LAP-D

Learning Accomplishment Profile Diagnostic 3d Edition

The Learning Accomplishment Profile Diagnostic Edition

Examiner's Manual & Technical Report

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The Learning Accomplishment Profile-Diagnostic (*LAP-D*)
Third Edition

Examiner's Manual
& Technical Report

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Initial Development

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Acknowledgments

Initial Development of the *LAP-D*

LAP-D Second Edition

LAP-D Third Edition

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Chapter 1
Introduction:
The Learning Accomplishment Profile-Diagnostic (*LAP-D*)
Third Edition

Overview

As a norm-referenced assessment tool, the *Learning Accomplishment Profile-Diagnostic (LAP-D) Third Edition* provides a systematic method for observing individual development of children functioning in the 30 to 72 month age range. Teachers, special educators, clinicians, parents, and other professionals can use the *LAP-D* to provide a context for understanding individual skill development in comparison to the standardization sample. In addition, the results of the *LAP-D* can be used to plan and implement individualized, developmentally appropriate activities for children in educational and/or home settings. The *LAP-D* is designed for children both with typical and with atypical development.

The *LAP-D Third Edition* is based on research conducted over a two-year period (2002 to 2004) in order to provide updated norms as well as to develop a Spanish version of the instrument. During the past decade, many factors have changed in the overall population of the United States and the provision of early childhood services. Without a doubt, these changes had an impact upon the psychometric properties of the *LAP-D,* which was previously standardized in 1992. Furthermore, the significant increase in the Latino population in the United States during the past decade (U.S. Census, 2000) has led to the need for a Spanish edition of the *LAP-D*. The research included representative samples of both English- and Spanish-speaking children in order to re-norm the *LAP-D* in English as well as to develop and establish norms for the *LAP-D* in Spanish. Furthermore, psychometric properties, such as test construction, reliability, and validity, were examined for both the English and Spanish versions to ensure the technical competence of the *LAP-D* for each language group.

The original *LAP-D* was founded on theoretical and research-based information in which skill development is viewed as a continuum, moving from simple to more complex behaviors, with the premise that such development takes place in small increments (LeMay et al, 1977). This third edition of the *LAP-D* continues to be based on sequential developmental milestones identified as essential indicators of child development in current theoretical and research-based information. There were no changes to the overall structure of the *LAP-D* (four developmental domains with eight subscales), nor to the specific behaviors assessed. Some changes were made to the sequence of items within a developmental age range or to the developmental age range for a given item according to the study results. However, the purpose and philosophical approach of the original *LAP-D* remain the same.

The following research questions guided this study:

- What are the psychometric properties of the instrument, including the reliability and

validity, in English and Spanish?
- Are items placed in the correct sequence within each developmental age range?
- Does the instrument provide meaningful results for children of diverse cultural, socioeconomic, and family backgrounds?
- Does the instrument function appropriately for children with atypical development?
- Do the materials reflect developmentally appropriate practices?

Features of the *LAP-D*

The *LAP-D* is a comprehensive, norm-referenced measure designed for use by practitioners and clinicians to assess the development of young children. Standardized materials, procedures, and criteria for determining a child's level of functioning are included for each item to help ensure consistent and accurate results. The *LAP-D* includes the following features.

Content. The *LAP-D* consists of a total of 226 developmental skills arranged hierarchically in four domains of development, with two subscales in each domain:

Domains:	**Fine Motor**	**Cognitive**	**Language**	**Gross Motor**
Subscales:	Writing	Counting	Naming	Body Movement
	Manipulation	Matching	Comprehension	Object Movement

Dual Language. The *LAP-D* may be administered in either English or Spanish. Both the English and Spanish versions were standardized on separate national samples of children based on the primary language of the participants. The consensus method was used to translate/adapt[1] the *LAP-D* into Spanish to ensure the quality of the final product. This twelve-step process included a detailed review process by a consortium of professionals from early childhood education and related fields representing seven different Spanish-speaking populations as well as a pilot study. (See page 42 for details about the translation/adaptation process and pilot study.)

Age Range. The *LAP-D* is appropriate for children functioning in the 30 to 72 month age range. Children with disabilities who are older than 72 months may be assessed using the *LAP-D* if observational data or other diagnostic evaluation data indicate they are functioning in the 30 to 72 month age range. However, for children older than 72 months, the standard scores should not be used.

Administration. Generally, it takes 1-1½ hours to administer the *LAP-D*. However, if a child is functioning significantly above or below age level, it may take longer to complete the full assessment. The *LAP-D* may be administered individually or in a station-to-station approach.

Periodic and Ongoing Assessment. In order to use the *LAP-D* to document children's development, it should be administered at specified checkpoints (e.g., beginning-, middle-, end-

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[1] Geisinger (1994) suggests test adaptation as the more accurate terminology for cross-cultural translations of assessment tools, which "documents the adaptations in references to culture, in content, and in wording that are needed in addition to simple translation in revising a test" (p. 305).

of-year). For example, at the beginning of the year, the *LAP-D* may be administered to obtain a baseline of a child's development. As the year progresses, the *LAP-D* can be re-administered to examine progress.

Results. Two types of results are generated by the *LAP-D*—standard scores and developmental data on specific skills. ***Standard scores*** indicate a child's level of skills in comparison to the standardization sample (other children of similar ages and characteristics). Types of standard scores generated by the *LAP-D* are: percentile ranks, Z-Scores, T-Scores, Normal Curve Equivalents (NCE Scores), and Age Equivalent Scores. These scores can be used to understand a child's overall development within a domain (e.g., gross motor), as well as to examine the pattern of development across domains. Such scores are often used for meeting local, state, and federal reporting requirements. ***Specific skill development data*** shows a list of mastered and emerging developmental skills, as well as skills beyond a child's current developmental level. This information can be used to develop short-term, individualized instructional plans and objectives. Such information is also useful for developing an Individual Education Program (IEP) or an Individualized Family Service Plan (IFSP) for children with disabilities.

Technical Qualities. A sample of 2099 children participated in the *LAP-D* standardization study, 1124 English-speaking children and 975 Spanish-speaking children. A stratified sampling procedure was used based on language, geographic region, age, race, gender, and type of setting. The results suggest that the *LAP-D* is a reliable and valid measure for assessing the skill development of both English- and Spanish-speaking children. Study results indicate strong correlations (.74 to .90) between chronological age and raw scores for the domains and subscales. Good reliability based on test-retest correlations is indicated for both the English-speaking sample domain (.95 to .97) and subscale (.88 to .96) levels and on the Spanish-speaking sample domain (.93 to .95) and subscale (.86 to .94) levels. In addition, good interrater reliability is indicated for both the English-speaking sample domain (.90 to .93) and subscale (.82 to .93) levels and the Spanish-speaking sample domain (.86 to .94) and subscale (.72 to .92) levels. Construct and criterion validity results also indicate that the *LAP-D* is valid when compared with other established instruments. See Chapters 5 and 6 for detailed information about the *LAP-D* technical qualities.

Assessment Materials. The *LAP-D* Assessment Kit contains all of the materials necessary for administering and scoring the *LAP-D* in both English and Spanish, except for a few environmental items (e.g., stairs, chairs). In addition, computer scoring assistant software is available in web, computer, and PDA formats. *LAP-D* Planning Cards and a video are also available. See page 11 for detailed information about *LAP-D* materials.

Differences between the *LAP-D Second Edition* (1992) and the *LAP-D Third Edition* (2005)

The purpose of this study was to re-examine the psychometric properties of the *LAP-D*, to re-norm the English version, and to translate and establish norms for the Spanish version. Therefore, to the extent possible, minimal changes to the instrument were made. For example,

the *LAP-D Third Edition* is comprised of four domains, each of which is divided into two subscales, exactly as the previous edition. Similarly, the same developmental milestones are included on both the second and third editions. However, changes in the placement within and between developmental age categories were made for 22 items based on study results to ensure the appropriate sequence of items and developmental age levels.

Another difference is the addition of the Spanish version of the *LAP-D*, and presentation of the instrument in a dual language format. The Spanish translation/adaptation of the *LAP-D* was matched to the English version as closely as possible. Developmental milestones are the same on both instruments; however, in some cases the content of the Spanish version differs from the English version to ensure its cultural and linguistic integrity. For example, different words were used in the Spanish version when the translation was not developmentally or culturally appropriate. Similarly, the same illustrations and manipulative materials are used with each language except for items CM21, CM24, LN30, and LC23.

A third difference between these two editions of the *LAP-D* is the organization of the assessment kit. The *LAP-D* is provided in a dual language kit that includes all the necessary materials for administering the *LAP-D* in either English or Spanish, except for environmental items like stairs or chairs. Unlike the second edition, the third edition of the *LAP-D* has one *Examiner's Manual* and one container with all kit contents rather than separate manuals and kit materials for each subscale. The *Examiner's Manual* for the third edition has English text on one side and Spanish text on the other side. *LAP-D* illustrations are contained in a separate book rather than in the *Examiner's Manual* as they were in the previous edition.

Lastly, new norms tables were developed for scoring and interpreting *LAP-D* results for the English and Spanish versions, with separate tables for each language group. (See page 77 for the norms tables.)

Applications of *LAP-D*

As a norm-referenced assessment, the *LAP-D* has a number of useful applications for the instruction of young children. *LAP-D* results can be applied in the following ways:

- To provide individual skill development information for planning developmentally appropriate activities at home and school based on a child's performance relative to a standardized score. Identification of developmental levels assists teachers in determining the appropriate "starting point" in curriculum planning.

- To evaluate a child's entry and exit skills and/or to validate the intervention program. As a pre-assessment measure, the *LAP-D* is a consistent record of the skills the child has mastered prior to admission into the program. As a post-assessment measure, the *LAP-D* is useful for the determination of a child's progress and may be useful to parents, teachers, and program evaluators in determining if the instructional program is having a beneficial effect on the child's development.

- To assist in the identification of children with disabilities and the subsequent development of an IEP when used as a part of a multi-disciplinary evaluation. The appropriate evaluation of young children should utilize both informal (e.g., observation, work samples) and formal techniques such as the *LAP-D* (NAEYC & NAECS/SDE, 2003).

- To conduct research on the development of preschool, kindergarten, or special needs children.

- To train teachers, paraprofessionals, clinicians, and parents on developmentally appropriate assessment practices.

- To assist early childhood programs in meeting national and state requirements (e.g., Head Start Child Outcomes, state standards)

Limitations of the *LAP-D*

Though the *LAP-D* has many possible applications, the examiner should apply some basic principles in its use. The *LAP-D* should never be used as a single measure for making educational decisions; rather, it should always be used in conjunction with a variety of formal and informal assessment procedures administered by different individuals.

Children functioning at the lower end of the age range (below 36 months) may be more fully evaluated using the *Early LAP*, which is designed to assess children birth to three years of age. For these children, the *Early LAP* assesses a wider range of behaviors below the 36-month age level.

User Qualifications

The *LAP-D* is a norm-referenced instrument with clear guidelines for administration. Care should be taken to follow these specified guidelines in order to achieve the most accurate results. Administration of the *LAP-D* does not require specific licensure or certification; however, training and/or experience in assessment procedures is essential for effective administration. Trained teachers, paraprofessionals, clinicians, special educators, psychologists, occupational and physical therapists, speech-language pathologists, and others familiar with child development can administer the *LAP-D*. To ensure appropriate and accurate use of assessment information from the *LAP-D*, the examiner must become thoroughly familiar with the *Examiner's Manual & Technical Report* through self-study or professional training. The *Standards for Educational and Psychological Testing* (1999) recommends that test users "study and evaluate the materials provided by the test developer (p. 113)." The *Standards* especially emphasize knowing the purposes, administration procedures, and appropriateness of the assessment for specific populations, as well as the reliability and validity of the assessment. In addition, examiners should practice administration of the assessment to help develop or improve the skills necessary for effective administration.

Chapter 2
Overview of the *LAP-D*

This chapter provides an overview of the *LAP-D* instrument, including the conceptual framework and history. Information about the content revisions and assessment materials of the third edition of the *LAP-D* are presented also.

Underlying Principles of *The LAP System*

The LAP System consists of a related set of instructional and assessment materials that offer a comprehensive approach to understanding and facilitating the development of young children. *The LAP System* includes screening and assessment tools to generate a profile of individual development and provide a means of monitoring ongoing development; curriculum materials that promote effective and developmentally appropriate programming; and instructional materials that enhance parent involvement and provide guidance for important milestones in young children's lives. This assessment and curriculum model is grounded in early childhood research that recognizes young children as active partners in the learning process by:

- Emphasizing the value of child choice and responsive teaching
- Promoting individualization and respect for each child's unique qualities
- Including activities to help children understand and respect diversity (culture, gender, abilities)
- Emphasizing the importance of family and community
- Promoting inclusion of children with disabilities.

The *LAP-D* is one component of *The LAP System*, designed to provide a developmentally appropriate assessment tool that can be used independently or in conjunction with other elements of *The LAP System* to create a comprehensive educational plan.

History of the *LAP-D*

In 1969, the Chapel Hill Training Outreach Project (CHTOP) 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 for young children with disabilities and their families. Anne R. Sanford developed the first *Learning Accomplishment Profile* (*LAP*) during this time. Items on the *LAP* were drawn from normative-based measures for children birth to six years old. The original *LAP* was designed to observe the development of individual children by providing tasks or situations typical of young children's development that would interest the child and stimulate an observable response as stated by Sanford (1981), "[the *LAP* addresses] the need for a structured process of assessment which specifies prerequisite skills and facilitates a task analysis approach to successful learning." This basic philosophical thrust was applied to the development of the *LAP-D*.

In 1974, the *First Form* of the *LAP-D* was developed under a supplementary grant from the Office of Child Development. Relevant research was conducted in the winter of 1974 and spring of 1975. The *First Form* was an experimental edition and many of its items were drawn from the *LAP*. It consisted of a mimeographed *Examiner's Manual* and a preliminary assessment kit. The fundamental rationale for the development of the *First Form* was the creation of an effective tool for evaluating the progress of individual children's development and for monitoring and evaluating instructional programs. Another fundamental goal was, and still is, the construction of a measuring device sufficiently easy to administer, so that teachers and paraprofessionals could use it reliably and have confidence in the accuracy of the results.

In 1975, the *Second Form* of the *LAP-D* was developed, using the *First Form* as the model under a grant from the Office of Child Development. The *Second Form* of the *LAP-D* consisted of a commercially produced and marketed assessment kit published by Kaplan School Supply Corporation. The *Second Form* of the *LAP-D* was designed with the goal of implementing a widespread field-test. The field-test data and content validity data derived from reviews by early childhood professionals were used to improve the *LAP-D*. All analyses were conducted on a sample of 239 children balanced by gender and race, but restricted to a one-year age range of children between five and six years old (LeMay et al, 1977). Changes to the *Second Form* involved the elimination of certain items that were difficult to assess accurately and the addition of the developmental ages usually associated with each behavior. Data analyses contributed information necessary for evaluating the accuracy of the task sequences, the reliability of individual items, and the number of items required for an adequate correlation of test scores with chronological age.

In 1977, the first edition of the *LAP-D* was developed with research and development funding provided by the Office of Child Development and the Bureau of Education for the Handicapped, under the Department of Health, Education, and Welfare (LeMay et al, 1977). The first edition was composed of five discrete scales and thirteen subscales. Based on the cumulative research findings in the area of early childhood development at the time (Gesell, 1940; Griffin, 1975; Hammill, 1971; Ilg & Ames, 1955; Lillie, 1975; Sanford, 1970;), the following developmental areas were identified: physical development, psychomotor development, cognitive development, linguistic development, self-management, and social development. With the exception of social development, an area not effectively assessed in a one-to-one standardized format, each of these general areas was incorporated into the first edition of the *LAP-D*. Also, items that signal milestones in normal child development were included, relying heavily on the body of available research findings (Bayley, 1969; Cattell, 1950, Frankenburg and Dodds,1969; Doll, 1965; Gesell, 1940; Terman, 1937) and numerous others who identified behaviors which appear to be characteristic of children at given chronological ages.

According to LeMay (1977), the sample size for this study was only 35 children because of time limitations. Although this small sample size may have had limited the generalizability of the results, the analyses accordingly restricted the number of predictors in the ANOVA and

regression procedures. This study extended the age range of the sample beyond the previous study to children between 30 and 73 months of age (mean = 46.63 months, SD = 11.7 months).

From 1977-1992, early childhood educators across the United States used the first edition of the *LAP-D*, which was a criterion-referenced instrument. A number of local pilot studies, such as one conducted with over 800 kindergarten children in Kentucky in 1978-79, reported favorably on the assessment's reliability and validity.

In 1992, with the expansive growth of preschool programs in the first 15 years since the instrument was developed, the demand for norm-referenced assessments appropriate for young children increased. In response to numerous requests, the publisher in collaboration with CHTOP initiated a study to revise, standardize, and norm the second edition of the *LAP-D*. A select team of professionals, including psychologists, teachers, administrators, and other early childhood educators, assisted in the review of the final revisions to the *LAP-D*.

Changes to the second edition of the *LAP-D* included new, updated color illustrations; a new manual format with more explicit written procedures, instructions, and scoring criteria; new, updated, standardized materials in the assessment kit; deletion of items with little or no discrimination and minimal educational value; a revised *Scoring Booklet*; an updated and expanded *Examiner's Manual*; and the addition of a *Technical Report* describing the standardization study. The Self-Help subscales found in the first edition of the *LAP-D* were deleted since they were originally designed for children ages birth to 36 months and because the second edition of the *LAP-D* was standardized on children ages 30 to 72 months, there were no empirical data supporting the validity of these scales.

In 2002, CHTOP received funding to re-norm the *LAP-D* in English and to translate/adapt and establish norms for a Spanish version of the *LAP-D*. CHTOP coordinated the translation/ adaptation of the *LAP-D* into Spanish in collaboration with the Miami-Dade School Readiness Coalition. Once the translation/adaptation was completed, a pilot study was conducted that included 92 children representing different ages, race and ethnicity, gender, socioeconomic status, and types of program settings. Each child was administered the *LAP-D* and the Peabody Picture Vocabulary Test-III (PPVT-III) or Test de Vocabulario en Imágenes Peabody (TVIP) in their primary language (English or Spanish). These data were analyzed and changes were made to the Spanish version to create the field test edition used in the norming study. In addition, changes were made to the English version of the *LAP-D* to ensure the consistency of the instrument across languages. Once these changes were completed, the field test edition of the *LAP-D* in both languages was used for the norming study.

To re-norm the *LAP-D* in English and standardize the Spanish *LAP-D*, a sample of 2099 children participated in the study from five areas throughout the United States representing different ages, race and ethnicity, gender, socioeconomic status, rural/urban settings, and types of program settings participated in the study. Recruitment and data collection took place from October, 2002 through January, 2004. The study included 1124 English-speaking children and 975 Spanish-speaking children. The results suggest that the *LAP-D* is a reliable and valid measure for assessing the skill development of both English- and Spanish-speaking children. Study results

indicate strong correlations (.74 to .90) between chronological age and raw scores for the domains and subscales as well as good reliability based on test-retest correlations (.87 to .99) and interrater reliability correlations (.74 to .90) across both language groups. Construct and criterion validity results also indicate that the *LAP-D* is a very valid instrument when compared with other established instruments. See Chapters 5 and 6 for detailed information about the *LAP-D* norming study.

LAP-D Content

Because the *LAP-D* is a norm-referenced assessment, its overall purpose is to provide a standard against which a child's development in specific content areas can be measured. The *LAP-D* covers four major domains of development, with two subscales for each domain: Fine Motor: (Writing & Manipulation); Cognitive (Counting & Matching); Language (Naming & Comprehension); and Gross Motor (Body Movement & Object Movement). Items are arranged in sequential order of difficulty within each subscale, based on normative patterns of development. Items are grouped into developmental age categories representing the typical age at which most children can perform these tasks. This third edition of the *LAP-D* has retained the same structure as the previous version, as well as most of the same items. The goal of this revision was to make as few changes as possible to the instrument, but to enhance its psychometric integrity where needed. The legitimate problem of assigning a behavior to one specific area of development continues to be challenging for test developers. While it is inappropriate to ignore overlap between areas of development (e.g., cognition/language or fine motor/gross motor), the authors believe that for purposes of programming, the instrument should focus on the *primary* developmental area reflected by a specific behavior.

Some changes were made in the location of the developmental milestones to strengthen the association between chronological age and the placement of items within the developmental age categories. These changes were based on item analyses of each language group separately as well as the total project sample, and were only instituted when the change improved the properties of both language versions.

As a result of these analyses, items were re-arranged within age levels from least to most difficult or moved to a different age level to better accommodate the basal and ceiling format of the assessment. As indicated in Table 1, items were moved within an age range sequence or moved to another age range. However, it should be noted that these changes also affected the numbering of surrounding items.

Table 1. Subscales of the *LAP-D*

Domain/Subscale	Behavior	Second Edition		Third Edition	
		Item	Dev Age	Item	Dev Age
Fine Motor: Manipulation	Laces through holes in outline of picture on lacing card	FM19	48	FM21	54
Fine Motor: Writing	Imitates V stroke	FW10	36	FW11	42
Fine Motor: Writing	Copies V	FW16	54	FW20	54
Fine Motor: Writing	Copies numerals 6-10 with no errors	FW31	72	FW29	72
Cognitive: Matching	Forms square from 2 triangles to match design	CM12	48	CM13	48
Cognitive: Matching	Places pictures of objects on related samples	CM15	54	CM17	54
Cognitive: Matching	Builds 2 steps from 10 small blocks with model removed	CM18	54	CM18	60
Cognitive: Counting	Recites numbers 1-20	CC19	60	CC21	60
Language: Naming	Names 18 pictures of common objects	LN11	48	LN12	48
Language: Naming	Names the cause for 3 given events RW	LN15	54	LN17	54
Language: Comprehension	Points to 6 body parts upon request	LC4	24	LC4	30
Language: Comprehension	Follows 8 simple commands	LC5	24	LC5	30
Language: Comprehension	Responds appropriately to 2 prepositions	LC6	30	LC6	36
Language: Comprehension	Follows two 2-step commands in exact order	LC7	30	LC7	36
Language: Comprehension	Points to 5 pictured objects by use	LC8	30	LC8	36
Language: Comprehension	Selects 4 pictures related to a sentence read	LC15	48	LC13	48
Language: Comprehension	Points to 5 printed numerals between 1 and 10	LC16	54	LC19	60
Gross Motor: Body Movement	Balances on 1 foot for 5 seconds	GB10	36	GB11	36
Gross Motor: Body Movement	Balances on 1 foot for 8 seconds	GB14	42	GB17	42
Gross Motor: Body Movement	Walks up stairs using alternating feet without holding on	GB15	42	GB14	42
Gross Motor: Body Movement	Stretches on tiptoes to obtain bat without losing balance	GB16	42	GB15	42
Gross Motor: Body Movement	Walks forward heel to toe	GB17	42	GB18	42
Gross Motor: Body Movement	Runs	GB18	42	GB16	42

LAP-D Assessment Materials

The *LAP-D* includes four types of materials essential to administering the assessment in both English and Spanish: the *LAP-D Assessment Manual*, the *LAP-D Scoring Booklet*, the *LAP-D Examiner's Manual & Technical Report,* and the *LAP-D Assessment Kit*. Supplementary materials include the *LAP-D Computer Scoring Assistant* (PC, Web-based, and Palm Pilot software) and the *LAP-D Planning Cards*. Each of these materials is described below.

***LAP-D* Assessment Manual.** The *LAP-D Assessment Manual* forms the core of the assessment. It contains a total of 226 developmental skills arranged in chronological sequence in eight subscales representing four domains of development:

Fine Motor: Manipulation   28 items
Fine Motor: Writing   31 items
Cognitive: Counting   33 items
Cognitive: Matching   24 items
Language: Comprehension   23 items
Language: Naming   30 items

Gross Motor: Body Movement   34 items
Gross Motor: Object Movement   23 items

At the beginning of each domain, a sequential list of assessment items by developmental age range is followed by a list of the materials needed to administer the domain. The actual assessment items begin on the page immediately following the materials list. The manual uses the format illustrated in Figure 1 for every assessment item.

Figure 1. Organization of *LAP-D Assessment Manual* Page

COGNITIVE: MATCHING

Item	Behavior	Developmental Age
CM1	**Places circle and square in formboard after demonstration**	**18 months**

MATERIALS: Formboards (circle and square)

PROCEDURE: Maximum trials: 1 task / 3 demonstrations / 3 trials   Time limit per trial: 1 minute

Say: **"Watch how I take these out of the holes and then put them back in the holes."**
1. Place circle and square formboards in front of the child.
2. Remove pieces from the formboards and place to the child's left.
3. Replace the pieces in the formboards, remove them again, and place them to the child's left.

Say: **"Now, you put them back in the holes; you do it."** (Point to each piece and its appropriate hole. Start the timer.)

Note: If child's performance is not acceptable for credit (see scoring criteria), REPEAT the above demonstration and instruction for a second and third trial, if needed.

SCORING: Score (+) for CM1 if child places both circle and square in correct formboard within 3 trials (1 minute maximum per trial).

Each page of the *LAP-D Assessment Manual* contains the following information:

Developmental Domain/ Subscale	The developmental domain and subscale are indicated in the upper left hand corner of the assessment manual (e.g., Cognitive: Matching).
Item/Behavior/ Developmental Age	The number of the item is listed in the shaded box under the developmental domain and subscale title in the upper left hand corner followed by a description of the behavior and the developmental age range.
Materials	All materials needed to administer the item are listed next. Except for a few large items, all assessment materials are contained within a bag that is labeled and color-coded by subscale.
Procedures	The specific procedures for administering each item are located below the list of materials. Where applicable, the maximum number of tasks, trials, and time limits are all listed on the first line of the procedures. Spoken words or phases are in **bold** and should be stated exactly as written in the manual. All procedures must be followed exactly as written to ensure the integrity of the assessment.
Scoring	The criteria for scoring the item are listed under the procedures.

LAP-D Scoring Booklet. The *Scoring Booklet*, designed for use in conjunction with the *LAP-D* Assessment Manual, enables users to record scores for individual children. The *Scoring Booklet* contains an abbreviated form of each item name in the same sequential order as the assessment manuals with space for indicating assessment results, a comment column, and a scoring summary and profile. ***The LAP-D Scoring Booklet is NOT an assessment instrument. It <u>must</u> be used in conjunction with the LAP-D Assessment Manual, which contains the procedures, materials needed, and scoring criteria for each item.***

LAP-D Examiner's Manual* & Technical Report**. General administration procedures and guidelines, as well as detailed information concerning the technical qualities of both the English and Spanish versions of the *LAP-D*, are described in this publication. ***The LAP-D Examiner's Manual & Technical Report includes all normative tables for both the English and Spanish versions.

