

**SPANISH LANGUAGE LEARNING  
EXPERIENCES PROJECT:  
SCREEN DEVELOPMENT FINAL REPORT**

**California Department of Social Services**

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**Center for Public Policy Research**

**University of California, Davis**

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# Spanish Language Learning Experiences Project: Screen Development Final Report

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## EXECUTIVE SUMMARY

The Center for Public Policy Research (CPPR) was contracted by the California Department of Social Services (CDSS) to develop a brief, valid measure to screen for learning disabilities (LD) among Spanish-speaking adults enrolled in the California Work Opportunity and Responsibility to Kids (CalWORKs) program. This final report presents a brief literature review, an overview of the project, a description of the methodology, the results of the study, and recommendations for future research.

## METHODOLOGY

### Materials

Three screens were selected as pilot screening measures: the Empire State Screen, a translated version of the Welfare-to-Work (WTW) 18 CalWORKs LD Screen (which is based on the Washington State Screen), and a translated and revised version of the Mississippi Assessment Technique for Identifying Learning Disabilities in Adults (i.e., MATILDA-R). The three pilot screens were selected based on their statistical properties (as reported by each screen's developers<sup>1</sup>) and

their ease of administration, scoring, and interpretation. The three pilot screens were administered to each participant.

### Participant Characteristics

As part of the screen development, 1,107 low-income, Spanish-speaking adults residing in California were tested. For the final report, valid data for 1,040 participants (884 females, 156 males) were available for analysis.

Participants were from low-income families (average household monthly income was \$851), had low educational attainment (average highest level of schooling was 8<sup>th</sup> grade), and spoke relatively little English (81% indicated that they did not speak/write well in English). The majority (97%) of the participants were born outside of the U. S., primarily in Mexico (89%). More than half (59%) of the participants were receiving some form of public assistance, and most (72%) were not employed at the time of participation. Participants were recruited from various agencies that provide services to low-income individuals (e.g., welfare offices, community clinics) in 13 California counties.

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<sup>1</sup> In the case of the WTW 18, the statistical properties used as the basis for selection were those reported in the development of the English

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version of the Washington State Screen (see DSHS, 1998).

## LD Status Determination

To determine the LD status of the participants, three methods were employed for each participant. The first method was a diagnosis based on discrepancy scores derived from a standardized measure of ability and achievement developed for Spanish speakers, namely the Bateria III. Based on the Bateria III guidelines, a statistically significant discrepancy between an individual's ability and achievement is considered to be indicative of LD. This method is consistent with the criteria established by the American Psychiatric Association (APA) in the 4<sup>th</sup> edition of the *Diagnostic and Statistical Manual* (DSM-4). We refer to this method as the Bateria Discrepancy Diagnosis (BDD; see Methods section).

The second ("pattern of strengths and weaknesses" [PSW]) and third (DSM-5) methods for determining LD were based on diagnoses obtained from a clinical LD specialist. Two clinical methods were employed to determine LD status because, during the course of this project, the APA substantially revised the criteria used to clinically diagnose LD. The earlier edition of the DSM (DSM-4) required that an individual show a statistically significant discrepancy between ability and achievement on at least one standardized test of IQ as a primary criterion for an LD diagnosis. The most recent DSM edition

(DSM-5) requires that an individual demonstrate a childhood history of learning problems (in addition to a discrepancy between ability and achievement) for a diagnosis of LD. In response to the change in criteria, the clinical specialist working with CPPR provided a diagnosis for each participant using both the PSW clinical approach (which, in part, utilizes the DSM-4 criteria to assess LD) and the DSM-5 clinical approach, based on the most recent APA criteria (see Methods section).

All three methods for determining the LD status of participants were utilized to examine the predictive utility of each of the pilot screens.

## RESULTS

Predictive models were developed and a series of logistic regressions were used to predict each case of LD from the scores and diagnoses available from each screening measure. Additionally, each screen's level of overall accuracy,<sup>2</sup> sensitivity (ability to correctly identify individuals as learning disabled), and specificity (ability to correctly screen out individuals who are not learning disabled) were examined.

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<sup>2</sup> Overall accuracy refers to the percentage of all correctly identified LD classifications (LD and not LD).

## Empire State Screen

Statistically, the Empire State Screen was significantly correlated with the BDD, the PSW, and the DSM-5. In terms of the BDD, the Empire State had an accuracy of 71%, a sensitivity of 50%, and a specificity of 77%. With respect to the PSW, the Empire State Screen had an accuracy of 69%, a sensitivity of 45%, and a specificity of 74%. Finally, with respect to the DSM-5, the Empire State Screen had an accuracy of 71%, a sensitivity of 50%, and a specificity of 73%. See “Summary of Results” table presented at the end of the Executive Summary.

## WTW 18 Screen

The results from the WTW 18 Screen showed that it was a statistically significant predictor of LD based on the BDD, the DSM-5, and to a lesser extent the PSW, but had either poor sensitivity or specificity depending on the scoring method used to examine the screen’s utility. The exception is the screen’s predictive utility with respect to the DSM-5. When participants’ total raw (unweighted) score was used in the analyses, the WTW 18 Screen had an accuracy of 69%, a sensitivity of 73%, and a specificity of 68% in predicting the DSM-5 diagnosis. See “Summary of Results” table.

## MATILDA-R

Results showed that the MATILDA-R was a

statistically significant predictor of LD when compared with the following diagnostic criteria: BDD, the PSW, and the DSM-5. Overall, when the LD status was based on the BDD, the MATILDA-R had an accuracy of 71%, a sensitivity of 66%, and a specificity of 72%. These values were 69% (accuracy), 65% (sensitivity), and 69% (specificity) when using the PSW method and 67% (accuracy), 63% (sensitivity), and 67% (specificity) when using the DSM-5 criteria. See “Summary of Results” table.

## CONSIDERATIONS AND RECOMMENDATIONS

The goal of this project was to develop a brief screen to be used by CalWORKs staff to determine if a client should be referred for a more complete assessment of a possible LD. Several issues must be considered in determining which screen to recommend and use in the field. These issues center around the diagnostic method utilized to determine LD status by clinicians, the desired balance between the screen’s sensitivity and specificity, and the practicality of utilizing the screen in work settings. In the Discussion section, we address some of these concerns.

Based on our findings, we can recommend two of the three screens as options for adoption by CDSS: the translated WTW 18 Screen and the

MATILDA-R. We cannot recommend the Empire State Screen, primarily because of its low sensitivity (i.e., ability to correctly identify an individual as learning disabled as determined by the three methods of determining LD).

The choice between the translated WTW 18 Screen and the MATILDA-R should take into account the changing diagnostic practices of the LD field as a consequence of the changes in diagnostic criteria delineated in the most recent edition of the DSM. The MATILDA-R demonstrated modest overall accuracy and sensitivity and could thus be considered for adoption, particularly if the PSW clinical approach will be the most commonly used method to assess individuals for LD, because the results indicated that the MATILDA-R was the best overall predictor of PSW diagnoses. However, with the criteria for diagnosing LD transitioning from the DSM-4 to the DSM-5, the

translated WTW 18 Screen may be preferred as the results indicated that it is the better predictor of DSM-5 diagnoses.

We recommend that CDSS investigate the clinical approach for determining LD status that will be most commonly used by clinicians who work with CalWORKs recipients. This will be an important factor in deciding which screen to choose as the screens differ in accuracy depending on the clinical method used to determine LD.

Although the two recommended screens may be adequate for screening Spanish-speaking adults for LD risk, it is possible that refining of the recommended screens (e.g., changes in the wording of some items, giving some items more weight) could improve their overall accuracy and precision. We offer specific suggestions for improvements and for further research.

