and fairly low standard errors of measurement for each domain. Very good test-retest and interrater reliability were found for all domains of the Early LAP. Evidence of adequate construct validity was also shown. The Early LAP was found to have very good criterion validity, based on comparisons with the Bayley Scales of Infant Development–Second Edition. A separate study indicated that the Early LAP also demonstrated good content validity (Fleming, 2000). In sum, the Early LAP evidences good reliability and validity characteristics, and is an appropriate tool for use in assessing young children's developmental functioning.

References

American Educational Research Association, American Psychological Association, and National Council on Measurement in Education. (1999). 1999 Standards for Educational and Psychological Testing. Washington, DC: American Educational Research Association.

Bayley, N. (1993). Bayley Scales of Infant Development. San Antonio, TX: The Psychological Corporation.

Fleming, J. A. (2000). An Examination of Interrater Reliability of the Early Learning Accomplishment Profile. Education. Baltimore, Maryland: Johns Hopkins University.

Gall, Meredith D., Borg, Walter R., Gall, Joyce P. (1996). Educational Research. White Plains, NY: Longman Publishers USA.

Glascoe, F. P. (1998). Technical Report for the Brigance Screens. North Billerica, MA: Curriculum Associates, Inc.

Glover, M. E., J. L. Preminger, et al. (1995). The Early Learning Accomplishment Profile for Developmentally Young Children. Chapel Hill, NC: Chapel Hill Training Outreach Project, Inc.

Kaplan Early Learning Company. (n.d.). A Workshop for the E-LAP. Lewisville, NC: Kaplan Early Learning Company.

Nehring, A. D. and E. F. Nehring (1992). LAP-D: Learning Accomplishment Profile-Diagnostic Standardized Assessment. Lewisville, NC: Kaplan Early Learning Company.

U.S. Census Bureau. (1995). Population Profile of the United States: 1995. Washington, DC: U.S. Government Printing Office.

Appendix

Structure for the Early Learning Activity Cards

Early Learning Activity cards are available through Kaplan Early Learning Company. The cards are divided into six domains of the Early LAP-gross motor, fine motor, cognitive, language, self-help, and social emotional. Each card contains one or more activities focused on a particular skill from the Early LAP. An example of the Early Learning Activity card is depicted below.

Early Learning Activities

Cognitive #44
10 months

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Uncovers Toy Seen Hidden

Skill: The child will remove a handkerchief for the purpose of securing the toy.

Materials: Small toy; handkerchief or piece of cloth

Activity:

1. Many children at this age have developed the sense that things continue to exist even though they are not in sight. They enjoy hiding games such as "Peek-a-boo", "Hide a toy", and fingerplays such as "Two Little Blackbirds". Play with the child, noting the growing ability to find things that (s)he wants even if the toy is partially hidden.

2. You may play a game to help develop this skill in the following way:
   a. Sit on an uncluttered floor, facing the child. Get the child's attention by saying his/her name.
   b. Place a small familiar toy in front of the child, just out of reach. Say, "Here's your (bunny)!"
   c. Quickly cover the toy with a handkerchief and ask, "Where did (bunny) go?"
   d. Pause. Wait for child to respond. Say, _____ (child's name), find the (bunny).
   e. If child succeeds, praise him/her by saying, "You found the (bunny)! Good job!"
   f. If the child is not interested, try at a later time. If (s)he responds with enthusiasm, repeat using a variety of toys.

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Original Sources for Early LAP

The full citations for the original sources of the Early LAP are listed below. While many of these instruments have been revised, the original date of publication is provided on this list.

Bayley, Nancy. (1969). Bayley Scales of Infant Development. New York, NY: The Psychological Corporation.

Braga, Laurie and Joseph. (1975). Learning and Growing: a Guide to Child Development. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Bzoch, Kenneth R., and League, Richard. (1970). Receptive - Expressive Emergent Language Scale. Baltimore, MD: University Park Press.

Caplan, Frank, ed. (1973). The First Twelve Months of Life: Your Baby's Growth Month-by-Month. New York, NY: Grosset and Dunlap.

Cratty, B.J. (1973). Teaching Motor Skills. Englewood Cliffs, NJ: Prentice-Hall.

Cattell, Psyche. (1940). The Measurement of Intelligence of Infants and Young Children. New York, NY: The Psychological Corp.

Doll, Edgar A. (1966). Preschool Attainment Record. Circle Pines, MN: American Guidance Service.

Frankenburg, W.K., and Dodds, J.B. (1969). Denver Developmental Screening Test. Denver, CO: University of Colorado Medical Center.

Gesell, Arnold L. (1940). The First Five Years of Life: a Guide to the Study of the Preschool Child from the Yale Clinic of Child Development. New York, NY: Harper Brothers.

Gesell, Arnold L., and Amatruda, Catherine S. (1947), Developmental Diagnosis: Normal and Abnormal Child Development, Clinical Methods and Pediatric Applications. Second Edition. New York, NY: P.B. Hoeber.

School of Public Health of Hawaii. (1976). Enrichment Project for Handicapped Infants: Hawaii Early Learning Guide. Honolulu, HI: School of Public Health of Hawaii.

Hurlock, Elizabeth B. (1972). Child Development. Fifth Edition. New York, NY: McGraw-Hill.

Illingworth, R.S. (1975). The Development of the Infant and Young Child, Normal and Abnormal. Sixth Edition. New York, NY: Churchill Livingston.

Ireton, Harold R., and Twing, Edward J. (1972). Minnesota Child Development Inventory. Minneapolis, MN: Interpretative Scoring.

Knobloch, Hilda, and Pasamanick, Benjamin, eds. (1974). Gessell and Armatruda's Developmental Diagnosis: The Evaluation and Management of Normal and Abnormal Neuropsychological Development in Infancy and Early Childhood. Third Edition. Hagerstown, MD: Harper & Row.

Sheridan, Mary D. (1968). The Developmental Progress of Infants and Young Children. London, England: H.M.S.O.

Slosson, Richard L. (1963). Slosson Intelligence Test. East Aurora, NY: Slosson Educational Publications.

Stutsman, Rachel. (1931). Merrill-Palmer Scale. Woodale, IL: Stoelting Co.

Terman, Lewis M. and Merrill, Maud A. (1968). Stanford-Binet. Chicago, IL: Riverside Publishing.

Terman, Lewis M., and Merrill, Maud. (1937). Measuring Intelligence: A Guide to the Administration of the New Revised Stanford-Binet Tests of Intelligence. Boston, MA: Houghton-Mifflin.

Virginia State Department of Education. (1975). A Comprehensive State Plan for the Education of Young Handicapped Children Below Age 5. Richmond, VA: Virginia State Department of Education, Division of Special Education..

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