***LAP-D* Assessment Kit.** The *LAP-D* Assessment Kit includes a standardized set of the materials necessary to administer each item (except item such as stairs and chairs). Because the *LAP-D* is a norm-referenced assessment, the standard materials in the *LAP-D* assessment kit must be used to obtain reliable results.

***LAP-D* Software.** *LAP-D* software to assist early childhood professionals in analyzing data for both individuals and groups of children is available in both web and CD-Rom formats. The *LAP-D* software generates:
- Individual assessment results and summaries
- Classroom profiles
- Parent reports
- Group progress charts
- Links to developmentally appropriate activities
- Individual, classroom, and center analyses of assessment results in relation to the Head Start Child Outcomes.

LAP-D software is also available for Personal Data Assistants (PDA) to assist in the collection and recording of assessment data on children. The PDA software can be used in place of the *Scoring Booklet* to record scores on each assessment item for individual children. The data collected on a PDA can be hot synced to a local computer or a computer linked to the web to transfer the latest assessment information to a secure database for review and report generation.

***LAP-D* Planning Cards.** The *LAP-D* Planning Cards are a set of 226 cards organized with each item on the eight subscales of the *LAP-D*. Each card contains activities for parents or professionals working with children to enhance the acquisition of a specific developmental skill from the *LAP-D*. The cards are available in both English and Spanish.

Chapter 3
Test Administration Guidelines

The first section of this chapter provides information about general factors to consider when administering the *LAP-D*. Additional sections provide detailed guidance for computing the child's chronological age in months, rules for determining starting points, basal and ceiling rules, and other guidelines for other scoring.

Order of Assessment

Generally, the *LAP-D* is administered in the order in which the subscales appear in the *Scoring Booklet* (Fine Motor Manipulation, Fine Motor Writing, Cognitive Matching, etc.). However, because each subscale is administered and scored independently, they may be administered in any order without any significant effect on assessment results. However, to obtain a complete picture of a child's developmental skills, it would be important to administer the different subscales close in time (e.g., the same day or within the same week).

Methods of Assessment

The *LAP-D* may be administered either in a one-to-one or station-to-station format. The traditional method for administration is the *one-to-one* format in which the assessment is administered individually to a single child in one or more consecutive sessions. However, because each subscale may be administered and scored independently, an alternative is to use the *station-to-station* format. This format is often used when assessing large numbers of children. The *station-to-station* format includes setting up separate stations of materials, including all the materials needed for each subscale, with a trained examiner located at each station. Each child proceeds by moving from one subscale station to the next until the assessment process is completed.

Test Administration Considerations

A variety of issues relative to the assessment situation should be considered to help ensure that the results reflect an accurate picture of a child's level of functioning. Several important factors to consider during the administration of the *LAP-D* are described below.

Administration Time

The length of time for administering the *LAP-D* 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 eight subscales for the four domains in about 1-1½ hours. For young children, most assessment sessions should be limited to 30 to 45 minutes. The child should be provided a break, change of activities, and/or extended time interval between sessions. Because optimal 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 subscale 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 distracting 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, it is recommended that the examiner separate the child being assessed from other activities as much as possible. For example, a screen could be placed between the child and the other children/activities in an effort to minimize distractions or the child could be seated facing a wall with his/her back to the rest of the room. 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 environmental items such as stairs or chairs.

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 *LAP-D Assessment 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. If the examiner is the classroom teacher, this relationship will already be established. 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. In the case of an examiner who is unfamiliar to the child (e.g., a resource teacher), the person should introduce himself or herself, play with the child, and talk with the child about the types of activities they will be doing (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.

The examiner should attempt to establish a comfortable 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. Remember, maintaining eye contact while giving instructions helps to keep the child engaged. 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 subscale 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). *A child's obvious inattentiveness or distraction should be noted in the comment column on the LAP-D Scoring Booklet, or in the notes section when using the LAP-D MSA software on your PDA.*

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 unintended 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.

Following Procedures

The reliability of assessment with the *LAP-D* is dependent upon the examiner explicitly following the instructions in the *LAP-D Examiner's 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. Oral instructions to the child are always preceded by "<u>Say</u>" with the specific verbal instructions in quotations and **bold** type. The examiner should say the verbal instructions clearly, maintain eye contact with the child, and avoid monotonous reading of instructions to young children.

Computing Chronological Age

Before beginning the assessment, the child's chronological age must be calculated to determine the appropriate starting point for each subscale. Since the starting points on the *LAP-D* are listed in months, the child's chronological age must be calculated and converted into months using the following rules.

1. Using the left side of the cover page of the *Scoring Booklet* (called Beginning of Year), write the date of assessment and date of birth in standard form as indicated (month/day/year).

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 12/25/2004 is rewritten 2004/12/25.

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, <u>if the days are 15 or more</u>. For examples, see Figures 2a-2c.

Figure 2a Calculating Chronological Age: Simple Subtraction (no borrowing)

	Standard Dates	Converted Dates
Date of Assessment:	10 / 25 / 2005	2005 / 10 / 25
Date of Birth:	4 / 20 / 2001	2001 / 4 / 20
		4 / 6 / 5

Year: __4_ years x 12 =   + 48 months
Month: enter months   =   + 6 months
*(Day: Add 1 month   =   + 0 month
if days are 15 or more)

CHRONOLOGICAL AGE   __54__ months

Figure 2b. Calculating Chronological Age: Borrowing one year and adding a month (because days were 15 or more)

10+12=22

	Standard Dates	Converted Dates
		2004
Date of Assessment:	10 / 25 / 2005	~~2005~~ / ~~10~~ / 25
Date of Birth:	11 / 3 / 2002	2002 / 11 / 3
		2 / 11 / 22

Year: __2_ years x 12 =   + 24 months
Month: enter months   =   + 11 months
*(Day: Add 1 month   =   + 1 month
if days are 15 or more)

CHRONOLOGICAL AGE   __36__ months

Figure 2c. Calculating Chronological Age: Borrowing one month and one year and adding a month (because days were 15 or more)

9+12=21   25+30=55

	Standard Dates	Converted Dates
		2004 9 55
Date of Assessment:	10 / 25 / 2005	~~2005~~ / ~~10~~ / ~~25~~
Date of Birth:	12 / 28 / 1999	1999 / 12 / 28
		5 / 9 / 27

Year: __5_ years x 12 =   + 60 months
Month: enter months   =   + 9 months
*(Day: Add 1 month   =   + 1 month
if days are 15 or more)

CHRONOLOGICAL AGE   __70__ months

Determining Starting Points

Once the chronological age for a child has been converted into months, the starting point for each subscale should be determined. The starting point is the first item in the same developmental age range as the child's chronological age.

1. Begin the assessment at the first item in the same developmental age range as the child's chronological age. In Figure 3, Example A, Jorge's chronological age is 54 months. Since there is a 54-month developmental range, assessment would begin at the first item in that range (e.g., CM14).

2. If the child's chronological age does not match one of the developmental age ranges for a subscale, begin at the first item in the developmental age range *prior* to the child's chronological age. In Figure 3, Example B, Alan's chronological age is 70 months. There is no developmental range for 70 months; therefore, assessment would begin with the first item in the 60 month developmental range, which is the developmental age range, prior to Alan's chronological age (e.g., CM19).

3. Mark the starting point by circling the item number where the assessment should begin on each subscale. See Figure 3 for illustrations.

Determining Starting Points for Children with Disabilities

In the case of children with disabilities, the reports of screening tests and/or other professional diagnostic results may be used to provide information about the child's expected 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 should allow for the establishment of a basal. However, depending on the nature of a child's disabilities, he or she may be able to start at the chronological age level for some subscales that are not affected by the specific disabilities.

Figure 3. Determining Starting Points

JORGE		ALAN	
CA= 54 MONTHS		**CA=70 MONTHS**	
DEV AGE	**ITEM#**	**DEV AGE**	**ITEM#**
18	CM1	18	CM1
24	CM2	24	CM2
24	CM3	24	CM3
24	CM4	24	CM4
24	CM5	24	CM5
36	CM6	36	CM6
36	CM7	36	CM7
42	CM8	42	CM8
42	CM9	42	CM9
48	CM10	48	CM10
48	CM11	48	CM11
48	CM12	48	CM12
48	CM13	48	CM13
54	(CM14)	54	CM14
54	CM15	54	CM15
54	CM16	54	CM16
54	CM17	54	CM17
54	CM18	54	CM18
60	CM19	60	(CM19)
60	CM20	60	CM20
72	CM21	72	CM21
72	CM22	72	CM22
72	CM23	72	CM23
72	CM24	72	CM24

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Scoring Procedures Rules

Once the starting point has been determined, the examiner should turn to the corresponding page of the *Assessment Manual* and locate the appropriate item to begin the assessment.

- If the child meets the scoring criteria of an item, a plus (+) should be recorded to indicate the presence of the behavior. A minus (-) is recorded if the skill is not demonstrated by the child, according to the scoring criteria.

- When recording the child's performance, the examiner must use his or her best judgment in determining whether the child's performance was acceptable in terms of the scoring criteria. *Do not give a child credit for an item if the child does not perform the task, even though the examiner may know that the child can perform the task, or may have seen the child perform the task at some other time.* Record only the behaviors actually observed during the assessment period.

- Record additional remarks in the "Comment" column if an explanation of scoring is necessary. For example, if the child refuses to attempt a task or does not cooperate, record the item as a minus (-) but indicate that the child "refused to do the task" or other such explanation in the "Comment" column.

- When applicable, mark multiple items based on a single administration of an item. Some items within the assessment are administered once but provide for scoring of one or two other items. For example, FW15 requires child to "Add 3 parts to incomplete person." If the child were to add 8 parts, then a plus (+) would be recorded for FW21 but a minus (-) would be recorded for FW25.

Establishing Basals and Ceilings

Because the items on the *LAP-D* are arranged in a hierarchy from least to most difficult, only a subset of items needs to be administered to an individual child to obtain an accurate picture of his/her skill level. Therefore, the LAP-D is designed to be administered using basal and ceiling rules. It is assumed that a child could pass earlier (easier) items before the basal and would not be able to demonstrate later (harder) items after the ceiling. A basal and a ceiling must be obtained for each subscale in order to correctly determine the child's score.

Basal Rules

Establishing or finding the basal simply means determining the point in the assessment where it is assumed that the child could perform all earlier items. This point, the basal, is determined as the first point at which the child successfully performs three consecutive items (i.e., three pluses).

1. Because it is important that the child establish a basal (or initial level of successful functioning), the demonstration of **three consecutive correct items** has been designated as the basal for the *LAP-D*.

2. From the starting point, administer the first item and work forward to obtain a basal.

3. If a minus (-) is obtained before the child achieves three consecutive pluses, work backwards in increments of three items until a basal is established.

4. After the basal is obtained, move forward, administering any omitted items until the ceiling is determined.

5. If a basal cannot be established even though you have worked backward to the first item (the child is functioning below the first item), use the first item in the subscale as the basal. (Note: For children performing below the 30 month level, a more comprehensive picture of their skills may be obtained with the Early LAP, designed for measuring skills of children in the birth to 36 month-old-range.

6. After the basal has been obtained, mark a heavy line above the first item of the basal. It is not necessary to administer any items prior to the basal in order to obtain an accurate score on the *LAP-D*.

In Figures 3a-3b, Jorge's chronological age is 54 months. Examine the basals for each example, indicated by the heavy line.

Figure 3a. Determining the Basal

JORGE #1 CA= 54			JORGE #2 CA= 54			JORGE #3 CA= 54			JORGE #4 CA= 54		
DEV AGE	ITEM	Pre +/-	DEV AGE	ITEM	Pre +/-	DEV AGE	ITEM	Pre +/-	DEV AGE	ITEM	Pre +/-
12	FM1		12	FW1		18	CM1		18	CC1	+
12	FM2		15	FW2		24	CM2		24	CC2	–
18	FM3		18	FW3		24	CM3		24	CC3	
18	FM4		24	FW4		24	CM4		24	CC4	–
21	FM5		24	FW5		24	CM5	+	30	CC5	
24	FM6		30	FW6		36	CM6	+	36	CC6	
24	FM7		30	FW7		36	CM7	+	36	CC7	–
30	FM8		30	FW8		42	CM8	–	36	CC8	+
30	FM9		36	FW9		42	CM9	+	36	CC9	–
30	FM10		36	FW10	+	48	CM10	+	42	CC10	–
36	FM11		36	FW11	+	48	CM11	–	42	CC11	
36	FM12		42	FW12	+	48	CM12	+	42	CC12	
36	FM13		48	FW13	–	48	CM13	–	42	CC13	–
36	FM14		48	FW14	+	54	CM14	–	48	CC14	
36	FM15		48	FW15	+	54	CM15		48	CC15	
42	FM16		54	FW16	–	54	CM16		54	CC16	–
42	FM17		54	FW17		54	CM17		54	CC17	
42	FM18		54	FW18		54	CM18		60	CC18	
48	FM19		54	FW19		60	CM19		60	CC19	
48	FM20		54	FW20		60	CM20		60	CC20	
48	FM21		60	FW21		72	CM21		60	CC21	
54	FM22	+	60	FW22		72	CM22		66	CC22	
60	FM23	+	60	FW23		72	CM23		66	CC23	
60	FM24	+	66	FW24		72	CM24		66	CC24	
60	FM25	–	66	FW25					66	CC25	
66	FM26	–	66	FW26					72	CC26	
66	FM27	–	72	FW27					72	CC27	
72	FM28		72	FW28					72	CC28	

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Figure 3b. Backing Up In Increments

DEV AGE	ITEM	Pre +/-	ORDER OF ADMINISTRATION	DEV AGE	ITEM	Pre +/-	ORDER OF ADMINISTRATION
		JORGE #5 CA= 54				JORGE #6 CA= 54	
15	LN1	+	5th	15	LC1		
15	LN2	+	6th	15	LC2		
24	LN3	+	7th	15	LC3		
24	LN4	–	4th	24	LC4		
36	LN5			24	LC5		
36	LN6			30	LC6	+	7th
36	LN7	–	3rd	30	LC7	+	8th
42	LN8			30	LC8	+	9th
42	LN9			36	LC9	–	6th
48	LN10	–	2nd	36	LC10		
48	LN11			48	LC11	+	4th
48	LN12			48	LC12	–	5th
54	(LN13)	–	1st	48	LC13		
54	LN14			48	LC14	–	3rd
54	LN15			48	LC15		
54	LN16			54	(LC16)	+	1st
54	LN17			54	LC17	–	2nd
60	LN18			60	LC18		
60	LN19			60	LC19		
66	LN20			72	LC20		
66	LN21			72	LC21		
66	LN22			72	LC22		
66	LN23			72	LC23		
72	LN24						

Ceiling Rules

The child's ceiling level of performance is the point above which it is assumed that the child will fail all subsequent items. The examiner should stop the assessment of a subscale when the ceiling is obtained.

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

2. After the third minus (-), count backward to determine if there are three minuses in a five-item span. If not, continue the assessment, counting backward after each minus thereafter to determine if the ceiling has been achieved.

3. In some cases, the basal and ceiling may overlap. (Basal items may be counted as part of the five-item span of the ceiling.)

4. If the child reaches the end of the subscale without accumulating three minuses out of five consecutive items, use the last item of the subscale as the ceiling.

5. Once the ceiling is determined, the examiner should mark a heavy line below the last minus of the ceiling. It is not necessary to administer any further items in the subscale once the ceiling has been obtained to derive an accurate score.

In Figure 4, Jorge's chronological age is 54 months. Examine the ceilings for each example, indicated by the heavy line.

Figure 4. Determining the Ceiling

JORGE # 1 CA=54			JORGE #2 CA=54			JORGE #3 CA=54			JORGE #4 CA=54		
DEV AGE	ITEM	Pre +/-	DEV AGE	ITEM	Pre +/-	DEV AGE	ITEM	Pre +/-	DEV AGE	ITEM	Pre +/-
12	FM1		12	FW1		18	CM1		18	CC1	+
12	FM2		15	FW2		24	CM2		24	CC2	–
18	FM3		18	FW3		24	CM3		24	CC3	+
18	FM4		24	FW4		24	CM4		24	CC4	–
21	FM5		24	FW5		24	CM5	+	30	CC5	+
24	FM6		30	FW6		36	CM6	+	36	CC6	+
24	FM7		30	FW7		36	CM7	+	36	CC7	–
30	FM8		30	FW8		42	CM8	–	36	CC8	+
30	FM9		36	FW9		42	CM9	+	36	CC9	–
30	FM10		36	FW10	+	48	CM10	+	42	CC10	–
36	FM11		36	FW11	+	48	CM11	–	42	CC11	
36	FM12		42	FW12	+	48	CM12	+	42	CC12	
36	FM13		48	FW13	–	48	CM13	–	42	CC13	–
36	FM14		48	FW14	+	54	CM14	–	48	CC14	
36	FM15		48	FW15	–	54	CM15		48	CC15	
42	FM16		54	FW16	–	54	CM16		54	CC16	–
42	FM17		54	FW17		54	CM17		54	CC17	
42	FM18		54	FW18		54	CM18		60	CC18	
48	FM19		54	FW19		60	CM19		60	CC19	
48	FM20		54	FW20		60	CM20		60	CC20	
48	FM21		60	FW21		72	CM21		60	CC21	
54	FM22	+	60	FW22		72	CM22		66	CC22	
60	FM23	+	60	FW23		72	CM23		66	CC23	
60	FM24	+	66	FW24		72	CM24		66	CC24	
60	FM25	–	66	FW25					66	CC25	
66	FM26	–	66	FW26					72	CC26	
66	FM27	–	72	FW27					72	CC27	
72	FM28		72	FW28					72	CC28	

Additional Scoring Rules

1. **Administer all items in the determined range.** All items between the basal and ceiling must be administered on each subscale to obtain a score. If an item cannot be administered because a needed material is not available (e.g., stairs, chairs), the examiner may use other sources of information to obtain a response such as caregiver or parent report. These reports should be used sparingly. It is important to recognize that the most accurate overall picture of the child's skills will be obtained from directly administering items to the child. Any other sources of information should be acknowledged on the *Scoring Booklet* and in subsequent uses of the assessment information for individual planning.

2. **Refusals.** 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. **Spontaneous corrections.** If a child changes his/her response without adult assistance at any time during the administration of an item, the item should be scored based on the last response the child gives.

4. **Language differences**. If a child responds correctly in another language, the score should be recorded as a plus (+), with a comment indicating the response was given in another language and which language the child used.

Chapter 4
Scoring and Interpreting *LAP-D* Results

The rules for computing raw scores and completing the Scoring Summary and Profile are presented in this chapter. The accurate interpretation and communication of assessment results to parents and teachers is vital to their effective application. In this chapter, we also provide some helpful guidelines for interpreting results and applying this information to making decisions concerning young children.

Computing Raw Scores

The raw score for a subscale represents the number of items successfully completed between the basal and the ceiling. All items prior to the basal are counted as correct and all items beyond the ceiling are ignored. After obtaining the basal and ceiling for a specific subscale, the examiner should compute the raw score using the following rules.

1. Write the item number (NOT the developmental age) of the *last* item of the ceiling (i.e., third minus out of five consecutive items) at the bottom of the domain in the row labeled "Last item ceiling."

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

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

4. This number (the raw score) will be used to obtain standard scores from the normative tables in the *Examiner's Manual* & Technical Report.

Figure 5 presents examples of calculating raw scores for Jorge.

Figure 5. Computing Raw Scores

JORGE # 1 CA=54			JORGE #2 CA=54			JORGE #3 CA=54			JORGE #4 CA=54		
DEV AGE	ITEM	Pre +/-	DEV AGE	ITEM	Pre +/-	DEV AGE	ITEM	Pre +/-	DEV AGE	ITEM	Pre +/-
12	FM1		12	FW1		18	CM1		18	CC1	+
12	FM2		15	FW2		24	CM2		24	CC2	–
18	FM3		18	FW3		24	CM3		24	CC3	+
18	FM4		24	FW4		24	CM4		24	CC4	–
21	FM5		24	FW5		24	CM5	+	30	CC5	+
24	FM6		30	FW6		36	CM6	+	36	CC6	+
24	FM7		30	FW7		36	CM7	+	36	CC7	–
30	FM8		30	FW8		42	CM8	–	36	CC8	+
30	FM9		36	FW9		42	CM9	+	36	CC9	–
30	FM10		36	FW10	+	48	CM10	+	42	CC10	–
36	FM11		36	FW11	+	48	CM11	–	42	CC11	
36	FM12		42	FW12	+	48	CM12	+	42	CC12	
36	FM13		48	FW13	–	48	CM13	–	42	CC13	–
36	FM14		48	FW14	+	54	CM14	–	48	CC14	
36	FM15		48	FW15	–	54	CM15		48	CC15	
42	FM16		54	FW16	–	54	CM16		54	CC16	–
42	FM17		54	FW17		54	CM17		54	CC17	
42	FM18		54	FW18		54	CM18		60	CC18	
48	FM19		54	FW19		60	CM19		60	CC19	
48	FM20		54	FW20		60	CM20		60	CC20	
48	FM21		60	FW21		72	CM21		60	CC21	
54	FM22	+	60	FW22		72	CM22		66	CC22	
60	FM23	+	60	FW23		72	CM23		66	CC23	
60	FM24	+	66	FW24		72	CM24		66	CC24	
60	FM25	–	66	FW25					66	CC25	
66	FM26	–	66	FW26					72	CC26	
66	FM27	–	72	FW27					72	CC27	
72	FM28		72	FW28					72	CC28	
			72	FW29					72	CC29	
			72	FW30					72	CC30	
			72	FW31					72	CC31	
									72	CC32	
									72	CC33	
Last item ceiling		27	Last item ceiling		16	Last item ceiling		14	Last item ceiling		10
Subtract		3	Subtract		3	Subtract		4	Subtract		5
Raw Score		24	Raw Score		13	Raw Score		10	Raw Score		5

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Types of Assessment Results

Standard scores. The *LAP-D* yields two primary types of information. First, the *LAP-D* provides standard scores based on normative data, including percentile ranks, Z-scores, T-Scores, Normal Curve Equivalents (NCE), and age equivalent scores. These scores allow for comparisons of skill levels between subscales/domains and help users understand a child's skill development in comparison with other children of similar age and characteristics. Because of the differing number of items in each subscale, raw scores cannot be compared from one subscale to another in a meaningful way. However, standard scores use a common range regardless of the number of items or the developmental age range. For example, a standardized score enables the teacher to compare the similarity and/or difference between the child's performance on one subscale, such as Fine Motor: Writing to another subscale, such as Gross Motor Object: Movement.

Standard scores are useful in determining broad areas or domains in which the child may be having difficulty or in which a child excels. Such information may be useful in identifying children with serious developmental delays or children needing special intervention. The *LAP-D* provides normative information about a child's performance which, when used as a part of a multi-disciplinary assessment, may assist parents and professionals in making decisions about the need for early intervention and the provision of special education and related services. In addition, such information may help teachers with planning and determining goals for classroom instruction.

Specific developmental skill data. A second type of information that may be obtained from *LAP-D* assessment results is specific developmental skill data. By reviewing the scoring of individual items within the subscales, the evaluator or teacher may identify skills a child has mastered, emerging skills, and those skills that are beyond a child's current developmental level. Items that were administered but not demonstrated by the child may serve as a basis for identifying specific short-term objectives for the instructional program. The information derived from the analysis of individual items may be converted into instructional objectives. Such behavioral descriptions derived or adapted from the assessment results provide an excellent foundation for an individualized instructional program. Such information is also useful for the development of an Individual Education Program (IEP) or an Individualized Family Service Plan (IFSP) for children with disabilities. The *LAP-D* cards may be used for reinforcing skill development indicated in IEP or IFSP objectives.

Completing the *Scoring Summary & Profile*

All normative tables for standard scores are contained in the appendices of this manual. On the *Scoring Summary & Profile*, columns have been provided for entering the percentile rank, age equivalent, and standard z-scores, depending on which scores are desired on the summary. The following suggestions are provided to assist the examiner in completing the *Scoring Summary & Profile*. In addition, computer-based software is available that can generate all the information on the *Scoring Summary & Profile*, as well as provide individualized goals and objectives for individual children along with options for reports at the classroom, parent, and site levels. To

complete the *Scoring Summary & Profile*:

1. Complete the demographic and date information at the top of the *Scoring Summary & Profile* by transferring the information from the cover page of the *Scoring Booklet*.

2. Record all scores in the appropriate columns and "triangles" (beg-, mid- or end-of year). It is advisable to use a different color pencil or pen for recording assessment information from each time period, to facilitate comparisons over time.

3. Transfer the raw score from the bottom of each subscale sheet to the appropriate column and "triangle."

4. Use the Percentile Ranks for the appropriate language in the appendices of this manual for determining percentile ranks, and select the table for the correct age group based on the child's chronological age. Locate the appropriate column for each subscale and find the raw score matching the child's raw score. In the *Percentile Rank* column of the *Scoring Summary & Profile*, record the percentile rank from the table that corresponds to the child's raw score.

5. Use Table A-1, in either the English or Spanish appendices of this manual, to locate the percentile rank recorded for a child in each subscale. Record the Z-score corresponding to the percentile rank. Be sure to note plus (+) or minus (-) beside each score.

6. Use the appropriate tables in either the English or Spanish appendices of this manual for the specified subscale for determining age equivalent scores. Locate the child's raw score on the correct age equivalent table and record the corresponding age equivalent score from the table in the *Age Equivalent* column of the *Scoring Summary & Profile*.

7. Mark a "dot" on the approximate location of the corresponding Z-score for plotting the profile. After plotting the Z-score on the profile for each subscale, connect the dots in a line-graph format to illustrate the relative strengths and weaknesses within each subscale (see Figure 6). At different time periods, use different color markers or pencils when drawing profiles for the beg-, mid-, and end-of-year assessments to provide a comparative picture of a child's growth.

Other standard scores such as total percentile ranks or domain percentile ranks may be required for particular programs. These scores are available in both Appendix B and C, depending on the language of the child. Additional scores may be added to the *Scoring Summary & Profile* or to the "Observation and Recommendations" section of the *Scoring Booklet*.