## Summary of Results:

### Screen Accuracy, Sensitivity, and Specificity Rates as a Function of Diagnostic Method<sup>1</sup>

<b>Empire State Screen</b>	<b>Accuracy<sup>2</sup></b>	<b>Sensitivity<sup>3</sup></b>	<b>Specificity<sup>4</sup></b>
BDD <sup>5</sup> Diagnostic Method	71%	50%	77%
PSW <sup>6</sup> Diagnostic Method	69%	45%	74%
DSM-5 <sup>7</sup> Diagnostic Method	71%	50%	73%
<b>WTW 18 Screen</b>	<b>Accuracy</b>	<b>Sensitivity</b>	<b>Specificity</b>
BDD Diagnostic Method	75%	27%	89%
PSW Diagnostic Method	----	----	----
DSM-5 Diagnostic Method	69%	73%	68%
<b>MATILDA-R Screen</b>	<b>Accuracy</b>	<b>Sensitivity</b>	<b>Specificity</b>
BDD Diagnostic Method	71%	66%	72%
PSW Diagnostic Method	69%	65%	69%
DSM-5 Diagnostic Method	67%	63%	67%

<sup>1</sup> See Tables 9 through 11 for complete details

<sup>2</sup> Accuracy is defined as the percentage of correct LD and non-LD classifications

<sup>3</sup> Sensitivity refers to each screen's ability to correctly identify individuals as having LD who have been determined to have LD by each of the three diagnostic methods

<sup>4</sup> Specificity refers to the each screen's ability to correctly reject (screen out) individuals as not having LD who have been identified as not having LD by each of the three diagnostic methods

<sup>5</sup> BDD = Bateria Discrepancy Diagnosis

<sup>6</sup> PSW = Pattern of Strengths and Weaknesses

<sup>7</sup> DSM-5 = Diagnostic and Statistical Manual, 5<sup>th</sup> Edition

<sup>8</sup> The statistical association was too low to permit reasonable calculation of rates

# PURPOSE AND BACKGROUND

## PURPOSE

This project was conducted to develop a short, valid measure to screen for learning disability (LD) among Spanish-speaking adult applicants enrolled in the California Work Opportunity and Responsibility to Kids (CalWORKs) program, which is a welfare program that provides cash aid and services to eligible needy California families. CalWORKs is the California version of the Temporary Assistance for Needy Families (TANF) program. The project was commissioned by the California Department of Social Services (CDSS) to improve the identification of Spanish-speaking CalWORKs recipients who might benefit from a full LD evaluation and services related to LD.

## BACKGROUND

### Learning Disabilities

#### Definition and Prevalence

One of the most commonly used definitions of LD is that of the National Joint Committee on Learning Disabilities (1994), which states that LD is “a general term that refers to a heterogeneous group of disorders manifested by major difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span” (p. 16). LD is considered a lifelong condition, which begins in childhood and persists into adulthood. LD may manifest itself as a deficit in one or more areas of functioning, including attention, reasoning, processing, memory, communication, reading, writing, spelling, calculation, coordination, social competence, and emotional maturity. It is thought that deficits in these areas of functioning may have adverse consequences for various areas of daily functioning, including academic performance and employment (Gerber, 2012; Morris, Schraufnagel, Chudnow, & Weinberg, 2009; Raskind, Goldberg, & Higgins, 1999; U.S. Department of Education, 2005).

Estimates of the prevalence of LD among adults in the U.S. vary widely from 2% to more than 50% depending on which segment of the population is being studied (e.g., adult education students, general population), the age range (e.g., young adults, older adults), and the method employed to determine the

prevalence rate (e.g., self-report, survey of Adult Based Education [ABE] instructors: Corely & Taymans, 2003; Cortiella, 2011; U.S. Department of Labor, 1991; see Gerber, 2012, for review).

The prevalence of LD among recipients of TANF, however, may be significantly<sup>3</sup> higher than the prevalence among those in the general population. For instance, Giovengo, Moore, and Young (1998) found that 36% of TANF clients were diagnosed as having LD. Similarly, Goldberg (2002) reported that 25% to 33% of welfare-to-work participants were considered to be LD. Others have provided estimates ranging from 20% to as high as 60% (Burgstahler, 2003; Young & Browning, 2005). Indeed, it has been suggested that LD is one of most frequently cited types of impairments among TANF clients (see Kusserow, 1992). After an extensive review of the literature, we found that estimates of LD among non-English speaking adults in the U.S., and specifically Spanish speakers, are currently unavailable. The present project provides a first estimate of LD among low-income Spanish-speaking adults.

## Outcomes

Functional outcomes among individuals with LD can vary greatly, ranging from highly successful individuals to those who are dependent on others for daily living (Gerber & Reiff, 1991). Furthermore, levels of general intelligence among individuals with LD can vary from borderline, or low average, intelligence to superior intelligence (Shaywitz, Morris, & Shaywitz, 2008). Adding to the complexity in understanding LD is the paucity of information about the functional outcomes associated with LD among minorities and among non-English speaking adults in the U.S. Nevertheless, LD has been found to occur in various cultures and economic groups (Jimenez & Garcia, 2007; Paulesu et al., 2001; Sideridis, 2007; Taymans, 2012).

Although outcomes for individuals with LD can be quite varied (Gerber, 2012), research suggests that individuals with LD may struggle to successfully navigate important adult roles and responsibilities, such as the successful completion of basic education and the attainment of adequate employment. For instance, individuals with LD have high school drop-out rates that are 2 to 3 times higher than that for their peers (U.S. Department of Education, 2008; U.S. General Accounting Office, 2003; Young & Browning, 2005) and are less likely to enroll in college than individuals in the general population (Gregg, 2007; Stodden, Jones, & Chang, 2002; Wagner, Newman, Cameto, Garza, & Levine, 2005; Young &

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<sup>3</sup> In this report, the term “significant” is used to refer to statistical significance. Statistical significance denotes the low probability (usually less than .05) that an observed effect would have occurred due to chance.

Browning, 2005). Although persons with LD attend vocational and other non-college postsecondary training programs at higher rates than their non-LD peers, those with LD tend to complete these programs at low rates (Murray, Goldstein, Nourse, & Edgar, 2000).

With respect to employment, Reder and Vogel (1997) found that persons with self-reported LD were less likely to be employed full-time and more likely to be unemployed than those who did not report LD (see also Haring, Lovett, & Smith, 1990). Moreover, individuals who self-reported as LD worked significantly fewer weeks per year, for lower wages, and in more service/labor related jobs than those in the non-LD group (see also Levin & Edgar, 1994). Reder (1995) also reported that 42% of families of adults who self-reported LD were living in or near poverty, compared with only 16% of their non-LD peers. When employed, individuals with LD often find themselves in low-wage jobs with little opportunity for advancement and often without health insurance and other benefits (Blackorby & Wagner, 1997; Edgar, 1995; but see the following articles for findings that differ: Reiff, Gerber, & Ginsberg, 1997; Seo, Abbott, & Hawkins, 2008; Werner, 1993). In a follow-up sample of individuals with LD, Seo and colleagues (2008) established that young adults (age 21 years) with LD utilized more public aid (e.g., food stamps, supplemental security income, and unemployment compensation) than their non-LD peers. No difference between groups, however, was uncovered in the utilization of public assistance at age 24 years. In a similar study, it was revealed that female youth with LD had higher rates of child bearing and public assistance usage than female youth without LD (Murray, Goldstein, & Edgar, 1997).

Overall, research suggests that many individuals with LD face challenges meeting the demanding roles and responsibilities of adulthood, including employment. Appropriate instructional methods, programs, and accommodations may increase the probability of successful adult outcomes among LD individuals (Gerber, 2012; Hock, 2012; Shapiro & Rich, 1999; Taymans, 2009). It is with these issues in mind that researchers and practitioners are actively investigating instructional methods and interventions to assist persons with LD (for review, see Corely & Taymans, 2003; Gregg, 2011; Hock, 2012).