Figure 6. *Scoring Summary & Profile.*

LAP-D
STANDARDIZED ASSESSMENT - SCORING SUMMARY & PROFILE

Child's Name _____ Gender F ____ M ____ Race _____ School/Program _____

Chronological Age in Months Pre:_____ Mid: _____ Post:_____   Date of Assessment Pre:_____ Mid: _____ Post:_____

LAP-D SUBSCALE		Raw Score	Percentile Rank	Age Equivalent In Months	Standard Score Z Score	PILOT PROFILE USING Z SCORES
						-5.0 -4.0 -3.0 -2.0 -1.0 0.0 +1.0 +2.0 +3.0 +4.0 +5.0
Fine Motor: Manipulation	Pre: Mid: Post:					
Fine Motor: Writing	Pre: Mid: Post:					
Cognitive: Matching	Pre: Mid: Post:					
Cognitive: Counting	Pre: Mid: Post:					
Language: Naming	Pre: Mid: Post:					
Language: Comprehension	Pre: Mid: Post:					
Gross Motor: Body Movement	Pre: Mid: Post:					
Gross Motor: Object Movement	Pre: Mid: Post:					

Interpreting *LAP-D* Profiles

The *LAP-D* profile on the "*Scoring Summary & Profile*" is a useful tool for communicating assessment information to both parents and professionals. The shaded area of the profile represents 1.5 standard deviations on either side of the mean. Scores outside of the shaded area indicate performance that is substantially below or above typical performance for a child of that age. While standard scores are often used to assist in the identification of children with disabilities, each program should follow applicable regulations and requirements with regard to the identification of children with disabilities. Additional assessment, observation, and interview information from multiple sources should always be used in conjunction with *LAP-D* standard scores when making decisions regarding the identification or placement of individual children.

The illustrations and explanations for Figures 7-9 may be helpful to the user in interpreting *LAP-D* profiles and planning appropriate instruction.

Figure 7: Shanika's *Scoring Summary & Profile*

LAP-D
STANDARDIZED ASSESSMENT – SCORING SUMMARY & PROFILE

Childs Name *Shanika*   Sex (F) M   Race _____   School/Program *New Program*

Chronological Age In Months   Pre: *49*   Post: _____   Date of Assessment   Pre: *9/24/92* Post: ____

LAP-D SUBSCALE	Raw Score	Percentile Rank	Age Equivalent In Months	Standard Score zScore	PLOT PROFILE USING zSCORES
FINE MOTOR: MANIPULATION	28	99		+2.33	
FINE MOTOR: WRITING	28	99		+2.33	
COGNITIVE: MATCHING	22	99		+2.33	
COGNITIVE: COUNTING	19	90		+1.28	
LANGUAGE: NAMING	21	91		+1.34	
LANGUAGE: COMPREHENSION	19	70		+.52	
GROSS MOTOR: BODY MOVEMENT	24	60		-.71	
GROSS MOTOR: OBJECT MOVEMENT	18	60		-.92	

Interpretation of Shanika's Profile:

Shanika's profile indicates some significant differences between subscales. Though most of Shanika's scores are within the gray area, she has scores greater than 2.0 standard deviations above the mean on three subscales: Fine Motor Manipulation, Fine Motor Writing, and Cognitive Matching. Two other scores are greater than 1.0 standard deviation above the mean: Cognitive Counting and Language Naming. Shanika's lowest scores are in Gross Motor. Overall, it would appear that Shanika has some significant strengths and is well ahead of her peers in many areas. She would likely benefit from an enriched curriculum in these areas. Though Shanika would not appear to have any *significant* problem in Gross Motor, she certainly would benefit from more activities that target her gross motor skills.

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Figure 8: Jorge's *Scoring Summary & Profile*

LAP-D

STANDARDIZED ASSESSMENT – SCORING SUMMARY & PROFILE

Childs Name *Jorge*   Sex F (M)   Race _____   School/Program *New Program*

Chronological Age In Months   Pre: *44*   Post: _____   Date of Assessment   Pre:*9/24/92* Post: _____

LAP-D SUBSCALE	Raw Score	Percentile Rank	Age Equivalent In Months	Standard Score zScore	PLOT PROFILE USING zSCORES
FINE MOTOR: MANIPULATION	20	60		+.25	
FINE MOTOR: WRITING	10	38		-.31	
COGNITIVE: MATCHING	12	44		-.15	
COGNITIVE: COUNTING	7	6		-1.56	
LANGUAGE: NAMING	9	9		-1.34	
LANGUAGE: COMPREHENSION	14	37		-.33	
GROSS MOTOR: BODY MOVEMENT	20	44		-.15	
GROSS MOTOR: OBJECT MOVEMENT	16	54		+.10	

(zScore scale: -5.0 -4.0 -3.0 -2.0 -1.0 0.0 +1.0 +2.0 +3.0 +4.0 +5.0)

Interpretation of Jorge's Profile:

Jorge's scores indicate a significant deficit in Cognitive Counting (1.5 standard deviations below the mean) and a borderline deficit (1.0 standard deviations below the mean) in Language Naming. All other scores are relatively close to the mean or average of his peers. These scores and profile would appear to indicate that Jorge has a problem in one or possibly two areas, but overall there appear to be no major problems or delays. However, Jorge would benefit from a more intensive exposure to counting and language activities.

Figure 9: Alan's *Scoring Summary & Profile*

Interpretation of Alan's Profile:

Alan's scores indicate significant deficits in Fine Motor Manipulation (2.0 standard deviations below the mean) and Language Comprehension (1.5 standard deviations below the mean). In addition, Alan has three scores indicating borderline deficits in Cognitive Counting, Language Naming, and Gross Motor Object Movement. With significant deficits in these subscales, Alan would appear to be in a "high risk" category. Alan's scores suggest the need for special intervention strategies or programs. If other assessment and observation information confirmed these delays, Alan would probably, by many state definitions, be identified as a child with a disability (e.g. developmental delay or developmental disability). *LAP-D* scores would suggest that an IEP should initially focus on long-term goals in Language and in Fine Motor Manipulation. Secondary or future goals might target Cognitive Counting and Gross Motor Object Movement.

Recording Observations and Recommendations

The "Observations and Recommendations" pages of the *Scoring Booklet* are optional. However, these pages may assist the examiner, evaluator, or teacher in recording pertinent information from the assessment that would be useful in planning instructional programs or interventions for the child. This type of information often helps parents understand their child's specific strengths and emerging skills. These comments should focus on information related to understanding the specific developmental skills a child is ready to learn in relationship to his or her chronological age. "Strengths" describe specific skills that the child has mastered (e.g., items on which the child scored a plus). "Needs" should describe emerging skills or skills that the child is ready to learn, but cannot yet perform successfully (e.g., items on which the child scored a minus). "Recommendations" is a general column that could be used to record any other information or recommendations based on the assessment results. The page for "Observations" should be used to record or summarize any observations that might affect interpretation of assessment results. For example, if a child was distracted, very inattentive, and/or refused to attempt several tasks, such information should be noted under "Observations" to alert others reviewing the information about other factors that might have affected the child's performance.

Developing Individual Goals and Objectives

LAP-D assessment results can facilitate the development of goals and objectives for individualized instruction and/or the development of an Individualized Education Plan (IEP) or an Individualized Family Service Plan (IFSP). The *LAP-D* subscales represent the primary domains of early childhood development and thus are appropriate for identifying long-term goals in specific areas (e.g., Fine Motor: Manipulation, Language: Comprehension, etc.). Individual assessment items provide guidance in developing of short-term objectives. The following suggestions may assist in the utilization of *LAP-D* assessment results for individualized instruction.

Select Long-term Goals. A review of the *Scoring Summary & Profile* will help the examiner or teacher identify broad developmental areas (subscales) that are a need or a strength (e.g., long-term goals). Generally, areas of need indicated by standard scores well above or well below the mean should be the foundation for developing long-term goals.

Identify Short-term Objectives. For each subscale selected as a long term goal, the examiner or teacher should review the child's individual item responses within each subscale to determine short-term objectives. Often the items for which a child receives a minus (-) indicate an emerging skill. The two or three items following the ceiling may also be appropriate for developing short-term objectives.

Evaluation criteria for short-term objectives. The procedure and scoring criteria within the Assessment Manual give guidance for evaluating short-term objectives. Pre- and post-assessment procedures may be useful in determining progress toward achieving short-term objectives.

Communicating Assessment Results to Parents

It is the right of the parents to be honestly informed of the results of any formal evaluation of their child. The manner in which these results are communicated is very important, for they can either enlighten and involve the parents, or alienate them and increase their anxiety about their child's growth and development.

Several principles should guide evaluators in their contact with parents. Assessment results should, whenever possible, be communicated in a face-to-face conference. Parents may have questions and concerns that are difficult to express in written communications. The conference can be a rewarding experience for all concerned if the following suggested guidelines are observed.

Establish rapport. Spend some time in pleasant conversation. Parents are often intimidated by conferences about their child, perhaps because schools are more likely to contact the parents when there is some difficulty with the child than when things are going well. Such a conference can be a good opportunity to establish a cooperative relationship with parents.

Describe the type of information the assessment measures. For example, parents should know that the *LAP-D* assesses children's developmental skills. The areas measured by the *LAP-D* are straightforward and easily understandable. Because the child's strengths are clearly observable, attention should be focused on those skills the child has demonstrated as well as those that are emerging and/or lagging. Parents should be aware that the *LAP-D* measures those skills generally acquired during the preschool years.

Seek the parents' estimate of their child's developmental progress. Parents are often accurate in their appraisal of their child's skills, although they may or may not have broader conceptual knowledge about typical developmental sequences. Ask the parents about the child's activities at home. Should the parents' estimates coincide with assessment results, it is expected that the parents will gain confidence in the accuracy of the evaluation. This confidence may enable them to listen with a greater degree of acceptance to an explanation of areas of possible disagreement.

Seek verification of assessment results. Absolute confidence in the accuracy of an assessment can never be achieved. Ask parents to confirm or question the results of the evaluation. Parents may explain the circumstances under which a certain behavior is observed, and provide advice in the interpretation of results. This process should afford a more complete picture of the child and prevent inaccurate assumptions.

Avoid labels. Parents are best informed when they are made aware of the strengths of the child, for it is on these strengths that the instructional program rests. By sharing positive results with the parents, the support and assistance of the parents can be enlisted. Discuss facts, not theories, with parents. The *LAP-D* measures observable behaviors. The goal is the facilitation of development at its optimal level. A behavioral description of obtained results is informative and useful.

Interpret normative data appropriately. When interpreting normative data to parents, it is important that the evaluator have a clear understanding of standard scores and their limitations. Although norms are important as yardsticks of developmental stages, they must be used cautiously.

Provide a written summary of the assessment. Because it is difficult to remember and process a wide array of data, a written summary, similar to the report given to the teacher, should be given to the parents. Parents will then be able to consider the report and raise questions later.

Provide suggestions for cooperation between home and school. With assistance, parents can be enlisted as colleagues in the provision of appropriate developmental activities for the child. The assessment of behaviors is not an end in itself. Parents should not see it as a terminal process, but rather as the means by which appropriate instructional strategies are devised for the child. Along with a statement of the child's strengths and his immediate learning goals, the evaluator should provide the parents with suggestions for supplementing the formal instructional program at home.

Assure confidentiality. Assure parents of your commitment to the ethical standards that underlie the use of assessment procedures. Parents should feel confident that the child's and family's right to privacy are being maintained and that no assessment results or diagnostic reports will be disseminated in a manner which could cause harm to the child. The evaluator must assume responsibility for guarding against any misuse or misinterpretation that could result from failure to protect the rights of the individual and/or possible misuses of assessment results (labeling, unfair placement, unrealistic expectations, and so forth).

Ethnical Use and Interpretation of Assessment Results

The ethical standards that apply to the use of assessments are the safeguards against their misuse. Whether or not a code of ethics governing the use of assessment results has legal bearings on the evaluator, a few guidelines ought to be incorporated into one's *modus operandi.* Kirby et al. (1973) suggest adherence to the ethical standards set forth by the American Personnel and Guidance Association. Paraphrasing the American Personnel and Guidance Association, these standards state, among other things, that:

1. The results of an individual assessment should be viewed in perspective, that is, as constituting only one facet of a total evaluation. The evaluator should see that undue emphasis is not placed on the results of a "single" assessment.

2. When communicating the results of assessments, the evaluator should avoid making false claims about the implications of the child's performance. In other words, the information the assessment provides should be clearly designated as a limited evaluation of the individual.

3. The evaluator should recognize his/her own competence level and should not attempt to perform functions that are clearly beyond that level. This manual generally states the degree

of training and experience required for a reliable and accurate administration of an assessment. The evaluator should ensure that he/she has the necessary qualifications to perform this task.

4. The evaluator should ensure that the assessment is administered according to the procedures followed during the standardization process. In the case of the *LAP-D*, this means that the examiner should adhere to the general procedures specified in this manual and the specific procedures for each item as described in the *Examiner's Manual*, including using the materials designed exclusively for use with the assessment. Any departure from these procedures is not suggested and will reduce the accuracy of the results; if any occurs, it should be clearly reported in the communication of assessment results.

5. The examiner must never coach or tutor the child prior to the administration of the assessment. Assessment materials should not be reproduced and presented to children outside the assessment situation.

6. Parents should be clearly informed of the purpose of the evaluation, and they should determine who should share in the results of the assessment.

7. The evaluator should respect the copyright of an assessment and should not modify or reproduce parts without the written approval of the publisher.

8. The evaluator should respect the individual's right to privacy.

Chapter 5
Methodology and Procedures for the *LAP-D*
Reliability and Validity Study

Overview of Study

To re-norm the *LAP-D* in English and establish norms in Spanish, a sample of 2099 children were recruited to participate in the reliability and validity studies. Four types of studies were conducted as described below.

- **Construct validity** examines the extent to which an instrument functions as a coherent measure. Construct validity of the *LAP-D* was measured in four ways: 1) by examining the intercorrelations among different subscales of the *LAP-D*; 2) by determining the internal consistency coefficients for the overall scale and for each subscale; 3) by calculating the Standard Errors of Measurement for the overall scale and for each subscale by age group; and, 4) by examining the relations between chronological age and developmental age for the overall scale and for each subscale. In addition, differential item functioning analyses were conducted for each item on the two versions of the *LAP-D* (English and Spanish) to determine whether any items were biased. Item-level comparisons of the scores for the two different versions were made, adjusting for differences in ability based on the scores on the criterion validity instruments.

- **Criterion Validity**, also called concurrent validity, examines the correspondence between individual scores on an instrument with scores on a similar instrument. A sample of children was administered both the *LAP-D* and one of two other norm-referenced instruments (i.e., appropriate subscales from the Woodcock-Johnson Tests of Achievement or the DIAL-3, a screening instrument) in two sessions in close proximity (1-3 weeks apart). Each child was administered both assessments in their primary language only (English or Spanish). The children in this sample were representative of a range of age levels and included children with typical and atypical development, so that criterion validity could be examined overall as well as for these different groups. The associations between the scores on the two different measures, calculated separately for each language group, were examined to determine whether children scored similarly on the *LAP-D* and the criterion measure. In addition, comparisons of the pattern of association for each language group were examined to determine if the patterns were similar.

- **Test-Retest Reliability** indicates the extent to which scores on a measure are consistent from one time period to the next when administered by the same individual. Because the LAP-D measures a continuum of progressively more advanced developmental skills, the test-retest reliability was measured over a short period of time so that any difference between administrations were more likely to reflect reliability rather than development. The *LAP-D* was administered and then re-administered by the same examiner in two

sessions, one to three weeks apart, to a sample of children representing various age groups and including both normally and atypically developing children. Test-retest reliability was determined by examining the correlations between scores from the first and second administrations by developmental domain and by age, separate within each language group. In addition, comparisons of the pattern of association for each language group were made to examine whether the results were similar for the English and Spanish versions.

- **Interrater Reliability** measures the extent to which different examiners agree in their assessment of a single individual. The results of this instrument should reflect the developmental skills of the child independent of the particular person administering the assessment, assuming proper procedures have been followed. In order to determine the level of interrater reliability, a sample of children was administered the *LAP-D* by two different examiners in the same setting in consecutive sessions, one to three weeks apart. The sample of children in the interrater reliability study was representative of various age levels and included children with typical and atypical development. Interrater reliability was determined by examining the correlations for each developmental domain. In addition, comparisons of the pattern of association for each language group were made to examine whether the results were similar for the two versions.

In addition to the reliability and validity studies, normative scores for the *LAP-D* were determined based on the age groups. Five types of normative scores were calculated based on the entire study sample, excluding children with disabilities, with separate calculations conducted for the English and Spanish versions including: 1) percentile ranks, 2) age-equivalent scores, 3) *z*-scores, 4) *t*-scores, and, 5) normal curve equivalents (NCE).

Spanish Translation/Adaptation of the *LAP-D*

Translation/Adaptation. To translate/adapt the *LAP-D* into Spanish, the consensus method was used, a multi-step process in which translators and reviewers reconcile differences and reach consensus to achieve the best possible translation/adaptation. In this study, the consensus group included the project co-directors, a primary translator, a technical editor, and a review committee representing a total of seven different Spanish-speaking countries. The primary translator had overall responsibility for the translation. After completing the initial translation, a second translator (technical editor) reviewed it for consistency of terms and phrases as well as grammar and spelling. Next, copies were distributed to a committee of reviewers composed of native speakers with knowledge and/or training in early childhood education or a related field. The review committee was asked to submit written comments as to whether the wording of the translation/adaptation accurately reflected the content and intent of the original instrument. Conference call meetings were held to reconcile differences and come to consensus on the pilot test version of the translated/adapted instrument.

Pilot study. Once the translation/adaptation was completed, a pilot study was conducted with 92 children in Miami-Dade County, Florida. The sample included 49 English-speaking children and 43 Spanish-speaking children. Each child was administered the *LAP-D* in the appropriate

language and the *Peabody Picture Vocabulary Test-III (PPVT)* or *Test de Vocabulario en Imagenes Peabody (TVIP)*. A series of analyses were conducted to determine the validity of the translation and the appropriateness of each item.

- The patterns of association between chronological ages and raw scores on the *LAP-D* for each language group were compared to determine whether the Spanish and English versions of the *LAP-D* were appropriately and similarly measuring changes associated with age.

- The associations between the *LAP-D* and *PPVT-III/TVIP* raw scores were compared for each language group to determine whether the Spanish and English versions of the *LAP-D* exhibited similar patterns of association relative to a criterion measure.

- Differential item functioning analyses were conducted for each item on the two versions of the *LAP-D* (English and Spanish) to determine whether any items were biased. Item-level comparisons of the scores for the two different versions were made, adjusting for differences in ability based on the overall *LAP-D* scores.

For the first set of analyses, correlations were computed between chronological age and raw scores on the LAP-D total and subscale scores for each language group. The results of these comparisons indicated that the correlations were similar for the two different versions of the measure for the total scores (English r=.88, Spanish r=.96) and subscale scores (English r= .74-.90, Spanish r= .70-89), suggesting that the pilot versions of the LAP-D were appropriately capturing differences associated with age for both language groups.

For the second set of analyses, correlations between the *LAP-D* subscale raw scores and *PPVT-III/TVIP* total raw scores were computed for the English and Spanish samples to examine whether the Spanish version of the *LAP-D* was performing similarly to the English version based on correspondence with an established criterion measure. These results suggested that the two versions of the *LAP-D* were performing similarly on most subscales, with differences in the magnitude of the correlation for the two language groups of less than .20. The one exception was the Letter Naming subscale in the Language domain, which exhibited a higher correlation for the English sample (r=.87) than the Spanish sample (r=.60).

For the third set of analyses examining differential item functioning, the proportion of children with correct scores on each item was compared between the two language groups, adjusting for children's overall level of functioning, in order to determine whether any items were biased. The total sample was divided into three groups based on total LAP-D scores, the lower tercile (total score=31-94), the middle tercile (total score=95-158), and the upper tercile (total score=159-221), and the proportion of children with correct scores on each item was compared for the English and Spanish samples. Similarly to the second set of analyses, the two language versions performed similarly on most items except for several items on the Letter Naming subscale in the Language domain. Approximately half of the items in this subscale exhibited substantial differences in the proportion of correct scores between the two age groups, and the Spanish translation of these items was re-examined for accuracy, consistency across different ethnic groups, and item difficulty.

Changes were made to the translation/adaptation as indicated by the results of these analyses to form the field test version of the Spanish *LAP-D* for the norming study.

Item Analysis for the Norming Study

After the norming study was completed, analyses were conducted to examine item difficulty to determine whether each item was appropriately placed on the LAP-D for both language versions. For each item on the *LAP-D*, the following calculations were performed for each language group:

- The number/percentage of children asked each item.

- The number/percentage of children who scored correctly on each item (counting pre-basal items as correct and post-ceiling items as incorrect).

- The number/percentage of those children administered each item who scored correctly (ignoring pre-basal and post-ceiling items).

- The number/percentage of children in the corresponding chronological age range for each item who were administered the item and who scored correctly (ignoring pre-basal and post-ceiling items).

The results for the English and Spanish samples were compared to insure that the two language versions of the *LAP-D* performed similarly. Additionally, the data from an English/Spanish field test sample of more than 1000 children drawn from the Red-e Set Grow database were used to confirm perceived patterns. Items where the number and/or percentage of children who correctly answered items appeared either inordinately high or low compared to surrounding items were flagged.

In order to preserve the correspondence between the English and Spanish versions of the *LAP-D*, changes in item placement were made only when it was deemed appropriate for both versions. The results of these analyses indicated that 23 (10%) of the items were placed incorrectly in terms of difficulty level relative to other items in the subscale. Accordingly, the placement of these items was changed on the final version of the *LAP-D*, with 14 (6%) of items moved within a chronological age category and 9 (4%) moved to different age category.

Methods

To investigate the reliability and validity of the *LAP-D*, a sample representative of the United States was selected based on U.S. Census 2000 data (U.S. Census Bureau, Census 2000; U. S. Census Bureau, Current Population Survey, March 2000). The project sample for the standardization study included 2099 children ages 30 to 72 months old. Of these 2099 children, 2022 were children with typical development, and 77 were children with professionally diagnosed disabilities. The sample of atypically developing children was included to examine whether the *LAP-D* could be used appropriately with children with disabilities. A stratified

sampling procedure was used based on language, geographic region, age, race, gender, and type of setting as described below.

Geographic Distribution of Project Sites

Four geographic areas were selected to represent the geographic regions of the United States: Northeast (Boston, Massachusetts), South (Orange and Wake Counties, North Carolina and Miami-Dade County, Florida), Central (Faribault Area, Minnesota), and Southwest (San Antonio, Laredo, and Austin Areas, Texas). The site in the Northeast represented approximately 5% of the sample (*n* = 91), while the remainder of the sample was fairly evenly distributed among the other three geographic areas (South, 32.5%; Central, 32.0%; Southwest, 30.6%). The distribution of the sample by language and geographic region is illustrated in Table 2.

Table 2. Distribution of Project Sample by Geographic Area and Language (*N=2099*)

Geographic Area	English Sample		Spanish Sample		Project Sample	
	n	*%*	*n*	*%*	*n*	*%*
Northeast	91	4.3	13	0.6	104	4.9
South	330	15.7	352	16.8	682	32.5
Central	354	16.9	317	15.1	671	32.0
Southwest	349	16.6	293	14.0	642	30.6
Total	1124	53.5	975	46.5	2099	100.0

Participant Characteristics

Age and Gender

Children were recruited from the following seven age categories: 30-35 months, 36-41 months, 42-47 months, 48-53 months, 54-59 months, 60-65 months, and 66-72 months. Table 3 shows the distribution of the project sample by age for each language group and the total project sample.

Table 3. Mean Age (in months) and Standard Deviations by Age Category and Language for the Project Sample (N=2099)

Age Category	English Sample			Spanish Sample			Total Project Sample		
	n	*M*	SD	*n*	*M*	SD	*N*	*M*	SD
30-35 months	100	33.1	1.6	78	32.3	1.7	178	32.7	1.7
36-41 months	124	38.7	1.7	92	38.9	1.7	216	38.8	1.7
42-47 months	180	44.9	1.7	124	44.8	1.6	304	44.8	1.7
48-53 months	181	50.6	1.9	200	50.6	1.7	381	50.6	1.8
54-59 months	217	56.7	1.6	184	56.6	1.7	401	56.6	1.7

60-65 months	183	62.4	1.8	194	62.6	1.8	377	62.5	1.8
66-72 months	139	68.8	2.1	103	68.4	1.9	242	68.6	2.0
Total	1124	52.15	10.95	975	52.7	10.5	2099	52.4	10.8

An approximately equal number of males and females were selected for the sample. Table 4 shows the distribution by gender for each language group and the total project sample.

Table 4. Number and Percent of Sample by Age Category, Gender, and Language (*N*=2099)

	English Sample				Spanish Sample				Total Project Sample			
	Females		Males		Females		Males		Females		Males	
Age Category	*n*	*%*	*n*	*%*	*n*	*%*	*N*	*%*	*n*	*%*	*n*	*%*
30-35 months	51	51.0	49	49.0	38	48.7	40	51.3	89	50.0	89	50.0
36-41 months	62	50.0	62	50.0	48	52.2	44	47.8	110	50.9	106	49.1
42-47 months	93	51.7	87	48.3	64	51.6	60	48.4	157	51.6	147	48.4
48-53 months	90	49.7	91	50.3	111	55.5	89	44.5	201	51.5	180	48.5
54-59 months	99	45.6	118	54.4	101	54.9	83	45.1	200	49.9	201	50.1
60-65 months	95	51.9	88	48.1	99	51.0	95	49.0	194	51.5	183	48.5
66-72 months	63	45.3	76	54.7	59	57.3	44	42.7	122	50.4	120	49.6
Total	553	49.2	571	50.8	520	53.3	455	46.7	1073	51.1	1026	48.9

Race/Ethnicity

To represent the variety of cultural and ethnic groups in the United States, English-speaking children were proportionally selected for the sample to reflect the major racial/ethnic groups indicated in the 2000 U.S. Census (2000). 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 children who were described as bi-racial by their parents. Table 5a depicts the racial/ethnic distribution by geographic region for English-speaking children.

Table 5a. English-Speaking Sample by Race/Ethnicity and Geographic Region (*n*=1124)

	Central	Northeast	South	Southwest	Total[2]	
Racial/Ethnic Group	*n*	*n*	*n*	*n*	*n*	*%*
African American	16	17	38	59	130	11.6
American Indian, Eskimo, and Aleut	4	0	0	7	11	1.0
Asian and Pacific Islander	3	1	10	6	20	1.8
Hispanic Origin	32	21	88	174	315	28.0

White	281	48	141	69	539	47.9
Other[1]	18	4	53	34	109	9.7
Total	354	91	330	349	1124	100.0

[1] Children classified as "Other" were reported according to the following distribution: "other" n=22 (1.96%); "two or more races/ethnicities" n=66 (5.87%); "unknown" n=17 (1.51%).
[2] The 2000 US Census Bureau population estimates were: African American$n$=12.3%; American Indian and Alaskan Native=0.9%; Asian, Native Hawaiian, and Pacific Islander=3.7%; White=75.1%; Other=7.9%. In addition, the US Census 2000 population estimates include 12.5% Hispanic/Latino in the general population.

To represent the variety of cultural and ethnic groups within the Latino population of the United States, Spanish-speaking children were proportionally selected for the sample to reflect the major cultural backgrounds groups indicated in the 2000 U.S. Census (2000, 2001). These groups included the following categories: Central and South American, Cuban, Mexican, Puerto Rican, and "other" Hispanic. For the purposes of this research, the mother's country of origin was used to determine cultural background. If the mother's country of origin was not available, the father's country of origin was used. Table 5b depicts the cultural background distribution by geographic region for Spanish-speaking children.

Table 5b. Spanish-Speaking Sample by Cultural Background and Geographic Region (n=975)

	Central	Northeast	South	Southwest	Total[2]	
Cultural Background	*n*	*n*	*n*	*n*	*N*	*%*
Central and South American	31	0	109	7	147	15.1
Cuban	0	0	28	0	28	2.9
Mexican	181	0	70	169	420	43.1
Puerto Rico	0	3	10	1	14	1.4
Other[1]	105	10	135	116	366	37.5
Total	317	13	352	293	975	100.0

[1] Cultural backgrounds classified as "Other" were reported according to the following distribution: "not reported" n=330 (32.8%); "Dominican Republic" n=10 (1.0%); "Other" n=26 (2.67%).
[2] The 2000 US Census Bureau population estimates were: Central and South American=8.6%, Cuban=3.5%, Mexican=58.5%, Puerto Rican=9.6%, Other Hispanic=19.8%.

Family Characteristics

Parents were asked questions about family characteristics, including family composition, parental educational levels, income level, and home languages. Table 6 depicts the distribution of the number of adults and children in the home for each language group and the project sample. These results suggest that children in the Spanish-speaking sample tended to live in homes with slightly larger numbers of adults and children.

Table 6. Adults and Number of Children Living in Home by Language Group for Project Sample (*n*=2099)

Type of Family Member	English Sample		Spanish Sample		Total Project Sample	
	n	*%*	*n*	*%*	*N*	*%*
Number of Adults in Home						
1	188	17.8	90	10.1	278	13.2
2	760	71.8	572	64.3	1332	63.5
3 or more	110	10.4	228	25.6	338	16.1
Not reported	-	-	-	-	151	7.2
Number of Children in Home						
1	245	23.9	134	15.3	379	18.1
2	441	43.1	321	36.7	762	36.3
3 or more	338	33.0	554	48.0	892	42.5
Not reported	-	-	-	-	66	3.1

Table 7 depicts the distribution of household income for the total project sample and within each language group. Of the 1,617 families who reported annual income, a somewhat higher proportion of Spanish-speaking children were from low-income homes than English-speaking children.

Table 7. Household Income Reported for Project Sample and by Language Group (*n*=1617)[1]

HH Income Level[2]	English Sample		Spanish Sample		Total Project Sample	
	n	*%*	*n*	*%*	*N*	*%*
Under $10k	126	7.78	159	9.83	285	17.63
$10k-$20k	155	9.59	263	16.30	418	25.85
$20k-$30k	108	6.68	131	8.10	239	14.78
$30k-$40k	77	4.76	48	2.97	125	7.73
$40k-$50k	75	4.64	27	1.67	102	6.31
$50k-$60k	62	3.83	7	0.43	69	4.27
$60k-$70k	76	4.70	1	0.001	77	4.76
$70k-$80k	92	5.69	7	0.43	99	6.12
$80k+	179	11.1	24	1.48	203	12.55
Total	950	58.8	667	41.2	1617	100.00

[1] 1617 of the 2099 families in the project sample reported household income.

[2] The 2000 US Census reports the median household income for all races as $43,052, for Hispanics and Latinos of any race as $33,946.

Parents were asked to indicate the highest education level completed. Table 8 shows the distribution of highest education level completed for mothers and fathers separately for each language group and the total project sample. This distribution is consistent with U.S. Census reports (2000), which indicate lower literacy and high school completion rates among the Latino population than among African-American and White populations.

Table 8. Highest Grade Completed of Mothers and Fathers by Language for Project Sample (*n*=2099)

	English Sample[1]				Spanish Sample[2]				Total Project Sample			
	Mother		Father		Mother		Father		Mother		Father	
Highest Grade	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*N*	*%*
< High school	113	10.1	98	8.7	391	34.8	346	35.5	504	24.0	444	21.2
High school	369	32.8	356	31.7	278	24.7	251	25.7	647	30.8	607	28.9
Associates degree	191	17.0	133	11.8	87	7.7	79	8.1	278	13.2	212	10.1
Bachelors degree	242	21.5	207	18.4	43	3.8	28	2.9	285	13.6	235	11.2
Masters degree	103	9.2	76	6.8	10	0.9	12	1.2	113	5.4	88	4.2
Doctoral degree	12	1.1	18	1.6	2	0.2	3	0.3	14	0.7	21	1.0
Not reported	94	8.4	236	21.0	164	14.6	256	26.3	258	12.3	492	23.4
Total	1124	100.0	1124	100.0	975	100.0	975	100.0	2099	100.0	2099	100.0

[1]The 2000 US Census reports the following percentages for highest education level completed for all races/ethnicities: less than high school, 10.5%; high school diploma/GED, 31.8%; Associates degree, 7.7%; Bachelors degree, 16.4%; Masters degree, 5.5%; Doctoral degree, 1.0%. (Additional categories include: Some college/no degree, 19.2%; Professional degree, 1.3%.)

[2]For Hispanics and Latinos of any races, the populations percentages were as follows: less than high school, 42.7%; high school diploma/GED, 28.4%; Associates degree, 4.8%; Bachelors degree, 7.0%; Masters degree, 1.6%; Doctoral degree, 0.3%. (Additional categories include: Some college/no degree, 14.6%; Professional degree, 0.6%.)

Program Types

Children were recruited from a variety of different settings. The primary types of settings were: center-based child care programs (*n* = 65, 50.0%), including developmental day, day care, and preschool programs; Head Start programs (*n* = 24, 18.5%); private schools (*n* = 19, 14.6%); public schools (*n* = 12, 9.2%); and other settings such as WIC (n=10, 7.7%). A total of 130 programs/schools participated in the study, with some variation in the types of settings across the four geographic regions. For example, the Northeast site included a Head Start program, two center-based facilities, and one public school system. In the South, three community child care centers, nine Head Start programs, 17 private schools, and one public school system participated in the study. The participants in the Central site included 11 center-based programs, eight Head Start programs, six public schools, and two private schools. The Southwestern site was composed of 22 center-based programs, eight Head Start programs, and four public schools. The WIC and other miscellaneous types of settings were spread across the four geographic regions.

Measures

This section describes the various measures used in the standardization study of the LAP-D.

Prior to selection of the criterion measures, the researchers consulted the publishers of each assessment for recommendations on which versions of both English and Spanish measures would be most appropriate in this study. In all instances, those recommendations were followed. The following information describes the assessments selected and their uses in this study.

Developmental Indicators for the Assessment of Learning, Third Edition (DIAL-3)

The *DIAL-3* (Mardell-Czudnowski, C. & Goldenberg, D. S., 1998) is a norm-referenced screening instrument that assesses child development in the following areas: Motor, Concepts, Language, Self-Help, and Social. The Motor Concepts and Language scales were used in the present study because the Self-Help and Social components of the DIAL-3 are not norm-referenced and were not used in the study. The measure is available in English and in Spanish and is appropriate for use with children from 36 to 83 months of age. The *Dial-3* has good reliability, with internal consistency coefficients ranging from .66 to .87 and test-retest coefficients ranging from .67 to .88.

Peabody Picture Vocabulary Test, Third Edition (PPVT-III)

The *PPVT-III* (Dunn, L.M., & Dunn, L.M., 1997) is a norm-referenced instrument designed to assess receptive vocabulary from age 30 months to 90+. The measure consists of 204 items administered in sets of 12 items each. The *PPVT-III* has excellent reliability, with internal consistency coefficients ranging from .92 to .98 and test-retest coefficients ranging from .91 to .94.

Test de Vocabulario en Imágenes Peabody (TVIP)

The *TVIP* (Dunn, L.M., Lugo, D.E., Padilla, E.R., & Dunn, L.M., 1986) is the Spanish version of the *Peabody Picture Vocabulary Test* (PPVT-III) for use with Hispanic Americans and is based on the *PPVT-R*. The *TVIP* is a norm-referenced instrument designed to quickly assess receptive verbal ability from age 30 months to 18 years. Unlike the *PPVT-III*, the 125 items in the *TVIP* are administered in sequential order without sets. The measure has excellent reliability, with internal consistency coefficients ranging from .80 to .94.

Woodcock-Johnson Psycho-Educational Battery-Revised (WJ-R)

The *Woodcock-Johnson Psycho-Educational Battery-Revised* (*WJ-R*) (Woodcock, R.W., & Johnson, M.B., 1989) is a norm-referenced battery of tests used to assess a range of cognitive abilities. Three tests from the *Standard Battery* were used in this study. Those included Letter-Word Identification, Applied Problems, and Dictation. The *WJ-R* has excellent reliability and validity, with internal consistency coefficients averaging in the mid .90s.

Batería Woodcock-Johnson-Muñoz (Batería-R)

The *Batería-R* (Woodcock, R.W., & Muñoz-Sandoval, A.F., 1990), the Spanish version of the *WJ-R*, is a norm-referenced battery of tests used to assess a range of cognitive abilities in the Spanish-speaking population. Three tests from the *Batería Suplementaria* corresponding with the

Letter-Word Identification, Applied Problems, and Dictations tests on the English version of the *WJ-R* were used in this study. The *Batería-R* has very good reliability, with internal consistency coefficients ranging from the mid .80s to the high .90s.

Parent Questionnaire

A parent questionnaire was distributed with the permission letters. The parent questionnaire contained basic demographic information required for participation in the study (e.g., child birth date, gender, ethnicity), and other child background information (e.g., primary language, family income, parents' education).

Procedures

A team of thirty professionals (six recruitment coordinators and 24 additional data collectors), trained and supervised by the project co-directors, recruited participants and collected the data. Each examiner had a college degree in education, developmental psychology, or another related field. The examiners participated in a two-and-a-half day training session on the data collection procedures and administration procedures for the *LAP-D*, *Dial-3, PPVT-III /TVIP,* and *WJ-R/Batería-R* in the winter of 2002.

A total of 2099 children participated in the study from four geographic regions across the United States. Children were recruited through contact with child care centers, Head Start, public schools, private schools, and individual families within each of the four regions. An effort was made to include settings representing children from a range of socioeconomic groups. Each program administrator (center director or principal), teacher, or parent in the case of home settings, was contacted in person or by phone and recruited to participate in the study. Copies of the *LAP-D Scoring Booklet* and letters describing the study and requesting consent to participate were shared and discussed during a subsequent meeting. In the case of child care, Head Start, and public school programs, program administrators or teachers were asked to distribute and collect permission forms for parents interested in participating in the study. After the children were recruited, each examiner was responsible for scheduling assessment visits with the appropriate individual, completing the assessments, and submitting completed protocols to the project co-directors.

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

Of the 2022 children in the core sample, 1960 children (93.4%) of the core sample were administered both the *LAP-D* and the *PPVT-III/TVIP*, either during the same testing session or in two sessions in close proximity. In addition, 197 children (9.7%; n=85 for the English sample and n=112 for the Spanish sample) were administered both the *LAP-D* and the Dial-3 and an

additional 409 children (19.5%; n=231 for the English sample and n=178 for the Spanish sample) were administered both the *LAP-D* and the *WJ-R* or *Batería-R*. These assessments were administered during the same testing session or in two sessions in close proximity.

A second *LAP-D* was given to 465 typically developing children for the test-retest (*n=318*) or interrater reliability (*n=147*) studies. The children participating in these two studies reflected a similar distribution in geographic region, age, gender, race/ethnicity, and language to the overall sample. The test-retest sample included 163 English-speaking and 155 Spanish-speaking children. The interrater reliability sample included 58 English-speaking and 89 Spanish-speaking children.

Because the *LAP-D* measures a continuum of developmental skills, the test-retest and interrater reliability were measured over a short period of time so that any differences between administrations were more likely to reflect reliability rather than individual development. For the test-retest reliability study, the same examiner administered the *LAP-D* on two separate occasions, one to three weeks apart. For the interrater reliability study, two different examiners administered the *LAP-D* on two separate occasions, one to three weeks apart.

Chapter 6
Statistical Properties of *LAP-D*

In this chapter, the results of the standardization studies are described. Every effort was made to gather complete data for each child; however, in some cases, missing items prevented calculation of a subscale score for individual children. In most cases, the missing data were caused by the inability to observe particular behaviors due to the unavailability of large structural materials (e.g., stairway).

Total raw scores on the LAP-D were calculated for the different age categories within the core sample. The mean total raw scores for the core sample (children with typical development from 30 to 72 months old, *n*=2022) ranged from 66.03 (SD=17.92) to 195.33 (SD=17.83). The means were slightly higher for English-speaking children (*n*=1075), ranging from 71.32 (SD=15.98) to 199.95 (SD=16.99), than for Spanish-speaking children (*n*=947) whose means ranged from 59.31 (SD=18.11) to 189.63 (SD=17.24). Table 9 depicts the total raw score means across domains for each language group and for the core sample by age category.

Table 9. Total Raw Score Means[1] and SDs by Language Group and Age Category (*n*=2022)

Age Category	English Sample		Spanish Sample		Core Sample	
	M	SD	*M*	SD	*M*	SD
30-35 mos	71.32	15.98	59.31	18.11	66.03	17.92
36-41 mos	96.18	20.94	84.52	17.59	91.23	20.38
42-47 mos	120.09	20.76	108.12	16.63	115.28	20.03
48-53 mos	140.54	19.90	129.91	16.92	134.94	19.12
54-59 mos	162.21	21.43	150.49	16.00	156.78	19.96
60-65 mos	181.62	19.23	172.31	15.41	176.70	17.91
66-72 mos	199.95	16.99	189.63	17.24	195.33	17.83

[1]Possible scores ranged from 0 to 226.

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 of the *LAP-D* were conducted for each domain, including examination of the correlations with age, internal consistency, standard errors of measurement, test-retest reliability, and interrater reliability.

Correlations Between Chronological Age and *LAP-D* Raw Scores

The correlations between the *LAP-D* raw scores and chronological ages were computed for the core sample (children with typical development in the 30 to 72 month age range) and for each language group using Pearson product-moment correlation coefficients (*r*). Table 10 presents the

means, standard deviations, and correlation coefficients by domain and subscale for both languages and the core sample. These results indicate strong correlations (.73 to .90) between chronological age and the raw scores for all of the domains and subscales. This suggests that raw scores on the *LAP-D* are reliably associated with chronological age, so that older children are likely to obtain higher scores than younger children. It should be noted that the number of items in each subscale varies; therefore, the means and ranges will vary accordingly.

Table 10. *LAP-D* **Raw Score, Means, Standard Deviations, and Correlations with Chronological Age for the Core Sample by Language Group (*n*=2022)**

DOMAIN • Subscale	Total Possible	English Sample				Spanish Sample				Core Sample			
		n	M	SD	*r*	*n*	M	SD	*r*	*n*	M	SD	*r*
FINE MOTOR	59	1065	38.03	12.26	.86	943	38.27	12.35	.90	2008	38.1	12.3	.88
• Manipulation	28	1069	21.36	4.82	.79	946	21.32	5.31	.85	2015	21.3	5.1	.82
• Writing	31	1068	16.69	8.14	.83	944	16.94	7.68	.86	2012	16.8	7.9	.84
COGNITIVE	57	1064	33.18	12.23	.84	939	29.41	10.31	.86	2003	31.4	11.5	.83
• Matching	24	1067	15.92	5.42	.81	942	15.29	5.62	.86	2009	15.6	5.5	.83
• Counting	33	1068	17.23	7.48	.78	943	14.09	5.53	.74	2011	15.8	6.8	.73
LANGUAGE	53	1062	32.16	10.95	.79	938	27.50	10.41	.80	2000	30.0	10.9	.77
• Naming	30	1065	15.61	6.62	.75	939	13.01	6.07	.76	2004	14.4	6.5	.73
• Comprehension	23	1065	16.53	4.98	.74	942	14.50	4.89	.76	2007	15.6	5.0	.73
GROSS MOTOR	57	1059	39.99	10.80	.87	936	40.39	11.14	.88	1995	40.2	11.0	.87
• Body Mvt	34	1064	22.80	7.41	.85	936	23.08	7.47	.86	2000	22.9	7.4	.85
• Object Mvt	23	1064	17.19	4.07	.76	938	17.31	4.34	.77	2002	17.2	4.2	.85

Note: For all correlations, p <.01

Table 11 presents the means and standard deviations for domains and subscales by age category for each language and for the core sample. Since the raw scores for English-speaking children scored were higher than Spanish-speaking children in several areas, analyses were conducted separately for each language, and separate normative tables are provided for each language.

Table 11. Mean Raw Scores and Standard Deviations for the Core Sample by Age Category and Language Group (*n*=2022)

DOMAIN/Subscales*Age Category	English Sample			Spanish Sample			Core Sample		
FINE MOTOR	*n*	M	SD	*n*	M	SD	*n*	M	SD
30-35 months	98	19.37	5.37	78	15.69	5.23	176	17.72	5.60
36-41 months	121	24.73	6.12	89	23.59	5.45	210	24.25	5.86
42-47 months	177	31.84	6.01	120	30.73	5.09	297	31.39	5.67
48-53 months	173	36.90	6.75	191	36.26	6.11	364	36.57	6.43
54-59 months	207	42.99	7.53	178	42.92	6.30	385	42.96	6.98
60-65 months	167	48.98	6.37	189	48.83	5.05	356	48.90	5.70
66-72 months	122	53.43	5.27	98	53.92	5.27	220	53.65	4.73
• Manipulation									
30-35 months	99	12.79	4.25	78	9.76	3.55	177	11.45	4.22
36-41 months	121	16.51	4.08	90	15.38	3.77	211	16.03	3.98
42-47 months	178	19.99	2.46	121	19.12	2.22	299	19.64	2.40
48-53 months	173	21.71	2.53	192	21.34	2.63	365	21.52	2.59
54-59 months	207	23.49	2.16	178	23.90	2.33	385	23.68	2.50

60-65 months	167	24.93	2.25	190	25.05	1.89	357	24.99	2.07
66-72 months	124	26.03	1.72	98	26.03	1.72	222	26.30	1.53
• **Writing**									
30-35 months	98	6.49	2.19	78	5.96	2.64	176	6.24	2.41
36-41 months	121	8.22	2.91	89	8.20	2.91	210	8.21	2.91
42-47 months	177	11.83	4.39	120	11.59	3.80	297	11.73	4.16
48-53 months	174	15.20	5.07	191	14.91	4.40	365	15.05	4.72
54-59 months	208	19.55	5.76	178	19.02	4.79	386	19.30	5.33
60-65 months	167	24.05	4.89	189	23.78	4.03	356	23.90	4.45
66-72 months	123	27.41	4.19	98	27.41	4.19	221	27.36	3.91
COGNITIVE									
30-35 months	96	14.60	4.59	74	11.23	5.53	170	13.13	5.28
36-41 months	120	20.99	6.22	89	17.77	5.53	209	19.62	6.13
42-47 months	177	27.15	6.85	121	22.77	4.74	298	25.37	6.45
48-53 months	171	31.56	6.93	190	28.15	5.19	361	29.76	6.30
54-59 months	208	37.91	7.35	178	32.70	4.43	386	35.51	6.69
60-65 months	166	42.87	7.54	189	37.63	5.05	355	40.08	6.85
66-72 months	126	49.02	6.77	98	42.54	6.98	224	46.19	7.57
• **Matching**									
30-35 months	98	7.58	3.18	76	6.21	3.12	174	6.98	3.22
36-41 months	120	10.08	3.71	88	8.49	3.51	208	9.41	3.70
42-47 months	177	13.74	4.37	121	11.31	3.31	298	12.75	4.14
48-53 months	172	16.16	4.39	191	13.63	3.14	363	14.83	3.99
54-59 months	208	19.67	5.36	178	15.21	3.07	386	17.61	4.97
60-65 months	166	22.34	5.67	189	17.29	4.01	355	19.65	4.47
66-72 months	126	27.15	5.34	98	21.38	5.82	224	24.63	6.24
• **Counting**									
30-35 months	96	7.06	2.65	76	4.93	3.13	172	6.12	3.05
36-41 months	121	10.88	3.30	89	9.28	3.22	210	10.21	3.36
42-47 months	178	13.39	3.44	121	11.46	2.80	299	12.61	3.33
48-53 months	172	15.39	3.73	191	14.52	3.23	363	14.93	3.50
54-59 months	208	18.24	3.07	178	17.49	2.95	386	17.90	3.04
60-65 months	167	20.53	2.72	190	20.36	2.16	357	20.44	2.44
66-72 months	126	21.87	2.48	98	21.16	1.95	224	21.56	2.28
LANGUAGE									
30-35 months	98	15.68	6.29	77	11.18	5.47	175	13.70	6.33
36-41 months	119	22.65	6.09	89	17.81	5.50	208	20.59	6.31
42-47 months	175	27.22	6.89	121	22.23	5.15	296	25.18	6.69
48-53 months	172	30.69	7.05	190	24.83	6.26	362	27.62	7.25
54-59 months	207	36.22	7.48	176	29.27	6.24	383	33.02	7.75
60-65 months	167	40.59	7.12	188	36.23	6.83	355	38.28	7.29
66-72 months	126	45.21	5.72	98	40.77	7.06	224	43.25	6.71
• **Naming**									
30-35 months	98	7.48	3.50	77	4.83	3.09	175	6.31	3.57
36-41 months	120	9.75	3.01	89	7.54	2.91	209	8.82	3.15
42-47 months	176	12.36	3.60	121	9.78	2.79	297	11.31	3.52
48-53 months	172	14.37	4.23	191	11.45	3.60	363	12.83	4.17
54-59 months	207	17.68	5.33	176	13.57	4.09	383	15.79	5.22
60-65 months	167	20.59	5.24	188	17.85	4.67	355	19.14	5.13
66-72 months	124	23.82	4.40	98	21.05	5.00	222	22.60	4.86

• **Comprehension**									
30-35 months	99	8.17	3.56	77	6.35	2.94	176	7.37	3.42
36-41 months	119	12.91	3.55	88	10.28	3.16	207	11.78	3.62
42-47 months	176	14.82	3.90	121	12.45	3.02	297	13.86	3.75
48-53 months	172	16.33	3.53	190	13.38	3.14	362	14.78	3.70
54-59 months	208	18.50	3.14	178	15.70	3.33	386	17.21	4.97
60-65 months	167	19.99	2.99	189	18.40	3.18	356	19.15	3.19
66-72 months	124	21.43	2.05	98	19.73	2.77	222	20.68	2.53
GROSS MOTOR									
30-35 months	98	21.67	4.99	78	21.10	5.05	176	21.42	5.01
36-41 months	120	27.86	6.70	89	25.23	5.91	209	26.74	6.49
42-47 months	175	33.79	6.21	119	32.26	6.60	294	33.17	6.40
48-53 months	172	41.43	4.62	189	40.58	5.10	361	40.99	4.89
54-59 months	204	45.10	4.77	177	45.37	4.23	381	45.22	4.52
60-65 months	166	49.26	4.37	186	49.69	4.54	352	49.49	4.45
66-72 months	125	52.18	3.82	98	52.40	4.58	223	52.28	4.16
• **Body Movement**									
30-35 months	98	10.75	3.31	78	10.53	2.96	176	10.65	3.15
36-41 months	120	14.36	4.82	89	12.81	3.71	209	13.70	4.44
42-47 months	176	18.43	4.83	119	17.87	4.85	295	18.2 0	4.84
48-53 months	173	23.83	3.23	189	23.16	3.70	362	23.48	3.49
54-59 months	206	26.27	3.18	177	26.45	2.99	383	26.35	3.09
60-65 months	166	29.07	3.34	186	29.18	3.41	352	29.13	3.37
66-72 months	124	31.03	2.75	98	30.87	3.75	222	30.96	3.22
• **Object Movement**									
30-35 months	99	10.89	2.80	78	10.58	3.09	177	10.75	2.92
36-41 months	120	13.50	3.34	89	12.42	3.36	209	13.04	3.38
42-47 months	176	15.31	3.30	119	14.40	3.58	295	14.94	3.44
48-53 months	172	17.58	2.36	190	17.36	2.59	362	17.47	2.48
54-59 months	205	18.82	2.47	177	18.92	2.56	382	18.87	2.51
60-65 months	166	20.17	2.17	187	20.49	2.13	353	20.34	2.15
66-72 months	125	21.18	1.87	98	21.53	1.93	223	21.34	1.91

Internal Consistency

The internal consistency of the *LAP-D* was examined to determine how well the items within each subscale and domain relate to one another. The internal consistency coefficient indicates how effectively the individual domain scores on the *LAP-D* are measuring defined constructs (e.g., gross motor, fine motor, cognitive skills). The higher the value, the greater was the consistency of items within the domain. Cronbach's coefficient alpha was used to calculate the internal consistency of each domain by age and language group (*n*=1075 for English-speaking children, *n*=947 for Spanish-speaking children). All items before the basal were counted as correct and all items above the ceiling were counted as incorrect for calculating the internal consistency coefficients.

Table 12a presents the results of the internal consistency analyses for the English-speaking sample. The alpha coefficients for the total English-speaking sample indicate very strong internal consistency for each subscale and domain (.89 to .97). The alpha coefficients for the individual

age groups are also quite high (.69 to .92). These results indicate that the *LAP-D* items show strong internal consistency for English-speaking children within each domain across the various age groups covered by this measure.