## Identifying Individuals with LD

To provide appropriate assistance, individuals with LD must first be identified. For many young adults in the U.S., identification of LD may occur during the school-age period. Still, not all individuals with LD are correctly identified during childhood (e.g., International Dyslexia Association, 2007; Miles 2004; Shaywitz, 2003), and those born and schooled in developing countries (where LD may not even be recognized) may

never have an opportunity to be identified as having LD. Thus, there may be a substantial minority of individuals in the U.S. with LD who have not been identified and whose needs are not being recognized and potentially addressed.

Although there are no federal regulations regarding the assessment procedures required to identify adults with LD, assessment generally involves the examination of patterns of strengths and weaknesses in performance and/or achievement relative to age, as reflected across various tests, such as standardized tests of ability and achievement, and questionnaires of functioning (for reviews see Gregg, Coleman, Davis, Lindstrom, & Hartwig, 2006; Taymans, 2012). Historically, a key concept in making a diagnosis of LD is the discrepancy between intellectual potential (ability) and academic performance (achievement; e.g., Gregg, Scott, McPeck, & Ferri, 1999; Seo et al., 2008). The Individuals with Disabilities Education Act (IDEA, 2004, Public Law 101-476) states that the unexpected underachievement often observed among individuals with LD has been documented as a discrepancy between IQ scores and lower-than-expected scores on achievement testing (or discrepancies between ability and achievement subscales). The IQ/achievement discrepancy, for instance, is part of the LD identification process for vocational rehabilitation services (U.S. Department of Education, 2005). Research on individuals with LD often includes standardized measures of intelligence and achievement (e.g., Wechsler Intelligence Scale for Children, Stanford-Binet, Woodcock-Johnson Tests of Cognitive Abilities) as part of the assessment procedure (e.g., Holliday, Koller, & Thomas, 1999; Morris et al., 2009; Seo et al., 2008).

In addition to the pattern of profiles on standardized tests, a key factor in the accurate assessment of LD involves the judgment of a trained clinician (National Joint Commission on Learning Disabilities, 1997), who considers the environmental, biological, cognitive, language, and behavioral factors influencing an individual's ability to learn tasks in a specific context (Brackett & McPherson, 2006; Hoy, Gregg, Wisenbaker, Bonham, King, & Moreland, 1996). Examples of these factors include: the fit between the learner and the instructional environment, the primary language of the learner and the instructional language, the intrusion of behavioral disorders that obstruct learning and physical illness or well-being that impact the learner's availability for learning. Overall, when determining the presence of a learning disability, clinicians must consider the interaction of multiple factors that impede learning, foster learning, or mitigate the influence of those factors that impede learning. Clinicians would consider, for example, that individuals with similar cognitive profiles may have different levels of academic success

due to factors such as supportive environments, behavioral characteristics, and personality traits. Gregg and colleagues (2006) argue that a balance between statistical data (as provided by standardized measures) and clinical judgment is needed to assess LD.

It is important to note that, during the course of this project, the American Psychiatric Association (APA) revised the criteria for determining LD, as delineated in the *Diagnostic and Statistical Manual of Mental Disorders*, 5<sup>th</sup> edition (DSM-5; 2013). The new criteria place less emphasis on discrepancies in IQ/Achievement than did the previous version (i.e., DSM-4) and require evidence of a childhood history of LD. To address the change in criteria established by the 5<sup>th</sup> edition of the DSM, both the DSM-4 and DSM-5 criteria were used in the present project to determine the clinical LD status of participants and evaluate the pilot LD screens.

## Screening for LD

Screening individuals for LD is a critical first step in providing assistance and/or accommodations to help persons with LD successfully attain more positive outcomes in adulthood. Various states throughout the U.S. have moved forward in the development of screening measures to identify individuals who may benefit from additional assistance (NGA Center, 1998). LD screening is a preliminary, systematic procedure that identifies characteristics or signs of LD. It can serve as a first step in the process of obtaining a more complete assessment that can include interviews, observations, surveys, and neuropsychological testing by a qualified professional (National Adult Literacy and Learning Disabilities Center, 1999).

There is, however, a great need for the development of screening and assessment procedures for non-English speaking individuals. In California, for instance, approximately 51% of all persons served by the CDSS are Hispanic. Even so, valid screening measures for Spanish-speaking adults in California with LD are not available. It is thus critical that a screening measure be developed to help identify Spanish-speaking adults for LD in California. To this end, the Center for Public Policy Research (CPPR), at the University of California, Davis, was contracted by CDSS to develop a short, valid, screening measure for Spanish-speaking adult applicants in the CalWORKs program to identify those at risk for LD. The following section provides a brief overview of the project design.

## **PROJECT DESIGN OVERVIEW**

This project involved the administration and evaluation of three pilot screens (i.e., brief tests) that were either originally developed in Spanish or translated into Spanish for this project. To determine the LD status of participants, two standardized IQ assessments were also administered, specifically the Bateria III (a Spanish version of the Woodcock-Johnson Tests of Cognitive Abilities) and the Test of Nonverbal Intelligence, 4<sup>th</sup> edition (TONI-4). From these two assessments, LD diagnoses were derived. The sample population included approximately 1,000 Spanish-speaking, low-income adults, residing in California. Recruitment of participants for the project focused on creating a sample that closely matched the demographic characteristics of the CalWORKs population and that was likely to meet CalWORKs eligibility requirements.

### **PILOT SCREENS**

Three existing screens were selected as pilot screens to be tested and evaluated: the Empire State Screen, the Welfare-to-Work (WTW) 18 CalWORKs LD Screen, and a revised version of the Mississippi Assessment Technique for Identifying Learning Disabilities in Adults (MATILDA-R). The screens were selected based on their statistical properties (as reported by each screen's developers) and their brevity and ease of administration, scoring, and interpretation. The "Methods" section provides information regarding the scoring procedures and reported properties of each screen.

### **ASSESSMENTS OF LD STATUS**

To assess the LD status of individuals, the Bateria III was utilized to obtain a profile of the participants' pattern of strengths and weaknesses as indicated by discrepancies among several ability and achievement subscales.

The TONI-4 was also included as an additional measure of general intelligence. Measures of general intelligence tend to rely heavily on language ability. It was expected that participants in the target population would primarily consist of individuals with low academic achievement (including lower levels of language attainment). Because of the concern that an assessment that relies heavily on language would underestimate participants' intellectual ability, a non-verbal measure of intelligence was deemed

necessary. The “Methods” section provides information regarding the structure and function of the Bateria III and TONI-4.

In addition to these standardized measures, an LD clinical specialist provided a diagnosis for each of the participants based on information provided by CPPR, including the results from the Bateria III and TONI-4, as well as demographic information gathered as part of this project’s eligibility enrollment process.

# METHODS

## PARTICIPANTS

For the current project, 1,107 Spanish-speaking adults were tested. Data for 1,040 participants were available for analysis (156 males and 884 females).<sup>4</sup> The average age of participants was 36 years, with a range of 19 to 66 years. Approximately half (54%) of the participants were married, with an average of 2.83 children per household. The average household income was \$851 per month, and participants completed an average of 8.82 years of schooling (approximately 8th grade). The majority (97%) of participants were born outside of the U. S. Most participants (98%) completed at least some of their schooling in their native country (average 8.17 years), and most (81%) indicated that they did not speak or write well in English. The majority of the participants resided in Sacramento (40%) and Yolo counties (22%) at the time of their participation, and indicated their birth place as Mexico (89%). More than half (59%) of the participants reported they were receiving some form of public assistance (e.g., CalFresh [formerly the Food Stamp program], Women, Infants, and Children program, Section 8 housing), and most (72%) were not employed at the time of participation.

Table 1 (page 21) provides means and standard deviations (SDs) on basic demographic information, and Table 2 (page 22) provides descriptive information regarding participants' educational background, income, current work status, and whether the participant was receiving public assistance at the time of testing.