Table 12a. Internal Consistency of *LAP-D* Raw Scores by Age Group for English-Speaking Sample (*n*=1075)

DOMAINS	30-35[a] months	36-41[b] months	42-47[c] months	48-53[d] months	54-59[e] months	60-65[f] months	66-72[g] months	Total[h]
Fine Motor	.87	.90	.88	.85	.85	.83	.83	.96
• Manipulation	.87	.88	.77	.75	.79	.75	.69	.91
• Writing	.75	.82	.89	.91	.92	.90	.89	.96
Cognitive	.87	.90	.90	.91	.92	.91	.89	.97
• Matching	.81	.85	.89	.90	.91	.92	.92	.95
• Counting	.75	.85	.84	.86	.82	.80	.80	.93
Language	.82	.90	.91	.91	.92	.92	.91	.97
• Naming	.85	.82	.86	.87	.91	.91	.88	.94
• Comprehension	.86	.87	.88	.85	.83	.86	.76	.92
Gross Motor	.91	.91	.92	.92	.92	.90	.90	.96
• Body Mvt.	.86	.89	.89	.84	.81	.83	.81	.95
• Object Mvt.	.80	.84	.84	.75	.78	.73	.71	.89

Note: For all correlations, p <.01
n: a (FM=98, FM_M=99, FM_W=98, C=96, C_M=96, C_C=98, L=98, L_C=99, L_n=98, GM=98, GM_B=98, GM_O=99)
  b (FM=121, FM_M=121, FM_W=121, C=120, C_M=121, C_C=120, L=119, L_C=120, L_n=120, GM=120, GM_B=120, GM_O=120)
  c (FM=178, FM_M=177, FM_W=178, C=177, C_M=178, C_C=177, L=175, L_C=176, L_n=176, GM=175, GM_B=176, GM_O=176)
  d (FM=173, FM_M=173, FM_W=174, C=171, C_M=172, C_C=172, L=172, L_C=172, L_n=172, GM=172, GM_B=173, GM_O=172)
  e (FM=207, FM_M=207, FM_W=208, C=208, C_M=208, C_C=208, L=208, L_C=208, L_n=207, GM=204, GM_B=206, GM_O=205)
  f (FM=167, FM_M=167, FM_W=167, C=166, C_M=167, C_C=166, L=167, L_C=167, L_n=167, GM=166, GM_B=166, GM_O=167)
  g (FM=122, FM_M=124, FM_W=123, C=126, C_M=126, C_C=126, L=124, L_C=124, L_n=125, GM=124, GM_B=125, GM_O=125)
  h (FM=1065, FM_M=1069, FM_W=1068, C=1064, C_M=1068, C_C=1067, L=1062, L_C=1065, L_n=1065, GM=1059, GM_B=1064, GM_O=1064)

Table 12b presents the results of the internal consistency analyses for the Spanish-speaking sample. The alpha coefficients for the total Spanish-speaking sample indicate very strong internal consistency for each subscale and domain (.90 to .97). The alpha coefficients for the individual age groups are generally quite high also (.70 to .93), These results indicate that the *LAP-D* items generally show strong internal consistency for Spanish-speaking children within each domain across the various age groups covered by this measure, except for the Fine Motor: Manipulation subscale for 66-72-month-old Spanish-speaking children, which was lower (*r* = .47).

Table 12b. Internal Consistency of *LAP-D* Raw Scores by Age Group for Spanish-Speaking Sample (*n*=947)

DOMAINS	30-35[a] months	36-41[b] months	42-47[c] months	48-53[d] months	54-59[e] months	60-65[f] months	66-72[g] months	Total[h]
Fine Motor	.88	.88	.87	.89	.90	.86	.83	.97
• Manipulation	.85	.86	.74	.77	.75	.66	.47	.93
• Writing	.81	.82	.87	.89	.90	.87	.86	.95
Cognitive	.88	.88	.85	.87	.83	.87	.92	.96
• Matching	.82	.84	.85	.86	.86	.89	.93	.93
• Counting	.82	.85	.81	.82	.80	.71	.70	.93
Language	.89	.90	.89	.91	.90	.92	.93	.96
• Naming	.83	.82	.83	.87	.89	.90	.92	.94
• Comprehension	.83	.86	.84	.85	.85	.87	.87	.92
Gross Motor	.87	.88	.89	.86	.81	.85	.88	.96
• Body Mvt.	.83	.86	.89	.85	.79	.84	.89	.95
• Object Mvt.	.84	.84	.86	.78	.77	.73	.76	.90

Note: For all correlations, p <.01

n: a (FM=78, FM_M=78, FM_W=78, C=74, C_M=76, C_C=76, L=77, L_C=77, L_n=77, GM=78, GM_B=78, GM_O=78)
b (FM=89, FM_M=89, FM_W=90, C=89, C_M=89, C_C=89, L=88, L_C=89, L_n=88, GM=89, GM_B=89, GM_O=89)
c (FM=120, FM_M=121, FM_W=120, C=121, C_M=121, C_C=121, L=121, L_C=121, L_n=121, GM=119, GM_B=119, GM_O=119)
d (FM=191, FM_M=192, FM_W=191, C=190, C_M=191, C_C=191, L=190, L_C=190, L_n=191, GM=189, GM_B=189, GM_O=190)
e (FM=178, FM_M=178, FM_W=178, C=178, C_M=178, C_C=178, L=176, L_C=178, L_n=176, GM=177, GM_B=177, GM_O=177)
f (FM=189, FM_M=190, FM_W=189, C=189, C_M=190, C_C=189, L=188, L_C=189, L_n=188, GM=186, GM_B=186, GM_O=187)
g (FM=98, FM_M=98, FM_W=98, C=98, C_M=98, C_C=98, L=98, L_C=98, L_n=98, GM=98, GM_B=98, GM_O=98)
h (FM=943, FM_M=946, FM_W=944, C=939, C_M=943, C_C=942, L=938, L_C=942, L_n=939, GM=936, GM_B=936, GM_O=938)

Standard Errors of Measurement

The Standard Error of Measurement (SEM) provides an estimate of the amount of error between an individual's observed score and the population's true score. The SEM has an inverse relationship with reliability so that as reliability increases, the SEM decreases, indicating greater confidence in the accuracy of the observed scores. SEM's were calculated for each subscale and domain for each language group (*n*=1075 for English-speaking children, *n*=947 for Spanish-speaking children) by the following formula, $SEM = s\sqrt{1-r}$, where SEM 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 SEM.

Table 13a presents the SEMs for each domain of the *LAP-D* by age category for English-speaking children. The results of each of these calculations produced fairly small SEMs, indicating a high degree of confidence that the observed scores on the *LAP-D* will provide an accurate representation of an individual's skills. That is, due to the properties of SEMs, the smaller the SEM, the lower the distance between the observed and true scores. Thus, the user can have greater confidence in the fact that the observed score is representative of the true score.

Table 13a. Standard Errors of Measurement of *LAP-D* Raw Scores by Age Category for English-Speaking Sample (*n*=1075)

DOMAIN/ Subscale	30-35[a] months	36-41[b] months	42-47[c] months	48-53[d] months	54-59[e] months	60-65[f] months	66-72g[f] months	Total[h]
FINE MOTOR	1.94	1.94	2.08	2.61	2.92	2.63	2.17	2.45
• Manipulation	1.53	1.41	1.18	1.27	0.99	1.13	0.96	1.45
• Writing	1.10	1.23	1.46	1.52	1.63	1.55	1.39	1.63
COGNITIVE	1.65	1.97	2.17	2.08	2.08	2.26	2.25	2.12
• Matching	1.16	1.28	1.14	1.18	0.92	0.77	0.70	1.21
• Counting	1.59	1.44	1.75	1.64	2.27	2.54	2.39	1.98
LANGUAGE	2.67	1.93	2.07	2.12	2.12	2.01	1.72	1.90
• Naming	1.36	1.28	1.35	1.53	1.60	1.57	1.52	1.62
• Comprehension	1.33	1.28	1.35	1.37	1.29	1.12	1.00	1.41
GROSS MOTOR	1.50	2.01	1.76	1.31	1.35	1.38	1.21	2.16
• Body Movement	1.24	1.60	1.60	1.29	1.39	1.38	1.20	1.66
• Object Movement	1.25	1.34	1.32	1.18	1.16	1.13	1.01	1.35

Note: For all correlations, p <.01

n: a (FM=98, FM_M=99, FM_W=98, C=96, C_M=96, C_C=98, L=98, L_C=99, L_n=98, GM=98, GM_B=98, GM_O=99)

   b (FM=121, FM_M=121, FM_W=121, C=120, C_M=121, C_C=120, L=119, L_C=119, L_n=120, GM=120, GM_B=120, GM_O=120)

   c (FM=178, FM_M=177, FM_W=178, C=177, C_M=178, C_C=177, L=175, L_C=176, L_n=176, GM=175, GM_B=176, GM_O=176)

   d (FM=173, FM_M=173, FM_W=174, C=171, C_M=172, C_C=172, L=172, L_C=172, L_n=172, GM=172, GM_B=173, GM_O=172)

   e (FM=207, FM_M=207, FM_W=208, C=208, C_M=208, C_C=208, L=208, L_n=207, GM=204, GM_B=206, GM_O=205)

   f (FM=167, FM_M=167, FM_W=167, C=166, C_M=167, C_C=166, L=167, L_C=167, L_n=167, GM=166, GM_B=166, GM_O=167)

   g (FM=122, FM_M=124, FM_W=123, C=126, C_M=126, C_C=126, L=124, L_C=124, L_n=125, GM=124, GM_B=125, GM_O=125)

   h (FM=1065, FM_M=1069, FM_W=1068, C=1064, C_M=1068, C_C=1067, L=1062, L_C=1065, L_n=1065, GM=1059, GM_B=1064, GM_O=1064)

Table 13b presents the SEMs for each domain of the *LAP-D* by age category for Spanish-speaking children. The results of each of these calculations also produced fairly small SEMs, indicating a high degree of confidence that the observed scores on the *LAP-D* will provide an accurate representation of an individual's skills.

SEM's can be used to determine confidence intervals indicating the range within which a child's true score is likely to fall, based on the child's observed score and the SEM. For example, we can be 95% confident that the child's true score will be within the range of scores indicated by the 95% confidence interval. Confidence intervals can be determined at different levels, based on standard formulas, with larger ranges for wider confidence intervals. The formula for calculating the 95% confidence interval is *observed score ± 1.96 x SEM*, while the formula for the 99% confidence interval is *observed score ± 2.58 x SEM.*

Table 13b. Standard Errors of Measurement of *LAP-D* Raw Scores by Age Category for Spanish-Speaking Sample (*n*=947)

DOMAIN/ Subscale	30-35[a] months	36-41[b] months	42-47[c] months	48-53[d] months	54-59[e] months	60-65[f] months	66-72g[f] months	Total[h]
FINE MOTOR	1.81	1.89	1.84	2.03	1.99	1.89	2.17	2.14
• Manipulation	1.37	1.41	1.13	1.26	1.17	1.10	1.25	1.40
• Writing	1.15	1.23	1.37	1.46	1.51	1.45	1.57	1.72
COGNITIVE	1.92	1.92	1.84	1.87	1.83	1.82	1.97	2.06
• Matching	1.33	1.29	1.08	1.21	1.10	0.72	0.52	1.49
• Counting	1.32	1.36	1.44	1.33	1.37	2.16	3.19	1.46
LANGUAGE	1.81	1.74	1.71	1.88	1.97	1.93	1.87	2.08
• Naming	1.27	1.23	1.15	1.30	1.36	1.48	1.41	1.49
• Comprehension	1.21	1.18	1.21	1.22	1.29	1.15	1.00	1.38
GROSS MOTOR	1.82	2.05	2.19	1.91	1.84	1.76	1.59	2.23
• Body Movement	1.22	1.39	1.61	1.43	1.37	1.36	1.24	1.67
• Object Movement	1.24	1.34	1.34	1.21	1.23	1.11	0.95	1.37

Note: For all correlations, p <.01

n: a (FM=78, FM_M=78, FM_W=78, C=74, C_M=76, C_C=76, L=77, L_C=77, L_n=77, GM=78, GM_B=78, GM_O=78)
  b (FM=89, FM_M=89, FM_W=90, C=89, C_M=89, C_C=89, L=88, L_C=89, L_n=88, GM=89, GM_B=89, GM_O=89)
  c (FM=120, FM_M=121, FM_W=120, C=121, C_M=121, C_C=121, L=121, L_C=121, L_n=121, GM=119, GM_B=119, GM_O=119)
  d (FM=191, FM_M=192, FM_W=191, C=190, C_M=191, C_C=191, L=190, L_C=190, L_n=191, GM=189, GM_B=189, GM_O=190)
  e (FM=178, FM_M=178, FM_W=178, C=178, C_M=178, C_C=178, L=176, L_C=178, L_n=176, GM=177, GM_B=177, GM_O=177)
  f (FM=189, FM_M=190, FM_W=189, C=189, C_M=190, C_C=189, L=188, L_C=189, L_n=188, GM=186, GM_B=186, GM_O=187)
  g (FM=98, FM_M=98, FM_W=98, C=98, C_M=98, C_C=98, L=98, L_C=98, L_n=98, GM=98, GM_B=98, GM_O=98)
  h (FM=943, FM_M=946, FM_W=944, C=939, C_M=943, C_C=942, L=938, L_C=942, L_n=939, GM=936, GM_B=936, GM_O=938)

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 *LAP-D* 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 *LAP-D* 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) representing both language groups. The Test-Retest Sample was composed of 318 children from 30 to 72 months of age (M = 53.89, SD = 10.93), including both typically and atypically developing children (see Table 14). The sample consisted of 163 (51%) English-speaking children and 155 (49%) Spanish-speaking children, with mean ages of 53.32 months and 54.49 months, respectively. Additionally, the sample was comprised of 49.69% females and 50.31% males and 3.14% atypically developing children. Among English-speaking children, 10.43% were Black or African-America, 25.77% Latino, 51.53% White, <1% each Asian and Native Hawaiian/Other Pacific Islander, and 1.23% Unknown Race. The Latino cultural backgrounds among Spanish-speaking children included 14.19% Central or South American, 3.87% Cuban, 23.87% Mexican, 3.87% Puerto Rican, with the remainder unknown.

Table 14. Demographics of Test-Retest Sample by Language Group (*n*=318)

Age Category	English Retest Sample		Spanish Retest Sample		Total Test-Retest Sample	
	n	*%*	*n*	*%*	*n*	*%*
30-35 mos	16	5.03	10	3.14	26	8.18
36-41 mos	13	4.09	13	4.09	26	8.18
42-47 mos	25	7.86	20	6.29	45	14.15
48-53 mos	22	6.92	23	7.23	45	14.15
54-59 mos	33	10.38	27	8.49	60	18.87
60-65 mos	29	9.12	42	13.21	71	22.33
66-72 mos	25	7.86	20	6.29	45	14.15
Total	163	51.26	155	48.74	318	100.0
Gender	*n*	*%*	*n*	*%*	*n*	*%*
Female	80	25.16	78	24.53	158	49.69
Male	83	26.10	77	24.21	160	50.31
Race/Ethnicity/Cultural Background	*n*	*%*	*n*	*%*	*n*	*%*
Black or African American	17	10.43	-	-	-	-
Asian	1	<1.00				
Latino	42	25.77	-	-	-	-
Native Hawaiian/Other Pacific Islander	1	<1.00	-	-	-	-
White	84	51.53	-	-	-	-
Unknown Race	18	11.00	-	-	-	-
Central or South American	-	-	22	14.19	-	-
Cuban	-	-	6	3.87	-	-
Mexican	-	-	37	23.87	-	-
Puerto Rican	-	-	6	3.87	-	-
Unknown Latino Background	-	-	84	54.2	-	-

Test-retest reliability was determined by calculating the correlations between subscales and the domain scores from the first and the second test administrations using Pearson's *r*. Table 15a presents the means and standard deviations for the first and second test scores and the test-retest correlation coefficients for each domain and subscale for the English-speaking sample. The resulting correlations at both the domain (.95 to .97) and subscale (.88 to .96) levels demonstrate very good test-retest reliability, indicating a high degree of stability in individual test scores over short intervals of time.

Table 15a. Means, Standard Deviations, and Correlations of *LAP-D* Raw Scores for Test-Retest Reliability English-Speaking Sample (*n*=163)

DOMAIN/Subscale	First Testing		Second Testing		
	Mean	SD	Mean	SD	*r*
FINE MOTOR	38.22	12.35	40.47	11.91	.97
• Manipulation	21.42	4.85	22.56	4.29	.91
• Writing	16.82	8.18	17.92	8.31	.96
COGNITIVE	33.23	12.25	35.51	12.52	.96
• Matching	16.00	5.46	17.46	5.43	.92
• Counting	17.19	7.49	18.05	7.72	.95
LANGUAGE	32.19	11.00	34.71	11.89	.96
• Naming	15.65	6.63	17.35	7.49	.93
• Comprehension	16.52	5.01	17.39	4.96	.94
GROSS MOTOR	40.13	10.84	41.45	10.13	.95
• Body Movement	22.91	7.45	23.58	7.12	.94
• Object Movement	17.20	4.07	17.90	3.69	.88

Note: For all correlations, p <.01

n: FM=158, FM$_M$=159, FM$_W$=159, C=159, C$_M$=159, C$_C$=159, L=159, L$_C$=160, L$_N$=159, G$_M$=159, GM$_B$=159, GM$_O$=160

Table 15b presents the means and standard deviations for the first and second test scores and the test-retest correlation coefficients for each domain and subscale for the Spanish-speaking sample. The resulting correlations at both the domain (.93 to .95) and subscale (.86 to .94) levels demonstrate very good test-retest reliability, indicating a high degree of stability in individual test scores over short intervals of time.

Table 15b. Means, Standard Deviations, and Correlations of *LAP-D* Raw Scores for Test-Retest Reliability Spanish-Speaking Sample (*n*=155)

DOMAIN/Subscale	First Testing		Second Testing		
	Mean	SD	Mean	SD	*R*
FINE MOTOR	38.10	12.33	41.27	12.21	.95
• Manipulation	21.29	5.27	22.78	4.69	.93
• Writing	16.90	7.07	18.53	8.07	.93
COGNITIVE	29.36	10.34	31.96	10.01	.94
• Matching	15.30	5.57	16.87	5.62	.93
• Counting	14.06	5.57	15.08	5.19	.90
LANGUAGE	37.57	10.36	30.39	10.26	.93
• Naming	13.01	6.05	14.69	6.25	.89
• Comprehension	14.51	4.85	15.69	4.51	.91
GROSS MOTOR	40.30	11.11	43.25	10.36	.95
• Body Movement	23.01	7.47	24.89	6.87	.94
• Object Movement	17.29	4.32	18.36	4.18	.86

Note: For all correlations, p <.01

n: FM=155, FM_M=155, FM_W=155, C=155, C_M=155, C_C=155, L=155, L_C=155, L_N=155, G_M=155, GM_B=155, GM_O=155

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. In order to determine interrater reliability, the *LAP-D* 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 (called the Interrater Reliability Sample). The Interrater Reliability Sample was comprised of 147 children from 30 to 71 months of age (M = 52.25, SD = 10.41), including both typically and atypically developing children (see Table 19). The sample consisted of 58 (39.46%) English-speaking children and 89 (60.54%) Spanish-speaking children, with mean ages of 50.93 months and 53.09 months, respectively. Additionally, the sample was comprised of 55.10% females, 44.90% males, and 2.04% atypically developing children. Among English-

speaking children, 8.62% were Black or African-America, 31.03% Latino, 51.72% White, <2% each American Indian/Alaskan Native and Native Hawaiian/Other Pacific Islander, and 5.17% "other." The Latino cultural backgrounds among Spanish-speaking children included 2.25% Central or South American, 2.25% Cuban, 31.46% Mexican, with the remainder being unknown or unreported.

Table 16. Distribution of Interrater Reliability Sample by Language Group and Age Category (*n*=147)

Age Category	English Interrater Sample		Spanish Interrater Sample		Total Interrater Sample	
	Number of Children	Percentage of Sample	Number of Children	Percentage of Sample	Number of Children	Percentage of Sample
30-35 mos	6	4.08%	3	2.04%	9	6.12%
36-41 mos	9	6.12%	8	5.44%	17	11.56%
42-47 mos	7	4.76%	14	9.52%	21	14.29%
48-53 mos	11	7.48%	16	10.88%	27	18.37%
54-59 mos	11	7.48%	22	14.97%	33	22.45%
60-65 mos	5	3.40%	17	11.56%	22	14.97%
66-72 mos	9	6.12%	9	6.12%	18	12.24%
Total	58	39.46%	89	60.54%	147	100%
Gender						
Female	31	21.09	50	34.01	81	55.1
Male	27	18.37	39	33.33	66	44.9
Race/Ethnicity/Cultural Background						
Black or African American	5	8.6	-	-	-	-
Asian	1	<2	-	-	-	-
Latino	18	31.03	-	-	-	-
Native Hawaiian/Other Pacific Islander	1	<2	-	-	-	-
White	30	51.7	-	-	-	-
Unknown Race	3	5.2	-	-	-	-
Central or South American	-	-	2	2.3	-	-
Cuban	-	-	2	2.3	-	-
Mexican	-	-	28	31.5	-	-
Unknown Latino Background	-	-	57	64.0	-	-

Interrater reliability was determined by computing the correlations between the subscale and domain scores from the two test administrations by different examiners using Pearson's *r*. Table 17a presents the means and standard deviations for both test administrations and the interrater reliability correlation coefficients for each domain and subscale for the English-speaking sample. The resulting correlations at both the domain (.90 to .93) and subscale (.82 to .93) levels indicate a high degree of reliability when the *LAP-D* is administered by two different examiners.

Table 17a. Means, Standard Deviations, and Correlations of *LAP-D* Raw Scores for Interrater Reliability English-Speaking Sample (*n*=58)

DOMAIN/Subscale	First Testing		Second Testing		
	Mean	SD	Mean	SD	*R*
FINE MOTOR	38.22	12.35	38.07	11.75	.93
• Manipulation	21.42	4.85	21.22	5.12	.82
• Writing	16.82	8.18	16.64	7.67	.93
COGNITIVE	33.23	12.25	33.15	11.62	.93
• Matching	16.00	5.46	16.81	5.10	.89
• Counting	17.20	7.49	16.34	7.03	.87
LANGUAGE	32.19	11.00	33.42	10.88	.91
• Naming	15.65	6.63	16.21	5.95	.86
• Comprehension	16.51	5.01	17.21	4.90	.89
GROSS MOTOR	40.13	10.84	39.14	10.29	.90
• Body Movement	22.92	7.45	22.30	7.50	.88
• Object Movement	17.20	4.08	17.00	3.65	.78

Note: For all correlations, p <.01

n: FM=55, FM_M=56, FM_W=55, C=53, C_M=53, C_C=53, L=53, L_C=53, L_N =*53*, GM=52, GM_B=53, GM_O=52

Table 17b presents the means and standard deviations for both test administrations and the interrater reliability correlation coefficients for each domain and subscale for the Spanish-speaking sample. The resulting correlations at both the domain (.86 to .94) and subscale (.72 to .92) levels indicate a high degree of reliability when the *LAP-D* is administered by two different examiners.

Table 17b. Means, Standard Deviations, and Correlations of *LAP-D* Raw Scores for Interrater Reliability Spanish-Speaking Sample (*n*=89)

DOMAIN/Subscale	First Testing		Second Testing		
	Mean	SD	Mean	SD	*R*
FINE MOTOR	38.10	12.33	39.01	11.39	.94
• Manipulation	21.29	5.27	22.21.	4.35	.90
• Writing	16.90	7.75	17.01	7.78	.92
COGNITIVE	29.36	10.34	30.75	9.26	.88
• Matching	15.30	5.57	16.49	5.00	.86
• Counting	14.06	5.57	14.25	5.21	.81
LANGUAGE	17.51	10.36	28.38	9.58	.86
• Naming	13.01	6.05	13.36	5.93	.82
• Comprehension	14.51	4.85	15.02	4.37	.79
GROSS MOTOR	46.30	11.11	41.64	10.54	.86
• Body Movement	23.01	7.47	.23.92	6.85	.81
• Object Movement	17.29	4.32	17.72	4.38	.72

Note: For all correlations, p <.01

n: FM=86, FM$_M$=87, FM$_W$=86, C=87, C$_M$=87, C$_C$=87, L=87, L$_C$=87, L$_{N=}$87, G$_M$=88, GM$_B$=88, GM$_O$=88

Validity

The foremost authoritative reference on validity and other test matters, the *Standards for Educational and Psychological Testing* (1999), 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 *Standards for Educational and Psychological Testing* (1999) as demonstrating the validity of test score inferences: (1) construct-related evidence; (2) content-related evidence; (3) predictive evidence; and (4) concurrent evidence. Two of these types of validity analyses are presented below: construct validity and criterion validity.

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 subscales and domains measure different skills, the intercorrelations 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 or subscales 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 raw scores for each domain for the core sample (*n*=2022), as shown below the diagonal in Tables 18a and 19a for each language group, and for each subscale for the core sample, as shown below the diagonal in Tables 18b and 19b.

As seen in Table 18a, the generally high positive correlations at both the domain and subscale levels for the English-speaking sample potentially indicate a single underlying construct. However, 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 subscale and domain raw scores, as depicted above the diagonal in Tables 18a and 18b. The magnitudes of the partial correlation coefficients are substantially smaller than the zero-order correlations, in the modest to moderate range for all but a few of subscales which are highly conceptually related. These results suggest that, while the different subscales and domains of the *LAP-D* are somewhat related, they are also measuring somewhat independent aspects of development.