All procedures were conducted in accordance with the American Psychological Association guidelines and approved by the university's Institutional Review Board. Participants provided written informed consent, and each received a \$150 gift card for participating.

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<sup>4</sup> Data for 67 participants were not included for the following reasons: significant disruptions during testing (e.g., distracting environmental noise), participant illness during testing, incomplete tests, errors in testing administration, and participants who (after testing) were found not to meet eligibility criteria. Additionally, pilot participants ( $n = 16$ ) were not included in the analyses.

**Table 1****Basic Demographic Characteristics (N = 1,040)**

<b>Gender</b>	Females = 884	Males = 156
<b>Age</b>	Mean = 36.36 ( $SD^1 = 8.34$ )	Range = 19 years to 66 years
<b>Marital Status</b>	Married = 562 Living with companion = 187 Divorced = 35	Single = 138 Separated = 104 Widowed = 14
<b>Birth Place</b>	Mexico = 923 Central America <sup>2</sup> = 71 Cuba/Puerto Rico = 3	USA = 31 South America <sup>3</sup> = 12
<b>Years in U.S.</b>	Mean = 13.76 years ( $SD = 8.00$ )	Range = 11 months to 47 years
<b>Number of Children</b>	Mean = 2.83 ( $SD = 1.32$ )	Range = 0 (but expecting) to 11 children
<b>Family Unit Size</b>	Mean = 4.43 ( $SD = 1.44$ )	Range = 1 to 15 family members
<b>Speak/Write Spanish</b> <sup>4</sup>	Mean = 1.49 ( $SD = .55$ )	Range = 1 to 3
<b>Speak/Write English</b> <sup>4</sup>	Mean = 3.00 ( $SD = .62$ )	Range = 1 to 4
<b>County of Residence</b>	Contra Costa = 2 Lake = 6 Mendocino = 2 Napa = 37 Sacramento = 421 Stanislaus = 14 Yuba = 3	El Dorado = 9 Los Angeles = 82 Merced = 38 Placer = 1 Solano = 195 Yolo = 230

**Notes:**

<sup>1</sup>  $SD$  = Standard Deviation; Standard deviations show how much variation exists from the mean. A low standard deviation indicates that the data points tend to be very close to the mean. In contrast, a high standard deviation indicates that the data points are spread out over a large range of values.

<sup>2</sup> This category includes those who were born in Guatemala, El Salvador, Honduras, or Nicaragua.

<sup>3</sup> This category includes those who were born in Chile, Columbia, Peru, Paraguay, or Venezuela.

<sup>4</sup> 1 = very well; 2 = well; 3 = not very well; 4 = not at all or very little

## Table 2

### *Education, Income, and Work Characteristics (N = 1,040)*

<b>Years in School</b>	Mean = 8.82 years ( $SD^1 = 3.35$ )	Range = 0 years (no school) to 20 years
<b>Years of Schooling in Latin America<sup>2</sup></b>	Mean = 8.17 years ( $SD = 3.36$ )	Range = 0 years to 20 years
<b>Highest School Level Achieved<sup>3</sup></b>	Mean = 8th grade	Range = 0 to university level
	No schooling = 6 Secondary school = 608	Primary school = 321 Post-secondary = 105
<b>Family Income (Monthly)</b>	Mean = \$851.19 ( $SD = 567.83$ )	Range = \$0 to \$2,110 per month
<b>Public Assistance</b>	No = 398 Unknown = 28	Yes = 614
<b>Currently Working</b>	Not working = 752	Currently working = 288

#### Notes:

<sup>1</sup>  $SD$  = Standard Deviation

<sup>2</sup> The majority of participants (98%) completed at least some of their education in Latin America, including most (90%) of those born in the U. S.

<sup>3</sup> Primary school = 1<sup>st</sup> to 6<sup>th</sup> grade; Secondary school = 7<sup>th</sup> to 12<sup>th</sup> grade; Post-secondary = some college to college degree (i.e., BA/BS, MA/MS)

## **MATERIALS**

All materials used in this research were either originally developed for Spanish-speakers or translated into Spanish for the purpose of this project. Materials included a demographic questionnaire to determine eligibility for enrollment and to obtain background information, three pilot screening measures (i.e., Empire State Screen, WTW 18 CalWORKs LD Screen, and MATILDA-R), and two standardized measures of general intellectual ability (Bateria III and TONI-4).

### **Demographic (Eligibility) Questionnaire**

A demographic questionnaire was developed to obtain background information, as well as to determine participant eligibility. Background questions included, for example, date of birth, place of birth, marital status, highest level of education, and number of children (see Appendix A and B, English-back translation and Spanish version, respectively). Eligibility was determined by participants' responses to questions that assessed whether they met the following eligibility requirements: 1) Must be age 18 years or older; 2) Must have at least one child or be currently pregnant; 3) If married/cohabitating, partner must be unemployed or work less than 100 hours/month; 4) Must be a renter (does not own home); 5) Spanish must be the native/dominant language; and 6) Must meet income requirement (see income eligibility chart, Appendix C).

### **Pilot Screens**

#### **Empire State Screen**

The Empire State Screen was developed by Dr. David Abwender (2005) at the State University of New York at Brockport. The screen is a composite of 11 items selected from four candidate screening measures. The 11 items were selected from the four candidate screens on the basis of their statistical diagnostic utility. Because the screen could not differentially diagnose LD, mental retardation, and marginal intellectual function (i.e., borderline mental retardation), the final screen was more accurately described as a measure identifying "learning needs" as opposed to a measure of LD specifically. The questions were written in Spanish and tested on adult Spanish-speaking, low-income participants in the original Empire Screen study conducted by Dr. Abwender.

To ensure the accuracy and appropriateness of the translated screen, CPPR conducted a focus group of Spanish-speaking participants,<sup>5</sup> prior to the commencement of the project, for review and feedback. Changes to the language of the screen, based on feedback from the focus group, were made as necessary in consultation with CDSS.

The Empire State Screen is comprised of 11 “yes/no” statements concerning various learning-related problems (Section 2, Appendices D and E, Spanish version and English-back translation, respectively). Each statement has a certain point value (weighted value) associated with it. For scoring purposes, participant responses are summed and a constant value (i.e., 614) is subtracted from the sum. Scores above 50 are considered to reflect the presence of learning needs. According to Abwender (2005), the Empire State Screen exhibited an 83% overall diagnostic accuracy (83% sensitivity,<sup>6</sup> 84% specificity<sup>7</sup>) for identifying persons with “learning needs.”

## **WTW-18**

The WTW 18 is based on the Washington State Screen, which was developed by Dr. Nancie Payne (Payne & Associates) in collaboration with the Washington State Department of Social and Health Services (DSHS, 1998). The screen consists of 13 “yes/no” questions regarding various learning-related problems (see Sections 1-4 of the WTW 18, Appendices F and G, English and Spanish versions, respectively). These 13 questions are divided into four sections, with each section differentially weighted (e.g., the score for Section 1 is multiplied by 1, the score for Section 2 is multiplied by 2). The screen was developed for English-speakers and translated into Spanish by CDSS. To ensure the accuracy and appropriateness of the translated screen, it was presented to a focus group of Spanish-speaking adults for review and the screen was revised accordingly by CDSS.

Scores at or above 12 are considered to reflect a high risk of LD. According to the DSHS report (1998), the Washington State Screen has an overall diagnostic accuracy of 74% (70% sensitivity, 79% specificity). In this project, we used the scoring guidelines developed for the Washington State Screen in administering and evaluating the translated WTW 18.

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<sup>5</sup> Focus group participants were asked to review study materials (i.e., consent forms, demographic questionnaire, and screens) for language accuracy and clarity. Participants in the focus groups were required to be native Spanish speakers.

<sup>6</sup> Sensitivity refers to the screen’s ability to correctly identify individuals as LD as determined by the criteria employed (separately for each of the three methods of diagnosis—BDD, PSW, and DSM-5).

<sup>7</sup> Specificity refers to the screen’s ability to correctly reject (screen out) individuals as not LD as determined by the criteria employed.

## Mississippi Assessment Technique for Identifying Learning Disabilities in Adults - Revised (MATILDA-R)<sup>8</sup>

The MATILDA was developed at the University of Southern Mississippi by Dr. Robert Grubb and colleagues (Grubb, Hemby, Walker, & Pierce, 1996) and consists of both “yes/no” questions and several tasks that the participant is asked to complete (e.g., writing the alphabet and numbers 1-20, completing a set of math problems: see Appendices H and I, modified English and Spanish versions, respectively). Scores at or above 13 suggest a risk of LD (see MATILDA scoring guidelines; Grubb, Hemby, Walker, & Pierce, 2001).

Because the MATILDA was developed for use with college-level, English-speaking students, the MATILDA screen was revised (hereafter referred to as the MATILDA-R)<sup>8</sup> for the current project to better reflect the educational level, language, and culture of the target population (i.e., low socioeconomic status, Spanish-speaking adults). Similar to the original MATILDA, the MATILDA-R consists of six sections (see Appendices H and I, English and Spanish versions, respectively). Modifications to the MATILDA include changes to instructions (e.g., “write the Spanish alphabet” in Section II), addition of an example to Section III, shortening the paragraph participants are required to copy, changing protagonist names to be more culturally representative (Section V), and simplifying the math problems in Section VI. Finally, the screen was translated into Spanish. To ensure the accuracy and appropriateness of the translated screen, the screen was presented to a focus group of Spanish-speaking participants for review and feedback. Changes to the screen, based on the feedback provided by the focus group, were made as necessary. Because of the changes made to the original MATILDA, the psychometric properties of the MATILDA-R were unknown but were assessed as part of the current project (see Results section).

## Assessments of LD Status

To determine the LD status of participants, and the accuracy and predictive utility of the screens, participants were administered two standardized assessments, the Bateria III and the TONI-4, which provide a measure of general intellectual ability. Tests of intellectual ability and achievement are a core component of the assessment of LD. In addition to these standardized measures, two clinical diagnoses were also obtained for each participant from a clinical LD specialist.

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<sup>8</sup> The MATILDA is a copyrighted screen. Permission to revise, translate, and utilize the modified screen in this project was obtained from Dr. Robert Grubb.

## Bateria III

The Bateria III consists of a comprehensive set of tests that measures both cognitive abilities and achievement levels. It was developed for Spanish-speaking individuals between the ages of 2 years and 90+ years. Most of the Bateria III tests show strong reliabilities<sup>9</sup> of .80 or higher; several are .90 or higher. The Bateria III interpretive plan is based on cluster (grouped items) interpretation. The Bateria III clusters show strong reliabilities, most at .90 or higher.

In addition to a measure of general ability and achievement, the Bateria III also provides two major types of discrepancy measures: ability/achievement discrepancies and intra-achievement discrepancies. The ability/achievement discrepancy is the most commonly used method of evaluating an individual's eligibility for special programs. Generally, a 15-point difference between the cognitive subscales and the achievement subscales indicates LD. Information gathered from intra-ability discrepancies helps professionals to determine an individual's strengths and weaknesses, diagnose and document language and learning disabilities, and plan intervention strategies.

## TONI-4

Because of the characteristics of our target population (e.g., low-income, immigrant, non-English speakers), it was deemed essential that a non-verbal measure of intellectual ability be administered. This was necessary to assess whether our primary measure of intellectual ability and achievement, the Bateria III, conflated participants' intellectual ability with their likely low levels of language attainment. Convergence in the estimates of intellectual ability between the Bateria III and the TONI-4 would suggest that the Bateria III (despite its greater reliance on language) provides a relatively accurate representation of participants' intellectual ability.

The TONI-4 is an individually (versus group) administered instrument that uses abstract reasoning and figural problem solving to estimate general intellectual ability. It measures general cognitive ability without allowing poor language, poor motor skills, or lack of cultural knowledge to conceal an individual's intelligence. Moreover, the TONI-4 is designed to be used with individuals who may have language, hearing, or motor deficiencies, including individuals who may be unfamiliar with the conventional American culture. The TONI-4 instructions can be given to the participant either verbally or

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<sup>9</sup> Reliability (specifically, test-retest reliability) refers to the overall consistency of a measure. A measure is said to have a high reliability if it produces similar results under consistent conditions.

nonverbally. The TONI-4 demonstrates strong reliabilities of .90 or higher.

## LD STATUS DETERMINATION

### Change in Criteria for LD Clinical Diagnosis

During the latter half of the project, the APA released a revised edition of the DSM. The new edition (DSM-5) substantially changed the classification criteria for determining LD. Included in the changes introduced by the DSM-5 is a change in category, from “Learning Disability” to “Specific Learning Disorder” or SLD. The new criteria place less emphasis on discrepancies in IQ/Achievement than the previous version (i.e., DSM-4) and require evidence of a childhood history of LD (see Tables 3 and 4 for comparison between DSM-4 and DSM-5).

### Table 3

#### *Learning Disability (LD): DSM-4 Criteria*

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##### Criteria

- A. The individual’s achievement on individually administered, standardized tests in reading, mathematics, or written expression are substantially below that expected for age, schooling, and level of intelligence.
  - B. The learning problems in Criterion A significantly interfere with academic achievement or activities of daily living.
  - C. If a sensory deficit (e.g., blindness) is present, the difficulties in the particular skill area (e.g., reading, writing, math) must be in excess of those usually associated with the deficit.
-

## Table 4

### *Specific Learning Disorder (SLD): DSM-5 Criteria*

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- A. Difficulties learning and using academic skills persisting for at least 6 months.
  - B. The affected academic skills are substantially and quantifiably below those expected for the individual's chronological age and cause significant interference with academic or occupational performance.
  - C. The learning difficulties begin during school-age years.
  - D. The learning difficulties are not better accounted for by intellectual disabilities or other disorders, language, or inadequate education.
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The choice regarding the most appropriate screen might depend on the diagnostic procedures used in the field as clinicians transition from the DSM-4 criteria to the DSM-5 criteria. To address the change in diagnostic criteria and determine each screen's capacity to predict participants' LD status when utilizing current clinical methods and the new clinical standard (DSM-5), the project's LD specialist was asked to provide a diagnosis, for each participant, using both the standard PSW method as well as the new DSM-5 method.

## How LD Status was Determined

Three methods were used to determine each participant's actual LD status: 1) Discrepancy scores derived from the Bateria III results and consistent with DSM-4 criteria; 2) Clinical interview approach (pattern of strength and weaknesses); and 3) DSM-5 criteria.

### Bateria Discrepancy Scores

Software developed by the publishers of the Bateria III computes various scores, including discrepancy scores that are considered to be indicative of LD. This discrepancy method compares the predicted score (based on the participant's performance on the cognitive portion of the test battery) to the obtained score on the achievement portion of the test battery. A differential score is derived by subtracting the obtained score from the predicted score. That difference score is then compared to the difference score of all others in the norm group. If the difference is more than 1.5 standard deviations from the mean, the discrepancy is considered significant and thus evidence of LD. This discrepancy approach follows from procedures that have been commonly used in the LD field and was the primary criteria in the DSM-4 (see Table 3).

### Clinical Diagnosis

After all measures were scored and entered into a database, the clinical specialist was provided with the following information: 1) de-identified summary reports computed by the Bateria III software; 2) de-identified TONI-4 results; 3) de-identified scanned copies of the Bateria III and TONI-4 response forms; and 4) de-identified demographic information. Because the new edition of the DSM (i.e., DSM-5) requires evidence of a history of childhood LD, participant responses to two questions from the WTW 18 Screen were also given to the clinical specialist: 1) Did you have a learning problem in secondary school? and 2) Have you had a learning problem in primary school?