Table 18a. Zero-order Correlations (below diagonal) and Partial Correlations (above diagonal) Controlling for Age Among *LAP-D* Domains for English-Speaking Children in the Core Sample (*n*=1075)

	FINE MOTOR	COGNITIVE	LANGUAGE	GROSS MOTOR
FINE MOTOR		.58	.47	.35
COGNITIVE	.83		.66	.28
LANGUAGE	.83	.88		.27
GROSS MOTOR	.84	.81	.77	

Note: For all correlations, p <.01, zero-order correlations are depicted below the diagonal.

n: FM=1065, FM_M=1069, FM_W=1068, C=1064, C_M=1068, C_C=1067, L=1062, L_C=1065, L_n=1065, GM_M=1059, GM_B=1064, GM_O=1065

Table 18b. Zero-order Correlations (below diagonal) and Partial Correlations (above diagonal) Controlling for Age Among *LAP-D* Subscales for English-Speaking Children in the Core Sample (*n*=1075)

	FM$_M$	FM$_W$	COG$_M$	COG$_C$	LNG$_N$	LNG$_C$	GM$_B$	GM$_O$
FM$_M$		.37	.49	.33	.30	.40	.32	.26
FM$_W$	.79		.44	.41	.39	.29	.26	.11
CG$_M$	.82	.82		.44	.39	.43	.27	.16
CG$_C$	.74	.79	.79		.55	.55	.20	.13
LN$_N$	.72	.77	.76	.81		.79	.19	.10
LN$_C$	.75	.72	.77	.81	.52		.27	.22
GM$_B$	.78	.78	.78	.73	.71	.72		.29
GM$_O$	.71	.67	.68	.65	.62	.66	.75	

Note: For all correlations, p <.01, zero-order correlations are depicted below the diagonal.

n: FM=1065, FM$_M$=1069, FM$_W$=1068, C=1064, C$_M$=1068, C$_C$=1067, L=1062,L$_C$=1065, L$_{n}$=1065,G$_M$=1059,GM$_B$=1064,GM$_O$=1065

Tables 19a and 19b present the zero-order (below diagonal) and partial-order (above diagonal) correlations between subscales and domains for the core sample of Spanish-speaking children (*n*=947). As above, the zero-order correlations were very high. However, when controlling for chronological age, the correlations reflect related, but more distinct, areas of development.

Table 19a. Zero-order Correlations (below diagonal) and Partial Correlations (above diagonal) Controlling for Age Among *LAP-D* Domains for Spanish-Speaking Children in the Core Sample (*n*=947)

	FINE MOTOR	COGNITIVE	LANGUAGE	GROSS MOTOR
FINE MOTOR		.52	.44	.34
COGNITIVE	.89		.52	.34
LANGUAGE	.84	.85		.23
GROSS MOTOR	.86	.84	.77	

Note: For all correlations, p <.01

n: FM=1065, FM$_M$=1069, FM$_W$=1068, C=1064, C$_M$=1068, C$_C$=1067, L=1062,L$_C$=1065, L$_{n}$=1065,G$_M$=1059,GM$_B$=1064,GM$_O$=1065

Table 19b. Zero-order Correlations (below diagonal) and Partial Correlations (above diagonal) Controlling for Age Among *LAP-D* Subscales for Spanish-Speaking Children in the Core Sample (*n*=947)

	FM_M	FM_W	COG_M	COG_C	LNG_N	LNG_C	GM_B	GM_O
FM_M		.26	.42	.19	.20	.31	.29	.22
FM_W	.80		.39	.33	.34	.36	.24	.13
CG_M	.85	.84		.23	.28	.33	.35	.34
CG_C	.70	.75	.71		.40	.41	.19	.09
LN_N	.71	.76	.75	.73		.80	.23	.04
LN_C	.75	.77	.77	.74	.52		.24	.08
GM_B	.81	.80	.83	.70	.73	.73		.31
GM_O	.74	.70	.75	.61	.60	.63	.77	

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

n: FM=1065, FM_M=1069, FM_W=1068, C=1064, C_M=1068, C_C=1067, L=1062, L_C=1065, L_n=1065, G_M=1059, GM_B=1064, GM_O=1065

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 *LAP-D* and the *Dial-3* or the *WJ-R* was examined to investigate the criterion validity of a sub-sample of the English-speaking children in the Project Sample. The Spanish edition of the *Dial-3* and the *Batería-R* were used to investigate the criterion validity for a sub-sample of the Spanish-speaking children in the Project Sample. Additionally, most English-speaking children were administered the *PPVT-III* and most Spanish-speaking children the *TVIP*, also for criterion validity purposes.

Of the Core Sample, 197 children (9.7%) were administered both the *LAP-D* and the *Dial-3*, either 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 *LAP-D* domain raw scores and the *Dial-3* subscale raw scores for conceptually related areas. Table 20 presents these correlations. The results indicate moderate to very strong correlations (.50 to .92) between the *LAP-D* and *Dial-3* scores in each domain. In general, these correlations tend to be stronger in the English-speaking sample, but it is not possible to determine which of the measures, the *LAP-D* or the criterion measure, is contributing to the lower correlations for the Spanish-speaking sample.

Table 20. Correlations Between *LAP-D* and *Dial-3* for the Core Sample by Language (*n*=197).

LAP-D Subscales/Domains	English Sample[1]			Spanish Sample[2]		
	Dial-3 Motor	Dial-3 Concepts	Dial-3 Language	Dial-3 Motor	Dial-3 Concepts	Dial-3 Language
FINE MOTOR	.92	.85	.85	.83	.74	.71
• Manipulation	.80	.83	.79	.79	.71	.62
• Writing	.92	.80	.83	.79	.71	.73
COGNITIVE	.86	.90	.89	.81	.78	.75
• Matching	.86	.87	.86	.74	.67	.63
• Counting	.79	.84	.85	.75	.76	.78
LANGUAGE	.85	.86	.87	.68	.77	.81
• Naming	.78	.79	.80	.65	.75	.80
• Comprehension	.81	.84	.84	.63	.71	.71
GROSS MOTOR	.87	.82	.80	.73	.62	.53
• Body Mvt.	.87	.78	.80	.69	.59	.50
• Object Mvt.	.75	.74	.68	.62	.51	.51

Note: [1]*n*=85 , [2]*n*=112

In addition to the *Dial-3* subsample, 409 children (19.5%) were administered both the *LAP-D* and the *WJ-R* or *Batería-R*, either 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 *LAP-D* domain raw scores and the raw scores on the *WJ-R* or *Batería-R* for conceptually related areas. Table 21 presents these correlations. The results indicate fairly strong correlations (.50 to .79) between the *LAP-D* and *WJ-R/Batería-R* scores in each domain.

Table 21. Correlations Between *LAP-D* and *WJ-R/Batería-R* for the Core Sample by Language (*n*=409).

LAP-D Subscales/Domains	English Sample[1]			Spanish Sample[2]		
	WJ-R DICT	WJ-R AP	WJ-R LWI	Batería-R DICT	Batería-R AP	Batería-R LWI
FINE MOTOR	.78	.70	.65	.78	.60	.50
• Manipulation	.67	.65	.55	.70	.59	.45
• Writing	.79	.67	.65	.77	.56	.50
COGNITIVE	.75	.75	.72	.79	.64	.57
• Matching	.64	.64	.58	.76	.62	.50
• Counting	.75	.76	.74	.72	.57	.57
LANGUAGE	.70	.76	.67	.66	.56	.50
• Naming	.66	.69	.61	.64	.51	.48
• Comprehension	.65	.75	.65	.62	.58	.47
GROSS MOTOR	.69	.67	.56	.72	.56	.46
• Body Mvt.	.64	.64	.53	.69	.56	.44
• Object Mvt.	.61	.59	.48	.69	.49	.45

Note:: [1]*n*=231, [2]*n*=178

Lastly, 1960 children (93.4%) of the core sample were administered both the *LAP-D* and the *PPVT-III/TVIP*, either 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

LAP-D domain and subscale raw scores and the *PPVT-III/TVIP* raw scores. Table 22 presents these correlations. The results indicate strong correlations (.52 to .83) between the *LAP-D* and *PPVT-III/TVIP* scores in each domain. In general, these correlations tend to be stronger in the English-speaking sample, but it is not possible to determine which of the measures, the *LAP-D* or the criterion measure, is contributing to the lower correlations for the Spanish-speaking sample.

Table 22. Correlations Between *LAP-D* and *PPVT-III/TVIP* for the Core Sample by Language (*n*=1960).

LAP-D Subscales/Domains	English Sample[1] PPVT-III	Spanish Sample[2] TVIP
FINE MOTOR	.73	.59
• Manipulation	.70	.53
• Writing	.69	.58
COGNITIVE	.80	.63
• Matching	.74	.58
• Counting	.77	.59
LANGUAGE	.83	.64
• Naming	.79	.59
• Comprehension	.77	.62
GROSS MOTOR	.66	.57
• Body Mvt.	.63	.54
• Object Mvt.	.60	.52

Note: [1]*n*=984, [2]*n*=976

Children With Disabilities

Because the *LAP-D* is sometimes used to examine the skill development of children with developmental delays or diagnosed disabilities, a subsample of 77 children with disabilities (3.67%) was selected that reflected the U.S. rates for children under age 18 with disabilities (U.S. Census Bureau, 2000). These children had been professionally diagnosed and were receiving special education services. They ranged in age from 30 to 72 months of age (*M* = 51.86, SD = 10.67), and 49.82% were females and 50.18% males. For the English-speaking sample (*n* = 49), 4.08% were African American, 2.04% Asian and Pacific Islander, 26.53% Hispanic origin, 61.22% White, and 6.12% "Other" racial/ethnic origins. For the Spanish-speaking sample, *n* = 28), 3.57% were Central or South American, 28.57% Mexican, 3.57% Puerto Rican, and 64.29% "Other" Latino background.

The distribution of children across geographic areas was 24.68% from the Northeast, 27.28% from the South, 22.08% from the Central, and 25.97% from the Southwest. Of the 77 children in the sample, four children had developmental delays, four children had motor or other health disabilities, 44 children had speech and language disabilities, three children had behavioral disabilities, two children had social or emotional disabilities, and 20 children were classified as having "other state defined" disabilities. 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 adaptive equipment for child with limited mobility).

Table 23 depicts the means, standard deviations, and correlations with chronological age (using Pearson's *r*) for each domain for the Atypical Development Sample. Although the means for each subscale and domain are not significantly different from those of typically developing children, the correlations between the raw scores and chronological age are much weaker than those for typically developing children. These results provide evidence that the *LAP-D* 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 23. Domain/Subscale, Means, Standard Deviations, and Correlations of *LAP-D* for Atypical Development Sample (*n*=77)

DOMAINS • Subscale	Total Possible	Mean	SD	*r*
Fine Motor	59	39.6	10.5	.76
• **Manipulation**	28	22.1	3.8	.71
• **Writing**	31	17.5	7.2	.73
Cognitive	57	32.6	10.3	.75
• **Matching**	24	16.9	4.9	.72
• **Counting**	33	15.7	6.0	.68
Language	53	31.4	10.6	.68
• **Naming**	30	15.4	6.2	.64
• **Comprehension**	23	15.9	4.9	.66
Gross Motor	57	41.3	10.1	.75
• **Body Mvt.**	34	23.9	7.3	.65
• **Object Mvt.**	23	17.4	3.7	.74

Note: All correlations significant at, p <. 0001
n: FM=75, FM$_M$=76, FM$_W$=75, C=75, C$_M$=75, C$_C$=76, L=76,L$_C$=77, L$_n$=76,GM$_M$=75,GM$_B$=75,GM$_O$=75

Chapter 7
Process for Developing Norming Tables

The present section describes the standardization sample, normative procedures, and *LAP-D* scores. Normative tables for the *LAP-D* are presented by six-month age groupings. Characteristics of the standardization sample of 2099 children were presented in Chapter 4. All normative tables are located in the Appendix.

Table A-1 in Appendix A may be used to convert percentile ranks to normalized standard scores (z-scores, T -scores, and normal curve equivalents). For English-Speaking children, Tables B-1 to B-15 in Appendix B may be used to convert raw scores on the eight *LAP-D* subscales, four *LAP-D* domains, and total *LAP-D* to percentile ranks. One table is provided for each one of seven age groups for subscales and again for domains. Tables B-16 to B-18 provide the *LAP-D* age equivalent scores for the eight subscales, four domains, and total *LAP-D* scores, also for English-Speaking children. For Spanish-speaking children, Tables C-1 to C-15 in Appendix C may be used to convert raw scores on the eight *LAP-D* subscales, four *LAP-D* domains, and total *LAP-D* to percentile ranks, and Tables C-16 to C-18 provide the *LAP-D* age equivalent scores for the eight subscales, four domains, and total *LAP-D* scores.

Percentile Ranks

The percentile rank of a score is the percent of individuals in the standardization sample who earned scores at or below the score in question. For example, a child who is 55 months old and obtains a Fine Motor: Manipulation (FM) raw score of 27 has a percentile rank of 86. This indicates that 86% of the children in the standardization sample scored at or below 27. Percentile ranks are particularly useful when interpreting scores to parents. Thus, it is easy for a parent to understand a statement such as, "Your child's score of 27 was higher than 86% of the children of his/her same age group in the standardization sample on Fine Motor: Manipulation."

Caution should be used when presenting scores as percentile ranks. Crocker & Algina (1986) note some misinterpretation results from the fact that percentile rank is a nonlinear transformation of the raw scores. As a result, differences between percentile ranks do not indicate equal-interval amounts of difference for the characteristic being measured. For example, if the percentile ranks of three children on the FM subscale are 70, 80, and 90, respectively, we can conclude that the third child's score is superior to that of the second, and the second child's score is superior to that of the first; but we cannot say the difference between the first and second child is of the same magnitude as the difference between the second and third.

Users of the percentile rank tables should also be aware when interpreting results that percentile ranks are less stable toward the center of the score distribution than they are at the extremes. Therefore, a small difference in raw scores toward the center of the distribution may translate into a larger percentile rank difference than would the same difference at either of the extremes.

Age Equivalent Scores

An age equivalent score indicates the age at which a given raw score may be considered average. For example, if a child is 30 months old and has a raw score on the Gross Motor: Body Movement (GB) subscale equal to an age equivalent score of 42-45 months, this indicates that the child's raw score is equal to the median raw score for a child in the 42-45 month age range in the normative sample. Therefore, age equivalent scores are useful in communicating a child's level of performance when compared with other children at a particular age level. When properly interpreted and understood, age equivalent scores are helpful to parents and teachers in understanding the magnitude of a child's deficit or strength on a particular *LAP-D* subscale.

In this study, age equivalent scores were calculated by determining the median (or mid-point) score for each age range. That is, the score at which 50% of the norming sample scored at or below and 50% scored at or above *within each age range* was considered the age equivalent score for that range. In order to make these scores somewhat more useful, three-month age ranges were used wherever possible. When any given three-month age range was comprised of fewer than 40 children, that age range was combined with the next oldest three month range. In the English-speaking sample, the first three month age range (30-32 months) and the second three month age range (33-35 months) were combined for each subscale. In the Spanish-speaking sample, these two age ranges were also combined, as well as the third age range (36-38 months) and the fourth age range (39-41 months).

Z-Scores

The *z*-score is used to compare an individual's raw score to the mean of the standardization sample. The *z*-score expresses an individual's score in units given in standard deviations. For example, a *z*-score of + 1.0 would mean the child's score was one (1.00) standard deviation unit above the mean of the standardization sample mean. A *z*-score is computed by the formula:

$$z = X - M / \delta X$$

where X is the observed score, M is the mean of the standardization sample, and δX is the standard deviation. *z*-scores are useful in determining whether a child's performance falls far enough below the mean to warrant identification of significant developmental delays and/or the recommendation of special intervention. A widely used principle is to identify any performance as possibly indicating a deficit if the score is 1.5 standard deviations below the mean. Since a *z*-score indicates the number of standard deviations a raw score is above or below the mean, a *z*-score of -1.5 would indicate such a deficit.

T-Scores

A difficulty with standard *z*-scores is that they are given in both positive and negative values. This characteristic makes them somewhat difficult to use when providing feedback to parents. To overcome this difficulty, *z*-scores may be transformed to *t*-scores (McCall, 1970).

t-scores have a mean of 50 points and a standard deviation of 10 points. Interpretations made with respect to *z*-scores are also true for *t*-scores.

Normal Curve Equivalents (NCE)

Normal curve equivalents have a mean of 50 and a standard deviation of 21.06. These scores have been included because they may be required by certain funding agencies as part of programmatic guidelines. NCEs have been associated with a norm-referenced evaluation model for the ESEA Title I Evaluation and Reporting System. NCEs are obtained by making a transformation of the *z*-score as follows.

$$NCE = 50 + 21.06(z)$$

Norming tables are located in Appendices A, B, and C. Appendix A includes the table for obtaining percentile ranks, NCE, *t*-score, and *z*-score and age equivalents. The tables in Appendix B should be used with English-speaking children and the tables in Appendix C should be used with Spanish-speaking children.

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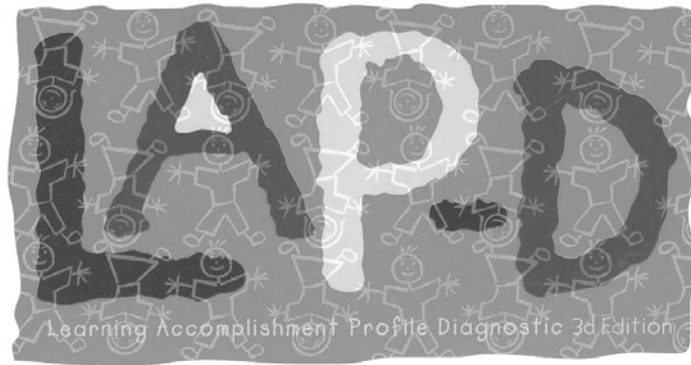
Errata for the
Examiner's Manual & Technical Report

The attached sheets contain revised tables for the sections of:
APPENDIX A
APPENDIX B
APPENDIX C
of the Examiner's Manual & Technical Report, Kaplan item#11954.

Please review the attached letter on page two
for specific changes that were incurred.

These errors will be corrected on the next printing of the
Examiner's Manual & Technical Report.
Please use the tables attached on the following pages
for all assessments going forward from this date.

TABLES REVISED OCTOBER 2006

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Dear *LAP-D* User:

Thank you for using the *Learning Accomplishment Profile-Diagnostic, Third Edition (LAP-D)*! We appreciate your continued confidence in the *LAP-D* assessment's ability to chart the overall development of young children.

In order to ensure that the standard scores, yielded by the *LAP-D,* are both accurate and informative, we have revised the standard tables found in the *Appendix*. The first change you will note is in the *Percentile Tables,* B and C, for both English and Spanish respectively. A "zero percent" ranking and a 100% ranking are no longer possible. The lowest raw score now yields a ranking of "1%;" the highest raw score now yields a ranking of "99%." For example, an English-speaking child—36-41 months, whose raw score falls within the range of 0-5 in *Fine Motor Manipulation* will be ranked at 1%. Similarly, an English-speaking child of the same age, whose raw score in *Fine Motor Manipulation* falls within the 24-28 range, will be ranked at 99%.

A second change will be noted in the *Age Equivalents* table.   A raw score will no longer reference a specific age equivalent; instead, an *age equivalent range* is offered. For example, a raw score of "24," attained by an English-speaking child, in *Fine Motor Manipulation,* yields an *Age Equivalent* range of "54-59 months."

The authors and publisher agree that these alterations to the standard tables will allow professional and paraprofessional users to obtain reliable and useful data that inform the decisions they make relative to the services provided to young children and their families.   If you have questions about the revisions or if you have any issues while using the tables, please contact Larry Griffin at (800) 334-2014, ext. 6115.

Thank you, again, for your interest in the *Learning Accomplishment Profile* (*LAP)* family of screens and assessments.

Larry J Griffin

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Table A-1. Percentile Rank, NCE, *t*-score, and *z*-score Equivalents

%ile Rank	NCE	t Score	z Score	%ile Rank	NCE	t Score	z Score	%ile Rank	NCE	t Score	z Score	%ile Rank	NCE	t Score	z Score
99	99	73	2.33	74	63	56	0.64	49	50	50	-0.02	24	35	43	-0.71
98	93	71	2.05	73	63	56	0.61	48	49	50	-0.05	23	34	43	-0.74
97	90	69	1.88	72	62	56	0.58	47	48	49	-0.08	22	34	42	-0.77
96	87	68	1.75	71	62	56	0.55	46	48	49	-0.10	21	33	42	-0.81
95	85	66	1.64	70	61	55	0.52	45	47	49	-0.13	20	32	42	-0.84
94	83	66	1.56	69	61	55	0.50	44	47	49	-0.15	19	31	41	-0.88
93	81	65	1.48	68	60	55	0.47	43	46	48	-0.18	18	31	41	-0.92
92	79	64	1.40	67	59	54	0.44	42	46	48	-0.20	17	30	41	-0.95
91	78	63	1.34	66	59	54	0.41	41	45	48	-0.23	16	29	40	-1.00
90	77	63	1.28	65	58	54	0.39	40	45	48	-0.25	15	28	40	-1.04
89	76	62	1.23	64	58	54	0.36	39	44	47	-0.28	14	27	39	-1.08
88	75	62	1.18	63	57	53	0.33	38	43	47	-0.31	13	26	39	-1.13
87	74	61	1.13	62	57	53	0.31	37	43	47	-0.33	12	25	38	-1.18
86	73	61	1.08	61	56	53	0.28	36	42	46	-0.36	11	24	38	-1.23
85	72	60	1.04	60	55	53	0.25	35	42	46	-0.39	10	23	37	-1.28
84	71	60	1.00	59	55	52	0.23	34	41	46	-0.41	9	22	37	-1.34
83	70	60	0.95	58	54	52	0.20	33	41	46	-0.44	8	21	36	-1.40
82	69	59	0.92	57	54	52	0.18	32	40	45	-0.47	7	19	35	-1.48
81	69	59	0.88	56	53	52	0.15	31	39	45	-0.50	6	17	34	-1.56
80	68	58	0.84	55	53	51	0.13	30	39	45	-0.52	5	15	34	-1.64
79	67	58	0.81	54	52	51	0.10	29	38	45	-0.55	4	13	33	-1.75
78	66	58	0.77	53	52	51	0.08	28	38	44	-0.58	3	10	31	-1.88
77	66	57	0.74	52	51	51	0.05	27	37	44	-0.61	2	7	30	-2.05
76	65	57	0.71	51	50	50	0.02	26	37	44	-0.64	1	1	27	-2.33
75	64	57	0.68	50	50	50	0.00	25	36	43	-0.68				

Table B-1. Percentile Ranks for *LAP-D* Subscales for Children 30-35 Months

	FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
	Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Mvt.		Object Mvt.	
	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
	20 [a] –28	99	15 [a] –31	99	12 [a] –24	99	15 [a] –33	99	16 [a] –30	99	17 [a] –23	99	23 [a] –34	99	18 [a] –23	99
	19	95	14	97	11	97	14	97	13-15	96	16	97	21-22	96	16-17	95
	18	90	11 – 13	96	10	92	13	94	12	92	15	95	20	95	15	89
	17	82	10	95	9	77	12	89	11	86	14	93	19	94	14	80
	16	72	9	89	8	54	11	84	10	72	13	87	18	92	13	73
	15	62	8	80	7	37	10	75	9	58	12	82	16-17	90	12	67
	14	51	7	60	6	31	9	65	8	45	11	77	15	89	11	58
	13	45	6	37	5	26	8	56	7	37	10	70	14	87	10	45
	12	40	5	23	4	17	7	43	5-6	33	9	61	13	85	9	31
	11	37	4	14	3	8	6	33	4	24	8	50	12	80	8	15
	10	32	3	7	2	3	5	23	3	11	7	44	11	68	7	4
	9	24	0-2 [c]	1	0-1 [c]	2	4	13	2	5	6	40	10	48	0-6 [c]	1
	8	18					3	7	0-1 [c]	4	5	22	9	26		
	7	10					2	3			4	5	8	12		
	6	4					0-1 [c]	1			3	2	7	6		
	5	2									0-2 [c]	1	6	2		
	0-4 [c]	1											0-5 [c]	1		

[a] The highest possible score for this subscale actually exceeds the highest score achieved by this age group in the norming sample. For each subscale, the highest possible scores are as follows: Fine Motor: Manipulation=28, Writing=31; Cognitive: Matching=24, Counting=33; Language: Naming=30, Comprehension=23; Gross Motor: Body Movement=34, Object Movement=23

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-2. Percentile Ranks for *LAP-D* Subscales for Children 36-41 Months

	FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
	Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Mvt.		Object Mvt.	
	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
	24 [a] -28	99	17 [a] -31	99	18 [a] -24	98 [b]	21 [a] -33	99	16 [a] - 30	99	20 [a] -23	99	26 [a] -34	99	22 [a] -23	99
	23	97	16	98	17	97	19-20	98	15	96	19	97	23 - 25	97	20 - 21	97
	22	95	15	97	16	92	18	97	13 - 14	84	18	94	22	95	18 – 19	94
	21	91	14	96	15	85	17	95	12	69	17	90	21	89	17	87
	20	85	13	94	14	80	16	94	11	56	16	80	20	82	16	78
	19	77	12	90	13	77	15	92	10	37	15	70	19	76	15	65
	18	60	11	83	12	69	14	86	9	21	14	62	18	68	14	47
	17	40	10	77	11	54	13	78	8	15	13	48	17	62	13	34
	16	30	9	62	10	38	12	70	7	13	12	32	16	58	12	28
	15	24	8	46	9	22	11	59	5-6	8	11	21	14 - 15	54	11	25
	14	19	7	31	8	11	10	46	3-4	4	10	15	13	50	10	18
	13	16	6	17	7	6	9	36	2	3	9	13	12	45	9	11
	12	14	5	11	3-6	4	8	29	0-1 [c]	1	8	10	11	35	8	5
	11	12	4	9	2	2	7	20			6-7	7	10	21	7	2
	10	9	3	5	0-1 [c]	1	6	12			5	4	9	11	0-6 [c]	1
	9	6	2	2			4-5	7			0-4 [c]	1	8	6		
	8	5	0-1 [c]	1			3	4					0-7 [c]	2		
	7	4					0-2 [c]	2								
	6	2														
	0-5 [c]	1														

[a] The highest possible score for this subscale actually exceeds the highest score achieved by this age group in the norming sample. For each subscale, the highest possible scores are as follows: Fine Motor: Manipulation=28, Writing=31; Cognitive: Matching=24, Counting=33; Language: Naming=30, Comprehension=23; Gross Motor: Body Movement=34, Object Movement=23

[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-3. Percentile Ranks for *LAP-D* Subscales for Children 42-47 Months

FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Mvt.		Object Mvt.	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
26 [a]-28	99	28 [a]-31	99	22 [a]-24	99	31 [a]-33	99	25 [a]-30	99	22-23	98 [b]	30 [a]-34	99	23	99
25	98	25-27	98	21	98	28-30	98	23-24	98	21	95	28-29	98	22	98
24	94	22-24	97	20	96	26-27	97	22	97	20	91	27	97	21	96
23	87	21	95	19	94	24-25	96	21	96	19	86	26	96	20	92
22	75	20	94	18	91	22-23	95	20	95	18	78	25	94	19	87
21	63	19	92	17	84	21	93	19	93	17	68	24	91	18	80
20	55	18	90	16	74	20	91	18	91	16	58	23	85	17	71
19	40	17	87	15	63	19	90	17	89	15	49	22	75	16	58
18	18	16	83	14	55	18	88	16	84	14	43	21	63	15	42
17	6	15	76	13	49	17	86	15	79	13	31	20	52	14	26
16	3	14	70	12	40	16	79	14	74	12	20	19	44	13	17
0-15 [c]	1	13	63	11	26	15	68	13	68	11	12	18	38	12	14
		12	58	10	15	14	57	12	54	10	7	17	33	11	12
		11	51	9	8	13	44	11	36	8-9	5	16	30	10	10
		10	40	8	4	12	31	10	21	6-7	4	15	28	9	7
		9	28	7	2	11	20	9	12	5	3	14	24	0-8 [c]	3
		8	18	0-6 [c]	1	10	14	8	7	0-4 [c]	2	13	19		
		7	10			9	10	7	4			12	16		
		6	4			8	7	6	2			11	10		
		5	3			7	4	0-5 [c]	1			10	3		
		0-4 [c]	1			4-6	2					0-9 [c]	1		
						0-3 [c]	1								

[a] The highest possible score for this subscale actually exceeds the highest score achieved by this age group in the norming sample. For each subscale, the highest possible scores are as follows: Fine Motor: Manipulation=28, Writing=31; Cognitive: Matching=24, Counting=33; Language: Naming=30, Comprehension=28; Gross Motor: Body Movement=34, Object Movement=23.
[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.
[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-4. Percentile Ranks for *LAP-D* Subscales for Children 48-53 Months

| FINE MOTOR | | | | COGNITIVE | | | | LANGUAGE | | | | GROSS MOTOR | | | |
| Manipulation | | Writing | | Matching | | Counting | | Naming | | Comprehension | | Body Mvt. | | Object Mvt. | |
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
28	99	30[a]-31	99	23[a]-24	99	31[a]-33	99	26[a]-30	99	23	99	32[a]-34	99	23	98[b]
27	98	27-29	98	22	98	29-30	98	25	98	22	97	30-31	97	22	95
26	97	26	97	21	94	27-28	97	24	97	21	93	29	94	21	90
25	92	25	95	20	89	26	95	23	96	20	87	28	90	20	82
24	79	24	93	19	84	25	93	22	95	19	78	27	86	19	74
23	63	23	92	18	77	24	92	21	93	18	66	26	79	18	62
22	47	22	90	17	64	23	90	20	90	17	51	25	68	17	41
21	35	21	87	16	50	22	88	19	85	16	36	24	54	16	22
20	29	20	84	15	37	21	87	18	78	15	28	23	38	15	10
19	21	19	78	14	30	20	85	17	71	14	24	22	20	14	4
18	9	18	72	13	26	19	81	16	65	13	17	21	8	12-13	2
0-17[c]	2	17	67	12	19	18	76	15	59	12	10	20	4	0-11[c]	1
		16	58	11	13	17	70	14	52	11	6	19	3		
		15	45	10	8	16	54	13	45	10	3	17-18	2		
		14	38	9	5	15	35	12	32	5-9	2	0-16[c]	1		
		13	34	8	3	14	25	11	21	0-4[c]	1				
		12	30	7	2	13	17	10	12						
		11	25	0-6[c]	1	12	13	9	4						
		10	20			11	10	7-8	2						
		9	12			10	6	0-6[c]	1						
		8	5			9	5								
		0-7[c]	2			8	4								
						0-7[c]	2								

[a] The highest possible score for this subscale actually exceeds the highest score achieved by this age group in the norming sample. For each subscale, the highest possible scores are as follows: Fine Motor: Manipulation=28, Writing=31; Cognitive: Matching=24, Counting=33; Language: Naming=30, Comprehension=23; Gross Motor: Body Movement=34, Object Movement=23

[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-5. Percentile Ranks for *LAP-D* Subscales for Children 54-59 Months

FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Mvt.		Object Mvt.	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
28	98[b]	30-31	98[b]	24	98[b]	33	99	30	99	23	97[b]	34	99	23	97[b]
27	95	29	95	23	92	32	98	29	98	22	90	33	98	22	90
26	83	28	92	22	84	31	97	28	96	21	78	32	96	21	79
25	67	27	88	21	78	30	95	27	94	20	61	31	92	20	63
24	48	26	84	20	74	29	94	26	90	19	47	30	86	19	51
23	32	25	81	19	64	28	90	25	86	18	34	29	78	18	38
22	26	24	77	18	50	27	86	24	84	17	24	28	67	17	22
21	20	23	72	17	33	26	82	23	82	16	18	27	58	16	12
20	15	22	67	16	19	25	78	22	79	15	15	26	51	15	5
19	8	21	59	15	10	24	76	21	74	14	13	25	37	0-14[c]	1
0-18[c]	2	20	49	14	5	23	72	20	69	13	8	24	24		
		19	42	12-13	4	22	68	19	63	12	3	23	15		
		18	37	11	3	21	65	18	52	0-11[c]	1	22	7		
		17	33	0-10[c]	1	20	61	17	43			0-21[c]	3		
		16	26			19	55	16	36						
		15	18			18	47	15	32						
		14	16			17	40	14	29						
		13	13			16	28	13	26						
		12	11			15	15	12	19						
		11	9			14	9	11	10						
		10	7			13	5	10	5						
		9	4			12	4	9	2						
		8	2			11	3	0-8[c]	1						
		0-7[c]	1			10	2								
						0-9[c]	1								

[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-6. Percentile Ranks for *LAP-D* Subscales for Children 60-65 Months

FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Mvt.		Object Mvt.	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
28	95[b]	31	98[b]	24	95[b]	33	99	30	99	23	95[b]	34	98[b]	23	91[b]
27	85	30	93	23	81	32	97	29	98	22	80	33	91	22	76
26	65	29	83	22	61	31	94	28	94	21	57	32	78	21	59
25	40	28	72	21	46	30	89	27	85	20	36	31	65	20	40
24	23	27	64	20	38	29	83	26	77	19	22	30	52	19	27
23	16	26	59	19	30	28	79	25	73	18	16	29	38	18	20
22	11	25	54	18	20	27	73	24	70	17	11	28	30	17	11
21	8	24	48	17	11	26	66	23	66	16	6	27	26	16	4
20	6	23	41	16	5	25	62	22	61	15	4	26	22	0-15[c]	1
19	3	22	30	15	3	24	59	21	57	13 – 14	3	25	18		
0-18[c]	1	21	22	0-14[c]	1	23	55	20	47	12	2	24	11		
		20	17			22	50	19	34	0-11[c]	1	23	4		
		19	12			21	44	18	25			0-22[c]	1		
		18	8			20	38	17	20						
		16-17	7			19	30	16	19						
		15	5			18	25	15	15						
		12-14	4			17	22	14	12						
		11	2			16	16	13	10						
		0-10[c]	1			15	9	12	7						
						14	5	11	4						
						11-13	2	10	3						
						0-10[c]	1	9	2						
								0-8[c]	1						

[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-7. Percentile Ranks for *LAP-D* Subscales for Children 66-72 Months

FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Mvt.		Object Mvt.	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
28	89 [b]	31	91 [b]	24	83 [b]	33	95 [b]	30	97 [b]	23	81 [b]	34	92 [b]	23	83 [b]
27	69	30	73	23	56	32	83	29	91	22	52	33	75	22	57
26	42	29	50	22	37	31	70	28	80	21	33	32	55	21	38
25	20	28	35	21	24	30	60	27	68	20	18	31	39	20	23
24	10	27	27	20	20	29	50	26	58	19	7	30	26	19	14
23	6	26	20	19	17	28	40	25	50	16 – 18	2	29	15	18	8
22	4	25	18	18	12	27	35	24	46	0-15 [c]	1	28	11	17	4
21	2	24	16	17	7	26	31	23	42			26 – 27	8	0-16 [c]	1
0-20 [c]	1	23	15	16	3	25	29	22	36			25	5		
		22	12	0-15 [c]	1	24	27	21	30			23 – 24	3		
		21	10			23	23	20	22			0-22 [c]	1		
		18-20	7			22	19	19	13						
		17	6			21	17	18	7						
		16	4			20	15	17	5						
		0-15 [c]	1			19	11	16	4						
						18	8	13 – 15	3						
						17	7	12	2						
						16	4	0-11 [c]	1						
						15	2								
						0-14 [c]	1								

[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.
[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-8. Percentile Ranks for *LAP-D* Domains for Children 30-35 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	**%ile RANK**	**RAW SCORE**	**%ile RANK**	**RAW SCORE**	**%ile RANK**	**RAW SCORE**	**%ile RANK**
34-59	98	24-57	98	30-53	98	37-57	98
33	97	23	97	29	97	36	97
31 – 32	96	22	95	26 – 28	94	35	96
29 – 30	95	21	93	25	90	34	94
28	94	20	88	24	87	32 – 33	93
26 – 27	91	19	80	23	84	31	92
25	87	18	73	22	81	30	91
24	82	17	67	21	78	29	90
23	74	16	60	20	72	28	88
22	65	15	51	19	66	26 - 27	85
21	58	14	43	18	62	25	80
20	51	13	36	17	57	24	76
19	44	12	27	16	55	23	68
18	39	11	20	15	50	22	58
17	35	10	15	14	43	21	50
16	30	9	13	13	36	20	43
15	25	8	9	12	28	19	32
14	19	7	6	11	24	18	21
13	12	6	4	10	23	17	14
12	7	5	3	9	18	16	7
11	4	0-4 [c]	1	8	10	15	5
0-10 [c]	1			7	6	14	3
				6	5	13	2
				5	3	0-12 [c]	1
				0-4 [c]	1		

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

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Table B-9. Percentile Ranks for *LAP-D* Domains for Children 36-41 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
38-59	99	36-57	99	34-53	98	44 - 57	99
35 – 37	98	34 - 35	97	33	96	41 - 43	98
34	95	33	96	32	95	39 - 40	97
33	91	32	95	31	93	38	95
32	88	30 - 31	94	30	91	37	93
31	84	29	91	29	88	36	90
30	80	28	87	28	83	35	83
29	77	27	83	27	77	34	77
28	71	26	77	26	70	33	72
27	63	25	71	25	64	32	66
26	54	24	67	24	57	31	62
25	45	23	63	23	46	30	59
24	38	22	56	22	36	29	54
23	32	21	50	21	30	28	50
22	27	20	44	20	25	27	46
21	25	19	35	19	20	26	41
20	22	18	29	18	17	25	35
19	19	17	24	17	14	24	30
18	15	16	19	16	13	23	26
17	10	15	15	15	11	22	21
15 – 16	6	14	11	14	10	21	17
14	5	13	9	13	9	20	14
13	4	12	7	12	8	19	10
0-12 c	2	11	5	11	7	18	5
		10	4	10	6	14 - 17	2
		8 - 9	3	9	4	0-13 c	1
		7	2	8	2		
		0-6 c	1	0-7 c	1		

c Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-10. Percentile Ranks for *LAP-D* Domains for Children 42-47 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
53-59	99	49-57	99	47-53	99	49-57	99
47 - 52	98	48	98	42 - 46	98	46 - 48	98
46	97	47	97	41	96	45	96
44 - 45	96	42 - 46	96	39 - 40	94	43 - 44	95
43	95	41	95	38	92	42	93
42	93	40	94	37	91	41	89
41	91	39	93	36	89	40	83
40	89	38	92	35	88	39	77
39	88	37	91	34	85	38	73
38	87	36	90	33	81	37	67
37	85	35	88	32	77	36	60
36	80	34	87	31	71	35	52
35	74	33	85	30	65	34	46
34	67	32	80	29	60	33	40
33	60	31	75	28	56	32	37
32	52	30	71	27	50	31	32
31	46	29	65	26	44	30	26
30	41	28	57	25	38	29	23
29	34	27	51	24	33	28	21
28	26	26	47	23	25	27	15
27	19	25	41	22	17	26	11
26	14	24	31	21	13	25	8
25	9	23	23	20	10	24	6
24	6	22	20	19	8	23	4
23	5	21	16	18	6	22	3
22	3	20	13	17	5	20 - 21c	2
0-21c	1	19	10	16	4	0-19c	1
		18	8	13 - 15	3		
		17	5	9 - 12	2		
		16	3	0-8c	1		
		15	2				
		0-14c	1				

c Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

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Table B-11. Percentile Ranks for *LAP-D* Domains for Children 48-53 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
57-59	99	51-57	99	49-53	99	54-57	99
54 - 56	98	48 - 50	98	47 - 48	98	51 - 53	98
51 - 53	97	47	97	44 - 46	97	50	96
50	95	46	95	43	96	49	93
49	94	44 - 45	94	42	95	48	91
48	93	43	93	41	93	47	88
47	91	42	91	40	92	46	85
46	89	41	90	39	89	45	80
45	87	40	89	38	84	44	73
44	84	39	87	37	79	43	65
43	80	38	84	36	75	42	56
42	77	37	80	35	70	41	47
41	73	36	77	34	67	40	38
40	67	35	72	33	65	39	27
39	63	34	65	32	61	38	17
38	58	33	57	31	55	37	11
37	53	32	51	30	49	36	6
36	47	31	46	29	40	35	5
35	39	30	42	28	31	33 – 34	4
34	34	29	36	27	25	32	3
33	29	28	29	26	21	30 – 31	2
32	25	27	24	25	17	0-29	1
31	21	26	21	24	14		
30	18	25	17	23	12		
29	15	24	12	22	9		
28	11	23	9	21	6		
27	6	22	8	20	4		
26	3	21	6	11 – 19	2		
0-25 c	1	20	5	0-10 c	1		
		19	3				
		0-18 c	1				

c Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-12. Percentile Ranks for *LAP-D* Domains for Children 54-59 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
59	99	56-57	99	53	99	56-57	99
57 - 58	98	55	98	51 - 52	98	55	98
56	97	54	97	50	96	54	97
55	95	53	96	49	95	53	96
54	92	52	94	48	93	52	93
53	89	51	93	47	91	51	89
52	87	50	91	46	89	50	84
51	85	49	89	45	87	49	77
50	81	48	87	44	84	48	70
49	75	47	86	43	80	47	65
48	72	46	84	42	77	46	58
47	68	45	81	41	74	45	49
46	64	44	78	40	69	44	40
45	58	43	76	39	64	43	31
44	51	42	72	38	58	42	23
43	47	41	68	37	53	41	20
42	43	40	65	36	47	40	15
41	38	39	62	35	43	39	8
40	34	38	57	34	37	38	4
39	29	37	51	33	31	37	3
38	26	36	47	32	27	36	2
37	22	35	40	31	22	0-35 c	1
36	18	34	33	30	19		
35	15	33	26	29	16		
34	12	32	19	28	14		
33	9	31	14	27	12		
32	8	30	10	26	11		
31	6	29	7	25	9		
30	5	28	6	24	6		
29	3	27	4	23	4		
0-28 c	1	25 - 26	3	22	2		
		24	2	0-21 c	1		
		0-23 c	1				

c Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-13. Percentile Ranks for *LAP-D* Domains for Children 60-65 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
59	99	57	99	51-53	97	56-57	97
58	98	55 - 56	97	50	93	55	91
57	94	54	94	49	87	54	84
56	87	53	91	48	80	53	79
55	80	52	86	47	77	52	70
54	73	51	82	46	74	51	59
53	66	50	77	45	70	50	49
52	62	49	73	44	67	49	42
51	58	48	70	43	64	48	36
50	54	47	67	42	57	47	30
49	47	46	63	41	49	46	24
48	40	45	60	40	43	45	19
47	32	44	55	39	35	44	13
46	26	43	49	38	29	43	8
45	22	42	45	37	24	42	6
44	19	41	41	36	21	41	4
43	15	40	35	35	18	40	3
42	12	39	29	34	16	0-39 c	1
41	11	38	26	33	13		
40	8	37	23	32	12		
39	7	36	20	31	9		
38	6	35	17	30	7		
37	5	34	13	27 - 29	6		
35 – 36	3	33	9	26	5		
31 – 34	2	32	7	25	4		
0-30 c	1	31	5	23 – 24	2		
		30	4	0-22 c	1		
		29	3				
		27 - 28	2				
		0-26 c	1				

c Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-14. Percentile Ranks for *LAP-D* Domains for Children 66-72 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
59	96	57	96	53	98	57	94
58	89	56	88	52	94	56	82
57	76	55	78	51	85	55	72
56	62	54	69	50	75	54	63
55	48	53	61	49	66	53	52
54	36	52	55	48	59	52	40
53	29	51	50	47	55	51	32
52	25	50	44	46	51	50	25
51	21	49	40	45	47	49	19
50	18	48	38	44	41	48	14
49	17	47	35	43	33	47	10
48	15	46	31	42	24	46	8
47	13	45	26	41	20	45	6
46	11	44	21	40	17	44	5
45	9	43	18	39	11	43	4
43 – 44	7	42	15	38	6	42	2
42	6	41	14	34 – 37	4	0-41 [c]	1
41	4	40	12	32 – 33	3		
39 – 40	2	38 – 39	9	29 – 31	2		
0-38 [c]	1	37	7	0-28 [c]	1		
		36	6				
		35	5				
		34	4				
		33	3				
		32	2				
		0-31 [c]	1				

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-15. Percentile Ranks for *LAP-D* Total Scores

30-35 MONTHS		36-41 MONTHS		42-47 MONTHS		48-53 MONTHS		54-59 MONTHS		60-65 MONTHS		66-72 MONTHS	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
99-226	96	134-226	99	187-226	99	196-226	99	210-226	99	215-226	99	223-226	99
98	94	133	97	166 - 186	98	190 - 195	98	207 - 209	98	212 - 214	98	222	97
97	92	132	96	160 - 165	97	184 - 189	97	202 - 206	97	211	96	221	96
94 - 96	90	128 - 131	95	159	96	177 - 183	96	200 - 201	96	210	95	220	95
93	87	127	94	156 - 158	95	171 - 176	95	198 - 199	95	208 - 209	94	219	93
91 - 92	86	124 - 126	93	154 - 155	94	170	94	197	93	207	93	218	89
90	85	123	92	152 - 153	93	169	92	196	92	206	91	217	86
89	84	122	91	151	92	168	91	193 - 195	91	205	90	216	84
88	83	121	89	150	91	166 - 167	90	191 - 192	90	204	89	215	82
87	82	120	88	149	90	165	88	190	89	203	86	214	80
86	81	119	86	148	89	164	87	189	88	202	84	213	77
85	79	118	85	147	88	163	86	188	86	201	82	211 - 212	72
84	77	117	83	143 - 146	87	162	85	187	85	199 - 200	80	210	68
83	75	116	81	142	86	161	83	186	83	198	78	209	63
82	73	115	79	140 - 141	84	160	82	184 - 185	82	197	76	208	61
81	71	114	78	139	83	159	81	183	81	196	75	207	59
80	70	113	77	138	82	158	79	182	80	195	73	206	56
79	67	112	75	137	80	157	77	181	79	194	71	205	50
78	66	109 - 111	72	135 - 136	78	156	76	180	77	193	68	204	46
77	65	108	69	134	76	155	75	179	76	192	66	202 - 203	43
76	62	107	65	133	74	154	74	178	75	191	65	200 - 201	39

30-35 MONTHS		36-41 MONTHS		42-47 MONTHS		48-53 MONTHS		54-59 MONTHS		60-65 MONTHS		66-72 MONTHS	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
75	58	106	64	132	73	153	73	177	74	190	62	199	36
74	55	105	63	131	71	152	71	176	73	189	59	198	34
73	53	104	60	130	69	151	69	175	72	188	56	197	33
72	50	103	57	129	67	150	67	174	71	187	54	196	31
71	47	102	54	128	65	149	64	172 - 173	69	186	53	195	29
70	46	100 - 101	52	127	63	148	62	171	67	185	50	194	27
69	43	99	50	126	61	146 - 147	60	170	65	184	49	191 - 193	24
67 - 68	38	98	47	125	59	144 - 145	58	169	63	183	48	190	23
64 - 66	36	97	44	124	57	143	57	168	62	182	45	189	22
63	34	94 - 96	42	123	56	142	56	167	60	181	42	188	21
60 - 62	30	92 - 93	41	122	55	141	54	166	58	180	39	187	20
59	26	91	40	121	54	140	51	165	55	179	38	185 - 186	18
58	23	90	39	120	52	139	49	164	53	178	36	184	17
57	19	89	36	119	49	138	48	163	51	177	35	183	16
56	15	88	32	118	47	137	46	162	50	176	34	182	15
53 - 55	14	87	31	117	46	136	43	161	49	175	33	179 - 181	13
52	11	86	30	116	44	134 - 135	41	160	47	174	32	178	11
48 - 51	8	85	28	115	42	133	39	159	45	173	31	172 - 177	9
47	7	84	27	114	40	132	37	158	43	172	30	170 - 171	8
45 - 46	5	83	26	113	38	131	35	157	41	171	29	169	7
44	3	82	25	112	35	130	33	156	39	170	28	167 - 168	6
42 - 43	2	81	23	111	33	129	31	155	37	169	27	166	5
0-41 ᶜ	1	80	22	110	31	128	29	154	36	168	26	162 - 165	4

30-35 MONTHS		36-41 MONTHS		42-47 MONTHS		48-53 MONTHS		54-59 MONTHS		60-65 MONTHS		66-72 MONTHS	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
		78 - 79	20	109	29	127	26	153	34	167	24	160 - 161	3
		77	18	108	28	126	22	151 - 152	32	166	22	158 - 159	2
		75 - 76	16	107	26	124 - 125	19	150	31	165	21	0-157 c	1
		74	14	106	24	123	18	149	29	164	19		
		73	13	105	22	122	17	148	27	163	17		
		72	11	104	19	121	16	147	25	161 - 162	15		
		71	10	103	17	120	15	146	23	160	13		
		69 - 70	8	102	16	119	12	145	21	159	11		
		65 - 68	7	101	15	117 - 118	10	144	19	156 - 158	9		
		64	6	99 - 100	14	116	7	143	18	155	8		
		61 - 63	5	98	13	115	5	142	16	151 - 154	7		
		56 - 60	4	97	12	112 - 114	4	141	14	149 - 150	6		
		47 - 55	3	96	10	111	3	139 - 140	13	148	5		
		46	2	94 - 95	9	100 - 110	2	138	12	145 - 147	4		
		0-45 c	1	93	8	0-99 c	1	137	11	139 - 144	3		
				91 - 92	6			136	9	136 - 138	2		
				90	5			135	8	0-135 c	1		
				88 - 89	4			133 - 134	7				
				87	3			131 - 132	6				
				85 - 86	2			127 - 130	5				
				0-84 c	1			126	4				
								120 - 125	3				
								119	2				

30-35 MONTHS		36-41 MONTHS		42-47 MONTHS		48-53 MONTHS		54-59 MONTHS		60-65 MONTHS		66-72 MONTHS	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
								0-118 [c]	1				

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table B-16. English Age Equivalents for *LAP-D* Subscales

| FINE MOTOR | | | | COGNITIVE | | | | | | LANGUAGE | | GROSS MOTOR | | | |
| Manipulation | | Writing | | Matching | | Counting | | Naming | | Comprehension | | Body Movement | | Object Movement | |
RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.
27-28	72	30-31	72	24	72	30-33	72	27-30	72	23	72	33-40	72	23	72
26	63-72	29	66-72	23	66-72	29	69-72	26	69-72	22	66-72	32	66-72	22	69-72
25	60-62	27-28	63-65	22	63-65	27-28	66-68	22-25	66-68	21	63-65	30-31	60-65	21	63-68
24	54-59	23-26	60-62	20-21	60-62	26	63-65	21	63-65	20	57-62	27-29	57-59	20	57-62
22-23	48-53	21-22	57-59	18-19	54-59	20-25	60-62	19-20	60-62	19	54-56	25-26	54-56	18-19	51-56
21	45-47	19-20	54-56	16-17	48-53	19	57-59	17-18	54-59	17-18	48-53	24	51-53	17	48-50
19-20	42-44	16-18	51-53	15	45-47	17-18	54-56	14-16	51-53	16	45-47	23	48-50	16	45-47
18	39-41	15	48-50	12-14	42-44	16	48-53	13	48-50	14-15	42-44	20-22	45-47	15	39-44
17	36-38	11-14	45-47	11	39-41	14-15	45-47	12	45-47	13	39-41	19	42-44	13-14	36-38
13-16	30-35	9-10	39-44	10	36-38	13	42-44	11	39-44	12	36-38	13-18	39-41	10-12	30-35
0-12	<30	7-8	30-38	8-9	30-35	11-12	39-41	9-10	36-38	8-11	30-35	12	36-38	0-9	<30
		0-6	<30	0-7	<30	9-10	36-38	8	30-35	0-7	<30	10-11	30-35		
						8	30-35	0-7	<30			0-9	<30		
						0-7	<30								

Table C-1. Percentile Ranks for *LAP-D* Subscales for Children 30-35 Months

FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Movement		Object Movement	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
24[a]	99	19[a]	99	17[a]	99	15[a]	99	14[a]	99	16[a]	99	23[a]	98	23	98[b]
23	98	18	98	16	98	14	98	13	98	15	98	18-22	96	16-22	96
17-22	96	11-17	97	12-15	97	13	94	12	96	13-14	96	16-17	93	15	93
16	93	10	96	11	96	11-12	90	11	94	12	94	15	91	14	87
15	91	9	91	10	94	10	88	9-10	91	11	92	14	87	13	75
14	86	8	84	9	90	9	84	8	83	10	88	12-13	84	12	67
13	81	7	68	8	84	8	77	7	71	9	82	11	72	11	59
12	77	6	47	7	73	7	62	6	64	8	73	10	48	10	47
11	72	5	30	6	63	6	47	5	58	7	60	9	24	9	40
10	64	4	21	5	55	5	35	4	43	6	49	8	13	8	25
9	46	3	14	4	42	4	24	3	30	5	36	7	6	7	7
8	27	2	6	3	29	3	15	2	21	4	20	0-6[c]	1	0-6[c]	1
7	17	1	3	2	18	2	9	1	10	3	10				
6	12	0[c]	1	1	10	1	4	0[c]	3	2	5				
5	7			0[c]	3	0[c]	1			1	3				
4	3									0[c]	1				
0-3[c]	1														

[a] The highest possible score for this subscale actually exceeds the highest score achieved by this age group in the norming sample. For each subscale, the highest possible scores are as follows: Fine Motor: Manipulation=28, Writing=31; Cognitive: Matching=24, Counting=33; Language: Naming=30, Comprehension=34; Gross Motor: Body Movement=34, Object Movement=23

[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-2. Percentile Ranks for *LAP-D* Subscales for Children 36-41 Months

FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Movement		Object Movement	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
24-28[a]	99	20[a]-31	99	23[a]-24	99	17[a]-31	98[b]	18[a]-30	99	19[a]-23	99	24[a]-34	99	23	99
23	98	19	98	22	98	16	97	17	98	16-18	98	23	98	21-22	98
21 – 22	96	15 – 18	97	16 – 21	97	15	93	12-16	96	15	97	22	97	19 – 20	97
20	92	14	95	15	96	14	92	11	91	14	93	21	95	18	95
19	86	13	94	14	94	13	90	10	81	13	90	20	91	17	91
18	76	12	92	13	91	12	87	9	64	12	81	17 – 19	88	16	86
17	63	11	84	12	85	11	81	8	50	11	66	16	85	15	80
16	50	10	74	11	77	10	68	7	39	10	47	15	80	14	64
15	37	9	62	10	63	9	52	6	30	9	29	14	71	13	46
14	27	8	52	9	39	8	38	5	23	8	18	13	56	12	39
13	20	7	37	8	22	7	29	4	12	7	12	12	42	11	35
12	16	6	18	7	16	6	22	3	5	6	10	11	28	10	28
11	13	5	10	5-6	12	5	16	0-2[c]	3	4-5	8	10	20	9	24
10	10	4	8	4	8	4	12			3	4	9	14	8	14
9	6	3	4	3	4	3	7			2	3	8	8	7	3
7 – 8	4	0-2[c]	1	1-2	2	2	5			0-1[c]	2	7	4	0-6[c]	1
0-6[c]	2			0[c]	1	1	3					0-6[c]	1		
						0[c]	1								

[a] The highest possible score for this subscale actually exceeds the highest score achieved by this age group in the norming sample. For each subscale, the highest possible scores are as follows: Fine Motor: Manipulation=28, Writing=31; Cognitive: Matching=24, Counting=33; Language: Naming=30, Comprehension=23; Gross Motor: Body Movement=34, Object Movement=23.