Using these materials, the LD specialist provided a clinical diagnosis (i.e., LD or not LD) and a brief clinical report for each participant. Because of the change in DSM criteria, two methods were employed by the clinical specialist, a pattern of strengths and weaknesses (PSW) approach and the DSM-5 approach.

### ***PSW Approach***

The clinical specialist used a PSW approach to determine participants' LD diagnosis.<sup>10</sup> This approach is based on recommendations from research, guidelines provided by the Bateria III, and consistency with DSM-4 criteria. The first step in this approach is to determine whether or not the participant is performing significantly below peers in an academic area. This is accomplished by first examining the broad academic scores and selected academic clusters to see if any academic area is below the 15th percentile or a standardized score of 85. Academic sub-skills are also reviewed. If a participant is performing below the average range in some academic area, the protocol is reviewed to determine areas of weakness. In addition, the level of academic performance is compared to the educational level to determine if it is significantly lower than would be expected given the education level attained.

After reviewing academic performance and contextual factors such as location and level of education and employment history, the cognitive scores are reviewed to determine if any cognitive processes are significantly below peers. If so, the intra-individual pattern of scores is analyzed to determine if there is a significant difference between an area of weakness and other cognitive processes. Participant response patterns are also examined. The pattern of cognitive processes is reviewed for evidence of a cognitive weakness that could contribute to LD. If the participant shows an area of significant cognitive weakness, that cognitive process is compared to the area of academic weakness to determine if the area of cognitive weakness is known to be related to the area of academic weakness. If so, then an overall analysis of the academic and cognitive scores in the context of educational, experiential, and employment factors is reviewed to determine if the profile fits a pattern of strengths and weaknesses indicative of a specific LD.

A brief profile report was developed by the specialist for each participant based on the information provided by CPPR (Bateria III and TONI-4 results, demographic information). The PSW method considers all assessment data available. It relies on clinical appraisal and reflects the current method of considering the entire pattern of performance to determine LD. It is important to note that the clinical

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<sup>10</sup> To help ensure accuracy of diagnosis, a second clinical LD specialist independently provided a diagnosis on 10% of the sample (selected randomly), using the PSW approach. CPPR compared the diagnoses provided by each of the two clinicians to determine inter-rater agreement and reliability. The results indicated that the diagnoses of the two clinicians were significantly correlated ( $r = .75, p < .001$ ). Inter-rater reliability statistics indicated that the two clinicians were statistically reliable ( $ICC = .86, p < .001$ ). These findings show that the two clinicians demonstrated a high level of agreement in PSW diagnoses, which increases our confidence in the accuracy of the clinical diagnoses.

specialist did not interview the participants directly. The clinical specialist's determination of LD status was based on the limited background information provided through the project. A direct interview would be necessary to determine the type of LD the individual might have, if diagnosed as LD, and the types of interventions and/or services from which the individual might benefit.

### ***DSM-5 Approach***

In addition to a diagnosis based on the PSW approach, the clinical specialist provided a diagnosis based on the DSM-5 criteria<sup>11</sup> (see Table 4). This method used information obtained from the standardized tests (i.e., Bateria III and TONI-4), demographic information, and participants' responses to two questions on the WTW 18 Screen regarding learning problems in primary and secondary school. The DSM-5 approach limited the number of participants who were diagnosed as LD (who would otherwise have met the clinical criteria), because of the requirement of a history of childhood learning problems. This approach may be particularly problematic in regard to the current target population, as most of the participants have limited educational histories (8<sup>th</sup> grade average) or even no education, and who for the most part completed their schooling in Latin America (see Discussion section for a more complete discussion regarding the uniqueness of the target population).

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<sup>11</sup> To help ensure accuracy of diagnosis, the second clinical LD specialist (see footnote 9) was also asked to independently provide a diagnosis on 10% of the sample (selected randomly) utilizing the DSM-5 method. CPPR compared the diagnoses provided by each of the clinicians to determine inter-rater agreement and reliability. The results indicated that the diagnoses of the two clinicians were significantly correlated ( $r = .66$ ,  $p < .001$ ). Inter-rater reliability statistics indicated that the two clinicians were statistically reliable ( $ICC = .79$ ,  $p < .001$ ). These findings show that the two clinicians demonstrated a substantial level of agreement in DSM-5 diagnosis.

# PROCEDURE

## RECRUITMENT

Participants were recruited from various agencies in California that provide services to Spanish-speaking, low-income adults. Recruitment sites included community health clinics, Head Start centers, adult education schools, family resource centers, and county social services offices. Participants were recruited from 13 California counties: Contra Costa, El Dorado, Lake, Los Angeles, Mendocino, Merced, Napa, Placer, Sacramento, Solano, Stanislaus, Yolo, and Yuba (see Table 1).

Potential participants were approached by trained Spanish-speaking undergraduate research assistants (RAs) at the recruitment locations. The RAs approached individuals as they waited for or left appointments and briefly explained the study. Interested persons were asked to provide a number for call-back and/or were given a flyer with CPPR's contact information, including a toll-free phone number. Interested individuals were contacted by phone and provided with information about the project. After a brief explanation about the study (i.e., "We are testing the utility of questionnaires that can differentiate among adults with different learning experiences and abilities"), potential participants were administered a demographic questionnaire to determine eligibility. If eligible, an appointment for testing was scheduled at a time convenient for the participant.

## SCREEN AND ASSESSMENT ADMINISTRATION

Participants were tested individually (one-on-one) in a quiet room at or near the location from which they were recruited. As outlined in the following two sections, screens and assessments were administered by graduate-level, highly trained, fluent Spanish-speaking RAs.

The entire testing procedure was conducted in Spanish. All materials were written in Spanish and read to participants. Testing took approximately four hours to complete. Participants were provided with breaks between screens and assessments, as well as additional breaks as needed to minimize fatigue. After completing the testing session, participants received \$150 gift cards for their time.

Postgraduate and graduate RAs received intensive training on the screens and assessments. A certified

Bateria III trainer provided training on the Bateria III to the project director and staff. Administration of the TONI-4 does not require specialized training. Training of the RAs was supervised by the project director who is experienced in psychological testing, including use of the Bateria III and the TONI-4, and who is certified in the use of the Bateria III.

## Screen Administration

After obtaining written consent, an RA administered the three pilot screens. To control for order effects, the order of screen administration was counterbalanced. That is, all screen orders were presented equally across the study. Thus, each pilot screen was administered approximately first 1/3 of the time, second 1/3 of the time, and third 1/3 of the time. The order of presentation was assigned randomly to each participant prior to testing. Screen administration took approximately 45 minutes to complete and was conducted entirely in Spanish.

## Assessment Administration

Immediately following the screen administration, a different RA, who was unaware of the results of the pilot screens, administered the two assessments. The order of the TONI-4 and Bateria III administration was counterbalanced to control for order effects. Thus, the Bateria III was administered first half of the time and second half of the time. The order of the presentation was assigned randomly to each participant prior to testing. The assessment took approximately three hours to complete and was administered in Spanish.

## SCORING: SCREENS AND ASSESSMENTS

The screens and assessments were scored in accordance with guidelines provided by their developers, and the scores were entered into a database. To ensure accuracy, each screen and assessment was scored separately by two trained data RAs. Any discrepancies between the scorers were reviewed and corrected as necessary. To ensure the accuracy of data entry, data were entered separately by two trained data RAs. Any discrepancies in the data entered were reviewed and corrected as necessary.

## CODING

### Bateria Discrepancy Diagnosis (BDD)

Raw scores from each of the Bateria III subscales were entered into a software program provided by the Bateria III developers. The software produces a summary report of standardized scores, discrepancies, and significance probabilities, including:

1. General Intellectual Ability (GIA), which represents a measure of IQ
2. Achievement, which represents a participant's level of academic achievement
3. Standardized scores on the cognitive subscales that combine to form the GIA score
4. Standardized scores on the achievement subscales that combine to form the Achievement score
5. Intra-cognitive and intra-achievement discrepancy scores
6. Ability/achievement discrepancies, which provide information regarding discrepancies between the various cognitive and achievement subscales and, if sufficiently large, are indicative of the specific type of LD the participant may have

Based on the information computed by the Bateria III, a **Bateria Discrepancy Diagnosis (BDD)** was created utilizing the ability/achievement subscales (#6 noted above) as a determinate of LD status. The ability/achievement discrepancy subscales include eight subscale comparisons (e.g., math ability vs. math achievement). A significant discrepancy among any of the eight comparisons is considered indicative of LD. Thus:

1. The BDD was coded as 0 = not LD if the participant did not demonstrate any significant discrepancies among the eight comparisons
2. The BDD was coded as 1 = LD if the participant demonstrated one or more significant discrepancies among the eight comparisons.

The BDD was used as a determinate of LD status in a series of logistic regressions to assess the predictive utility of the three pilot screens (see "Primary Analyses" section).

## Clinical Diagnosis

Two dichotomous (i.e., 0/1 coding) decision scales were developed as determinates of each participant's LD status:

1. **PSW Diagnosis** (coded 0 = not LD, 1 = LD)
2. **DSM-5 Diagnosis** (coded 0 = not LD, 1 = LD)

These dichotomous scales were used in a series of logistic regressions to assess the predictive utility of the three pilot screens (see "Primary Analyses" section).

## Screens

To optimally examine the predictive utility of each of the pilot screens, two or more scores were derived for each screen.<sup>12</sup> These scores included the recommended clinical guidelines provided with each screen, plus one or more total (raw) scores. This was done to increase our flexibility in examining various scoring methods that could potentially maximize the screen's predictive function.

## Empire State Screen

Two scores were derived from the Empire State Screen data:

1. **Empire State Diagnosis (ESD)** –

The ESD is derived from the total number of weighted<sup>13</sup> "yes" responses. A recommended clinical cut-off score of 51+ points (as outlined in Abwender, 2005) was employed to determine the predicted LD status. Participants with (weighted) scores 50 or less were coded 0 = not LD. Participants with (weighted) scores above 50 were coded 1 = LD.

2. **Empire Total Score (ETS)** –

ETS was calculated based on the scoring guidelines in Abwender (2005). The ETS = sum of

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<sup>12</sup> Because the purpose of the present study was the development of a valid screen for predicting the LD status of Spanish-speaking adults, exploring all possibilities was deemed necessary and valid, particularly as the original cut-off scores were based on a different population. The original scoring guidelines regarding the cut-off scores were not assumed to be necessarily valid because of the differences in population and must be tested along with other options.

<sup>13</sup> A weighted score is a score with a value assigned to it. When data are used without weights, each item counts the same as any other item (e.g., all items have a value of 1 point each). Implicit in such use is the assumption that each item has an equal probability of predicting the total score. When deviations from these assumptions are large enough to affect the results obtained from a data set, weighting can help to adjust for assumption violations. When data are weighted, items are assigned differential values, with some items contributing more to the total than others (e.g., items 1 to 5 have a value of 1, item 6 has a value of 5, item 10 has a value of 15).

weighted “yes” responses plus sum of weighted “no” responses minus 614 (a constant).

## WTW 18 Screen

Three scores were derived from the WTW 18 Screen data:

1. **Washington State Diagnosis (WSD)<sup>14</sup>** –

The WSD is derived from the weighted total number of “yes” responses in accordance with the guidelines in the DSHS (1998) report. According to the guidelines, a weighted score of 12 or more is indicative of LD. Participants with weighted scores 11 or below were coded as 0 = not LD. Participants with weighted scores 12 or more were coded as 1 = LD.

2. **Washington Weighted Score (WWS)** –

The WWS is the total number of “yes” responses to the four weighted scoring sections.

3. **Washington Unweighted Score (WUS)** –

The WUS is the total number of “yes” responses to the 13 questions. These scores were left unweighted (i.e., not multiplied by a constant).

## MATILDA-R

Four scores were derived from the MATILDA-R data:

1. **MATILDA-R Diagnosis (MRD)** –

Although the MATILDA-R was modified to better reflect the experience and culture of the current population, the MRD scores were derived from the total number of “yes” responses, consistent with the guidelines provided by Grubb et al. (2001) for the original English MATILDA screen. The guidelines suggest that a score of 13 or more is indicative of a risk for LD. Participants with a score of 12 or less were coded as 0 = not LD. Participants with a score of 13 or more were coded as 1 = LD.

2. **MATILDA-R Total Yes Responses (MTYR)** –

The MTYR is the total number of “yes” responses to the scoring form developed for this project.<sup>15</sup> See Appendix K for a copy of the modified scoring procedure.

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<sup>14</sup> We used the “Washington State Screen” in naming these variables, because the basis for scoring the WTW 18 relies on the scoring method developed for the Washington State Screen. Additionally, it is the statistical properties of the Washington State Screen against which the translated WTW 18 results are compared in this study.

<sup>15</sup> The scoring method for the MATILDA-R was modified to simplify the scoring process. It was determined that the original MATILDA scoring procedure would be too difficult and time-consuming for those who would administer the screen in a real-world setting. Specifically, the screen was being developed for use by case workers in the CalWORKS program. The original scoring method would require substantial training and time to administer.

3. **MATILDA-R Total Errors (MTE) –**

To examine the MATILDA-R further, participants' errors on each task were calculated and summed to obtain a total number of errors. The MTE is the sum of the errors.

4. **MATILDA-R Error Diagnosis (MED) –**

The MED was derived from the MTE scores. Similar to the MRD score, a clinical cut-off score of 13 or more errors was used to derive the MED. The 13+ error cut-off score was based on preliminary analyses of the MATILDA-R, which suggested a significant association between the MED and the BDD and PSW diagnoses using the 13+ cut-off score. Participants with errors scores 12 or less were coded as 0 = not LD. Participants with 13 or more errors were coded as 1 = LD.

# RESULTS

## DESCRIPTIVE STATISTICS

Table 5 provides descriptive information on the three pilot screens (Empire State Screen, WTW 18 Screen, and MATILDA-R). Table 6 provides descriptive information on the two standardized assessments (Bateria III and TONI-4). Both the Bateria III and the TONI-4 use a standardized score of 100 (+/- 15 points) as representing an average IQ. Based on the Bateria III GIA score (a measure of general intellectual ability), the mean IQ for participants was below average (i.e., 78,  $SD = 10.55$ ), although scores on the achievement portion of the Bateria III suggested that the mean level of achievement was within the average range of intellectual achievement (i.e., 88.98,  $SD = 8.68$ ).

The mean IQ score derived from the TONI-4 was 8 points higher (i.e., 85.74,  $SD = 6.75$ ) than the Bateria GIA score, which represents an IQ within the low average range, and is thus closer to the participants' achievement scores on the Bateria III. Preliminary analyses indicated that the difference in IQ scores, between the Bateria III GIA score and the TONI-4 Index score, was statistically significant, such that the Bateria III IQ score was significantly lower than that of the TONI-4 IQ score.<sup>16</sup>

Table 7 shows the correlations among the various scoring methods for each screen (e.g., ESD, WSD) and the three methods of determining LD status (i.e., BDD, PSW, and DSM-5).

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<sup>16</sup> A paired *t*-test was conducted, which indicated significant differences between the Bateria III IQ score and the TONI-4 IQ score,  $t(1039) = 26.91, p < .001$ .