[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-3. Percentile Ranks for *LAP-D* Subscales for Children 42-47 Months

FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Movement		Object Movement	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
26[a]-28	99	23[a]-31	99	20[a]-24	99	17[a]-33	95[b]	20[a]-23	99	20[a]	99	32[a]-34	99	23	99
25	98	21-22	97	18-19	97	15-16	89	19	96	16-19	98	26-31	98	22	98
24	97	18-20	95	17	95	14	80	18	91	15	97[b]	25	95	21	97
23	93	17	93	16	90	13	66	17	89	13-14	92	24	90	20	95
22	87	16	88	15	84	12	54	16	86	12	82	23	84	19	92
21	79	15	78	14	81	11	38	15	84	11	71	22	78	18	89
20	71	14	69	13	77	10	24	14	79	10	53	21	70	17	79
19	56	13	64	12	67	9	18	13	65	9	29	20	63	16	62
18	30	12	54	11	49	8	13	12	46	8	15	19	55	15	47
17	12	11	45	10	31	7	10	11	28	7	10	18	46	14	35
16	4	10	38	9	14	6	9	10	12	6	7	17	37	13	27
15	2	9	28	8	4	5	7	9	6	5	6	16	32	12	24
0-14[c]	1	8	21	7	3	4	5	6-8	4	4	5	15	29	11	21
		7	12	5-6	2	3	3	5	2	3	4	14	24	10	16
		6	4	0-4[c]	1	0-2[c]	1	0-4[c]	1	2	2	13	20	9	13
		0-5[c]	2							0-1[c]	1	12	17	8	7
												11	12	0-7[c]	1
												10	5		
												0-9[c]	2		

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[a] The highest possible score for this subscale actually exceeds the highest score achieved by this age group in the norming sample. For each subscale, the highest possible scores are as follows: Fine Motor: Manipulation=28, Writing=31; Cognitive: Matching=24, Counting=33; Language: Naming=30, Comprehension=23; Gross Motor: Body Movement=34, Object Movement=23

[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-4. Percentile Ranks for *LAP-D* Subscales for Children 48-53 Months

FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Movement		Object Movement	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
28	99	26a–31	98	23a–24	99	23a–33	99	28a–30	99	22a–23	99	32a–34	99	23	98b
27	97	25	97	22	98	20–22	98	25–27	98	20–21	98	31	98	22	95
26	95	23–24	96	21	96	19	96	19–24	96	19	96	30	96	21	91
25	90	22	93	20	94	18	94	18	95	18	91	29	94	20	84
24	82	21	90	19	90	17	92	17	92	17	85	28	92	19	76
23	71	20	88	18	85	16	81	16	89	16	78	27	89	18	64
22	58	19	84	17	76	15	68	15	87	15	69	26	82	17	45
21	46	18	78	16	65	14	52	14	84	14	59	25	73	16	25
20	37	17	70	15	54	13	32	13	79	13	45	24	61	15	11
19	23	16	59	14	45	12	20	12	64	12	30	23	45	14	6
18	9	15	46	13	37	11	14	11	47	11	21	22	28	13	4
0–17c	2	14	36	12	27	10	9	10	32	10	14	21	17	11–12	3
		13	31	11	16	9	6	9	16	9	8	20	10	10	2
		12	27	10	7	8	5	8	9	8	5	19	8	0–9c	1
		11	22	0–9c	2	7	4	7	5	7	3	18	7		
		10	16			6	2	6	4	0–6c	1	17	5		
		9	10			0–5c	1	5	3			16	4		
		8	5					3–4	2			13–15	3		
		7	2					0–2c	1			11–12	2		
		0–6c	1									0–10c	1		

[a] The highest possible score for this subscale actually exceeds the highest score achieved by this age group in the norming sample. For each subscale, the highest possible scores are as follows: Fine Motor: Manipulation=28, Writing=31; Cognitive: Matching=24, Counting=33; Language: Naming=30, Comprehension=23; Gross Motor: Body Movement=34, Object Movement=23

[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-5. Percentile Ranks for *LAP-D* Subscales for Children 54-59 Months

FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Movement		Object Movement	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
28	99	31	99	24	99	28[a]-33	99	27[a]-30	99	22[a]-23	99	33[a]-34	98[b]	23	97[b]
27	94	30	98	23	98	25-27	98	24-26	98	21	98	32	96	22	90
26	84	29	97	22	94	23-24	97	23	97	20	93	31	90	21	76
25	65	28	94	21	88	22	96	22	95	19	84	30	84	20	60
24	44	27	92	20	80	21	94	21	93	18	72	29	77	19	49
23	27	26	90	19	69	20	93	20	91	17	58	28	67	18	35
22	16	25	87	18	55	19	91	19	89	16	43	27	58	17	21
21	11	24	82	17	39	18	89	18	85	15	35	26	50	16	11
20	8	23	79	16	24	17	87	17	80	14	32	25	34	15	6
19	3	22	75	15	15	16	68	16	75	13	23	24	21	14	3
0-18[c]	1	21	68	14	10	15	46	15	68	12	14	23	12	13	2
		20	60	13	9	14	30	14	61	11	8	22	6	0-12[c]	1
		19	51	12	6	13	13	13	54	10	3	0-21[c]	2		
		18	44	11	3	12	6	12	40	6-9	2				
		17	38	0-10[c]	1	11	4	11	26	0-5[c]	1				
		16	29			10	3	10	15						
		15	18			8-9	2	9	5						
		14	12			0-7[c]	1	8	3						
		13	8					7	2						
		12	5					0-6[c]	1						
		11	4												
		10	2												
		0-9[c]	1												

[a] The highest possible score for this subscale actually exceeds the highest score achieved by this age group in the norming sample. For each subscale, the highest possible scores are as follows: Fine Motor: Manipulation=28, Writing=31; Cognitive: Matching=24, Counting=33; Language: Naming=30, Comprehension=23; Gross Motor: Body Movement=34, Object Movement=23.

[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-6. Percentile Ranks for *LAP-D* Subscales for Children 60-65 Months

FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Movement		Object Movement	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
28	97[b]	31	99	24	98[b]	31[a]-33	99	29[a]-30	99	23	99	34	97[b]	23	90[b]
27	88	30	97	23	91	29-30	98	27 - 28	98	22	97	33	87	22	69
26	67	29	92	22	74	28	97	26	97	21	87	32	72	21	50
25	40	28	84	21	55	27	96	25	94	20	67	31	59	20	34
24	20	27	77	20	40	26	94	24	91	19	42	30	49	19	26
23	12	26	67	19	26	25	93	23	88	18	27	29	41	18	18
22	8	25	58	18	12	24	91	22	83	17	21	28	35	17	8
21	5	24	51	17	6	23	88	21	75	16	15	27	31	0-16[c]	2
20	3	23	41	16	2	22	86	20	63	15	12	26	27		
0-19[c]	1	22	27	0-15[c]	1	21	84	19	48	13 – 14	9	25	17		
		21	17			20	81	18	40	12	5	24	7		
		20	13			19	74	17	37	11	3	0-23[c]	2		
		19	10			18	67	16	34	10	2				
		18	8			17	62	15	30	0-9[c]	1				
		16 – 17	6			16	46	14	27						
		15	4			15	27	13	25						
		14	3			14	15	12	16						
		13	2			13	5	11	6						
		0-12[c]	1			12	2	10	3						
						0-11[c]	1	0-9[c]	1						

[a] The highest possible score for this subscale actually exceeds the highest score achieved by this age group in the norming sample. For each subscale, the highest possible scores are as follows: Fine Motor: Manipulation=28, Writing=31; Cognitive: Matching=24, Counting=33; Language: Naming=30, Comprehension=23; Gross Motor: Body Movement=34, Object Movement=23.
[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.
[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-7. Percentile Ranks for *LAP-D* Subscales for Children 66-72 Months

FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Movement		Object Movement	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
28	85[b]	31	94[b]	24	96[b]	33	98[b]	30	99	23	98[b]	34	91[b]	23	82[b]
27	58	30	78	23	82	31 - 32	96	29	98	22	89	33	71	22	45
26	31	29	58	22	58	30	92	28	96	21	73	32	49	21	23
25	10	28	45	21	38	29	87	27	93	20	44	31	31	20	15
24	3	27	36	20	26	28	84	26	87	19	18	30	23	19	11
0-23[c]	1	26	25	19	16	27	79	25	77	18	10	29	20	18	9
		25	19	18	8	26	72	24	68	17	8	28	18	17	6
		24	17	17	4	25	66	23	63	16	7	27	14	16	3
		23	13	0-16[c]	1	24	63	22	57	15	5	26	9	0-15[c]	1
		22	10			23	58	21	47	3-14	2	25	7		
		21	7			22	52	20	34	0-2[c]	1	23 - 24	5		
		20	4			21	48	19	20			22	4		
		19	3			20	46	18	14			21	2		
		15 - 18	2			19	41	17	12			0-20[c]	1		
		0-14[c]	1			18	36	15 - 16	10						
						17	32	12-14	8						
						16	22	11	6						
						15	12	10	4						
						14	6	9	3						
						13	2	3-8	2						
						0-12[c]	1	0-2[c]	1						

[b] When the percentile rank for the highest possible score is less than 99, this means that a number of children in this age group achieved the highest possible score. Recall that percentile rank is the percentage of children in the norming sample who scored below the score of interest.

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-8. Percentile Ranks for *LAP-D* Domains for Children 30-35 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
41-59	98	30-57	98	23-53	96	46-57	98
28 – 40	97	26 – 29	97	22	94	35 – 45	97
25 – 27	96	23 – 25	96	21	93	32 – 34	96
24	94	22	94	20	92	31	94
23	93	20 – 21	93	19	91	28 – 30	93
22	90	19	92	18	88	27	91
21	87	18	89	17	84	25 – 26	86
20	84	16 – 17	84	16	80	24	78
19	82	15	78	15	76	23	70
18	75	14	73	14	71	22	61
17	64	13	66	13	63	21	53
16	55	12	56	12	57	20	46
15	44	11	48	11	50	19	38
14	35	10	42	10	46	18	27
13	29	9	38	9	39	17	17
12	21	8	32	8	30	16	11
11	17	7	25	7	24	15	6
10	13	6	18	6	17	14	2
9	9	5	12	5	12	0-13 [c]	1
8	4	4	8	4	9		
0-7 [c]	1	3	4	3	6		
		2	2	2	3		
		0-1 [c]	1	0-1 [c]	1		

[c] Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-9. Percentile Ranks for *LAP-D* Domains for Children 36-41 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
40-59	98	38-57	98	30-53	98	42-57	98
34 – 39	97	32-37	97	26 – 29	96	39 – 41	97
32 – 33	95	29 – 31	96	25	94	37 – 38	96
31	93	28	95	24	91	36	95
30	90	25 – 27	93	23	87	35	92
29	86	24	90	22	80	34	90
28	80	23	86	21	71	32 – 33	88
27	73	22	82	20	61	31	86
26	68	21	79	19	50	30	81
25	61	20	74	18	43	29	77
24	52	19	63	17	39	28	72
23	43	18	50	16	33	27	63
22	35	17	41	15	26	26	53
21	28	16	32	14	20	25	46
20	21	15	23	13	14	24	40
19	16	14	17	12	11	23	33
18	12	13	15	11	10	22	28
17	9	12	12	9 – 10	7	21	24
16	6	11	9	7 - 8	5	20	18
14 – 15	4	9 – 10	6	5 - 6	3	19	14
11 – 13	3	5 - 8	3	0-4 ᶜ	1	18	12
7 – 10	2	3 - 4	2			17	9
0-6 ᶜ	1	0-2 ᶜ	1			16	6
						15	3
						14	2
						0-13 ᶜ	1

ᶜNote that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

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Table C-10. Percentile Ranks for *LAP-D* Domains for Children 42-47 Months

| FINE MOTOR | | COGNITIVE | | LANGUAGE | | GROSS MOTOR | |
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
47-59	99	35-57	99	39-53	99	50-57	99
44 - 46	98	34	98	34 - 38	97	46 - 49	98
42 - 43	97	32 – 33	97	32 - 33	96	45	97
39 - 41	95	31	94	31	94	43 - 44	95
38	92	30	90	30	91	42	93
37	90	29	89	28 - 29	88	41	90
36	86	28	87	27	85	40	87
35	81	27	84	26	83	39	85
34	74	26	79	25	77	38	81
33	66	25	72	24	70	37	75
32	60	24	64	23	61	36	69
31	50	23	53	22	48	35	64
30	41	22	41	21	36	34	58
29	36	21	30	20	25	33	50
28	31	20	21	19	18	32	42
27	25	19	15	18	12	31	38
26	19	18	12	17	9	30	35
25	14	17	10	16	8	29	32
24	7	16	8	13 – 15	6	28	30
23	4	15	5	12	4	27	25
22	3	14	4	11	3	26	18
21	2	12 – 13	3	10	2	25	14
0-20 c	1	11	2	0-9 c	1	23 – 24	10
		0-10 c	1			21 - 22	5
						20	2
						0-19 c	1

cNote that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

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Table C-11. Percentile Ranks for *LAP-D* Domains for Children 48-53 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
53-59	99	45-57	99	50-53	99	53-57	98
49 - 52	98	39 – 44	98	44 - 49	98	50 - 52	97
48	95	38	97	38 - 43	97	49	96
47	93	37	96	37	96	48	95
46	92	36	95	36	95	47	92
45	90	35	92	35	93	46	90
44	87	34	89	34	92	45	85
43	85	33	85	33	91	44	78
42	83	32	76	32	89	43	69
41	79	31	67	31	87	42	60
40	75	30	61	30	84	41	51
39	69	29	55	29	80	40	41
38	64	28	47	28	75	39	31
37	56	27	39	27	70	38	21
36	47	26	31	26	63	37	14
35	41	25	26	25	53	36	11
34	35	24	20	24	44	35	9
33	28	23	14	23	35	34	7
32	23	22	10	22	27	33	6
31	18	21	7	21	23	32	5
30	15	19 - 20	5	20	19	31	4
29	14	18	4	19	13	27 – 30	3
28	11	17	2	18	9	26	2
27	7	0-16 c	1	17	8	0-25 c	1
26	4			16	6		
25	2			15	4		
0-24 c	1			13 – 14	3		
				12	2		
				0-11 c	1		

cNote that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-12. Percentile Ranks for *LAP-D* Domains for Children 54-59 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
57-59	99	46-57	99	45-53	99	55-57	99
56	97	44 - 45	98	44	98	54	98
55	94	43	97	43	97	53	96
54	93	41 - 42	96	42	96	52	93
53	91	40	93	41	95	51	89
52	90	39	91	40	94	50	84
51	89	38	89	39	92	49	77
50	86	37	85	38	90	48	71
49	81	36	80	37	88	47	66
48	78	35	74	36	85	46	57
47	75	34	66	35	82	45	47
46	72	33	55	34	78	44	39
45	68	32	42	33	73	43	28
44	61	31	30	32	68	42	20
43	54	30	21	31	62	41	14
42	46	29	16	30	55	40	8
41	38	28	12	29	49	39	5
40	31	27	10	28	43	38	3
39	24	26	7	27	38	36 – 37	2
38	18	25	4	26	33	0-35 c	1
37	14	24	2	25	26		
36	12	0-23 c	1	24	18		
35	10			23	14		
34	7			22	10		
33	5			21	7		
32	4			20	5		
31	3			19	4		
30	2			18	3		
0-29 c	1			17	2		
				0-16 c	1		

c Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-13. Percentile Ranks for *LAP-D* Domains for Children 60-65 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
58-59	99	53-57	99	52-53	99	57	98
57	98	52	98	50 - 51	98	56	94
56	96	50 - 51	97	49	98	55	87
55	92	49	96	47 - 48	97	54	78
54	86	47 - 48	94	46	95	53	68
53	78	46	92	45	93	52	62
52	70	45	90	44	91	51	56
51	62	44	88	43	87	50	49
50	55	43	86	42	83	49	42
49	47	42	82	41	75	48	36
48	39	41	77	40	66	47	31
47	29	40	72	39	57	46	25
46	21	39	67	38	50	45	19
45	17	38	59	37	45	44	12
44	14	37	50	36	39	43	8
43	11	36	41	35	35	42	4
42	9	35	32	34	32	41	2
41	8	34	23	33	29	0-40 c	1
40	6	33	15	32	26		
39	5	32	8	31	21		
38	3	31	4	30	18		
34 – 37	2	30	2	29	16		
0-33 c	1	0-29 c	1	28	13		
				27	11		
				25 - 26	8		
				24	5		
				23	4		
				22	3		
				21	2		
				0-20 c	1		

c Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-14. Percentile Ranks for *LAP-D* Domains for Children 66-72 Months

FINE MOTOR		COGNITIVE		LANGUAGE		GROSS MOTOR	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
59	97	57	98	52-53	98	57	94
58	90	55 – 56	97	51	97	56	81
57	80	54	95	49 – 50	96	55	66
56	64	53	93	48	93	54	52
55	50	52	91	47	86	53	40
54	38	51	88	46	78	52	32
53	29	50	82	45	71	51	27
52	24	49	77	44	67	50	23
51	20	48	72	43	63	49	19
50	15	47	67	42	54	48	14
49	11	46	63	41	43	47	11
48	9	45	58	40	32	46	10
47	7	44	55	39	23	45	8
46	5	43	52	38	20	44	7
44 – 45	3	42	50	37	18	43	5
41 – 43	2	41	45	36	16	41 – 42	3
0-40 c	1	40	40	35	13	37 – 40 c	2
		39	36	33 – 34	10	0-36 c	1
		38	31	31 – 32	6		
		37	25	29 – 30	4		
		36	19	19 – 28	3		
		35	12	13 – 18	2		
		34	9	0-12 c	1		
		33	7				
		32	5				
		31	4				
		30	3				
		29	2				
		0-28 c	1				

c Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-15. Percentile Ranks for Total *LAP-D* Scores

30-35 MONTHS		36-41 MONTHS		42-47 MONTHS		48-53 MONTHS		54-59 MONTHS		60-65 MONTHS		66-72 MONTHS	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
142-226	98	128-226	98	146-226	99	201-226	99	196-226	99	208-226	99	215-226	98
95-141	97	124-127	96	143-145	98	166-200	98	191-195	98	202-207	98	212	95
94	96	120-123	95	138-142	97	163-165	97	184-190	97	200-201	97	211	93
93	94	114-119	94	137	96	159-162	96	181-183	96	199	96	210	90
92	93	112-113	93	135-136	95	158	95	180	95	196-198	95	209	87
86-91	92	109-111	92	134	94	156-157	94	179	94	195	94	208	84
85	90	107-108	90	133	93	153-155	93	176-178	93	193-194	93	207	80
79-84	88	105-106	89	132	92	152	92	174-175	92	192	92	206	77
77-78	86	102-104	88	131	91	149-151	91	171-173	90	191	90	205	76
74-76	85	100-101	85	129-130	90	148	89	170	89	190	88	204	75
71-73	83	99	82	128	88	147	88	169	88	189	87	203	74
70	81	98	81	127	86	146	86	168	87	188	84	202	73
69	79	97	80	126	85	145	84	167	86	187	83	200-201	70
68	76	96	77	125	84	144	83	166	84	186	81	198-199	66
67	74	95	75	124	82	143	81	165	82	185	80	197	62
66	73	94	73	123	79	142	79	164	81	184	78	196	61
65	70	91-93	69	122	78	141	76	163	79	183	75	195	59
64	67	90	67	121	77	140	73	162	78	182	72	194	57
63	65	89	64	120	75	139	70	161	76	181	69	193	55
62	63	88	61	119	72	138	68	160	74	180	66	192	54
61	60	87	59	117-118	70	137	66	159	71	179	64	191	51
59-60	56	85-86	55	116	67	136	65	158	69	178	62	190	48
58	50	84	50	115	62	135	62	157	68	177	60	189	44
57	46	83	46	114	57	134	59	156	65	176	57	188	41
56	42	82	42	113	55	133	56	155	63	175	54	187	39
55	38	81	39	111-112	53	132	53	154	62	174	50	186	36
53-54	36	80	36	110	51	131	51	153	60	173	48	185	33
51-52	33	79	34	109	49	130	48	152	56	172	46	184	32
50	32	78	31	108	47	129	44	151	52	171	43	183	30
49	30	77	27	107	45	128	42	150	49	170	40	182	28

30-35 MONTHS		36-41 MONTHS		42-47 MONTHS		48-53 MONTHS		54-59 MONTHS		60-65 MONTHS		66-72 MONTHS	
RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK	RAW SCORE	%ile RANK
48	27	74-76	23	106	43	127	40	149	47	169	38	181	26
47	23	73	21	105	41	126	38	148	45	168	35	179-180	24
46	20	72	19	104	38	125	35	147	41	167	33	178	23
44-45	18	71	17	103	36	124	33	146	36	166	30	177	21
43	17	70	15	102	35	123	31	145	32	165	28	175-176	19
41-42	14	69	14	101	33	122	29	144	30	164	26	174	18
40	10	68	11	100	32	121	26	143	28	163	25	173	16
37-39	7	66-67	10	99	30	120	24	142	26	162	24	172	14
36	5	65	8	98	28	119	23	141	25	161	21	171	13
34-35	4	63-64	6	97	27	118	20	139-140	23	160	18	170	11
29-33	2	60-62	5	96	26	117	17	138	21	159	16	169	10
0-28 c	1	56-59	4	95	25	116	16	137	18	158	15	168	8
		55	3	94	23	115	15	136	15	157	14	164-167	6
		25-54	2	92-93	22	114	14	135	14	156	12	162-163	5
		0-24 c	1	91	18	113	12	134	12	154-155	11	160-161	3
				88-90	13	112	11	132-133	11	153	9	152-159	2
				87	11	111	10	129-131	9	151-152	8	0-151 c	1
				86	10	109-110	9	128	7	149-150	7		
				85	8	108	8	127	6	148	6		
				84	7	107	7	124-126	5	146-147	5		
				83	5	101-106	6	123	4	141-145	4		
				82	3	100	5	120-122	3	137-140	3		
				81	2	96-99	4	116-119	2	134-136	2		
				0-80 c	1	94-95	3	0-115 c	1	0-133 c	1		
						91-93	2						
						0-90 c	1						

c Note that the range of raw scores that yields a percentile rank of 1% includes the scores of children from the norm sampling who actually ranked at and below 1%.

Table C-16. Spanish Age Equivalents for *LAP-D* Subscales

FINE MOTOR				COGNITIVE				LANGUAGE				GROSS MOTOR			
Manipulation		Writing		Matching		Counting		Naming		Comprehension		Body Movement		Object Movement	
RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.	RAW SCORE	AGE EQUIV.
28	72	30-31	72	23-24	72	24-33	72	23-30	72	21-23	72	33-34	72	23	72
27	69-72	29	66-72	22	69-72	23	69-72	22	69-72	20	66-72	32	66-72	22	66-72
26	66-68	25-28	63-65	21	63-68	19-22	66-68	21	66-68	19	60-65	31	63-65	21	60-65
25	60-65	23-24	60-62	20	60-62	16-18	54-65	20	63-65	17-18	57-59	30	60-62	20	57-59
24	57-59	19-22	57-59	18-19	57-59	14-15	48-53	17-19	60-62	16	54-56	26-29	54-59	18-19	54-56
22-23	54-56	17-18	54-56	17	54-56	12-13	45-47	13-16	57-59	14-15	51-53	23-25	48-53	17	48-53
21	51-53	16	51-53	15-16	51-53	11	42-44	12	54-56	13	45-50	19-22	45-47	16	45-47
19-20	48-50	14-15	48-50	13-14	48-50	9-10	36-41	11	48-53	12	42-44	17-18	42-44	15	42-44
18	42-47	12-13	45-47	11-12	42-47	7-8	30-35	10	42-47	11	36-41	13-16	36-41	13-14	36-41
16-17	36-41	10-11	42-44	9-10	36-41	0-6	<30	8-9	36-41	6-10	30-35	10-12	30-35	10-12	30-35
9-15	30-35	8-9	36-41	5-8	30-35			4-7	30-35	0-5	<30	0-9	<30	0-9	<30
0-8	<30	6-7	30-35	0-4	<30			0-3	<30						
		0-5	<30												