## Table 5

### *Descriptive Statistics for Pilot Screens*

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Empire State Screen <sup>1</sup>		
Empire Total Score (ETS)	Mean = 57.32 ( $SD^2 = 101.55$ )	Range = 0 to 506
WTW 18 <sup>3</sup>		
Washington Weighted Total (WWT)	Mean = 4.89 ( $SD = 6.07$ )	Range = 0 to 30
Washington Unweighted Total (WUT)	Mean = 2.40 ( $SD = 2.67$ )	Range = 0 to 13
MATILDA-R <sup>4</sup>		
MATILDA-R Yes Responses (MYR)	Mean = 11.71 ( $SD = 4.32$ )	Range = 2 to 25
MATILDA-R Total Errors (MTE)	Mean = 12.66 ( $SD = 12.57$ )	Range = 0 to 109

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**Notes:**

<sup>1</sup> Empire State Screen: Scores above 50 are considered to reflect the presence of learning needs

<sup>2</sup>  $SD$  = Standard Deviation

<sup>3</sup> WTW 18: Scores 12 or more (weighted total score) are thought to reflect a risk of LD (as recommended by the developers of the Washington State Screen)

<sup>4</sup> MATILDA-R: Using the cut-off score from the MATILDA, scores of 13 or above suggest the risk of LD

## Table 6

### *Descriptive Statistics for Standardized Assessments*

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Bateria GIA <sup>1</sup> Score	Mean = 78.48 ( $SD^2 = 10.55$ )	Range = 29 to 115
Bateria Achievement Score	Mean = 88.98 ( $SD = 8.68$ )	Range = 48 to 124
TONI-4 Index Score	Mean = 85.74 ( $SD = 6.75$ )	Range = 61 to 117

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**Notes:**

<sup>1</sup> GIA = General Intellectual Ability

<sup>2</sup>  $SD$  = Standard Deviation

**Table 7*****Correlations Among LD Status Criteria and Pilot Screen Scoring Methods (N = 1,040)***

		BDD <sup>1</sup>	PSW <sup>2</sup>	DSM-5 <sup>3</sup>	ESD <sup>4</sup>	ETS <sup>5</sup>	WSD <sup>6</sup>	WWS <sup>7</sup>	WUS <sup>8</sup>	MRD <sup>9</sup>	MTYR <sup>10</sup>	MED <sup>11</sup>	MTE <sup>12</sup>
<b>BDD</b>	<b>Pearson Correlation</b>	1											
	<b>Sig. (2-tailed)</b>												
<b>PSW</b>	<b>Pearson Correlation</b>	.343**	1										
	<b>Sig. (2-tailed)</b>	<.001											
<b>DSM-5</b>	<b>Pearson Correlation</b>	.181**	.382**	1									
	<b>Sig. (2-tailed)</b>	<.001	<.001										
<b>ESD</b>	<b>Pearson Correlation</b>	.248**	.150**	.169**	1								
	<b>Sig. (2-tailed)</b>	<.001	<.001	<.001									
<b>ETS</b>	<b>Pearson Correlation</b>	.232**	.153**	.140**	.827**	1							
	<b>Sig. (2-tailed)</b>	<.001	<.001	<.001	<.001								
<b>WSD</b>	<b>Pearson Correlation</b>	.188**	.050	.194**	.354**	.312**	1						
	<b>Sig. (2-tailed)</b>	<.001	.105	<.001	<.001	<.001							
<b>WWS</b>	<b>Pearson Correlation</b>	.244**	.066*	.232**	.446**	.414**	.832**	1					
	<b>Sig. (2-tailed)</b>	<.001	.034	<.001	<.001	<.001	<.001						
<b>WUS</b>	<b>Pearson Correlation</b>	.247**	.071*	.271**	.463**	.428**	.800**	.969**	1				
	<b>Sig. (2-tailed)</b>	<.001	.023	<.001	<.001	<.001	<.001	<.001					
<b>MRD</b>	<b>Pearson Correlation</b>	.329**	.265**	.199**	.353**	.327**	.314**	.379**	.389**	1			
	<b>Sig. (2-tailed)</b>	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001				

		BDD <sup>1</sup>	PSW <sup>2</sup>	DSM-5 <sup>3</sup>	ESD <sup>4</sup>	ETS <sup>5</sup>	WSD <sup>6</sup>	WWS <sup>7</sup>	WUS <sup>8</sup>	MRD <sup>9</sup>	MTYR <sup>10</sup>	MED <sup>11</sup>	MTE <sup>12</sup>
MTYR	Pearson Correlation	.367**	.257**	.174**	.420**	.388**	.385**	.479**	.486**	.820**	1		
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001			
MED	Pearson Correlation	.285**	.270**	.092**	.302**	.282**	.258**	.313**	.316**	.660**	.683**	1	
	Sig. (2-tailed)	<.001	<.001	.003	<.001	<.001	<.001	<.001	<.001	<.001	<.001		
MTE	Pearson Correlation	.284**	.187**	.047	.286**	.275**	.267**	.323**	.316**	.596**	.739**	.735**	1
	Sig. (2-tailed)	<.001	<.001	.133	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	

**Notes:**

\* Correlation is significant at the  $p < 0.05$  level (2-tailed)

\*\* Correlation is significant at the  $p < 0.001$  level (2-tailed)

<sup>1</sup> BDD = Bateria Discrepancy Diagnosis

<sup>2</sup> PSW = Pattern of Strengths and Weaknesses

<sup>3</sup> DSM-5 = Diagnostic and Statistical Manual, 5<sup>th</sup> Edition

<sup>4</sup> ESD = Empire State Diagnosis

<sup>5</sup> ETS = Empire Total Score

<sup>6</sup> WSD = Washington State Diagnosis

<sup>7</sup> WWS = Washington Weighted Score

<sup>8</sup> WUS = Washington Unweighted Score

<sup>9</sup> MRD = MATILDA-R Diagnosis

<sup>10</sup> MTYR = MATILDA-R Total Yes Responses

<sup>11</sup> MED = MATILDA-R Error Diagnosis

<sup>12</sup> MTE = MATILDA-R Total Errors

Table 8 provides descriptive information concerning the number of participants screened as at risk of LD by the pilot screens and the number of participants identified as LD by the three methods used to determine LD status (the BDD, PSW clinical approach, and DSM-5 criteria approach).

## Table 8

### *Number of Participants Identified as Learning Disabled (N = 1,040)*

	Screened Negative for LD	Screened Positive for LD
Empire State Diagnosis <sup>1</sup>	<i>n</i> = 734	<i>n</i> = 306 (29.4%)
Washington State Diagnosis <sup>2</sup>	<i>n</i> = 888	<i>n</i> = 152 (14.6%)
MATILDA-R Diagnosis <sup>3</sup>	<i>n</i> = 661	<i>n</i> = 379 (36.4%)
	Identified as Not LD	Identified as LD
Bateria Discrepancy Diagnosis <sup>4</sup>	<i>n</i> = 806	<i>n</i> = 234 (22.5%)
PSW Clinical Diagnosis <sup>5</sup>	<i>n</i> = 868	<i>n</i> = 172 (16.5%)
DSM-5 Clinical Diagnosis <sup>6</sup>	<i>n</i> = 917	<i>n</i> = 123 (11.8%)

#### Notes:

<sup>1</sup> Based on the scoring guidelines provided by the Empire State Screen (Abwender, 2005)

<sup>2</sup> Based on the scoring guidelines provided by the Washington State Screen (DSHS, 1998)

<sup>3</sup> Based on the scoring guidelines provided by the MATILDA (Grubb et al., 2001)

<sup>4</sup> Diagnosis based on the Bateria III ability/achievement discrepancy scores computed by the Bateria III software

<sup>5</sup> Clinical diagnosis based on the PSW method

<sup>6</sup> Clinical diagnosis based on the DSM-5 criteria

## PRIMARY ANALYSES

The results outlined here are organized into several sections. We will discuss the predictive models of LD organized by screening measure. In these models, univariate logistic regressions were used to predict each case of LD from the scores and diagnoses available from each screening measure. For each logistic regression, one of the scoring variables (e.g., ESD, ETS, WUS) was entered as a predictor of each of the LD diagnosis methods (BDD, PSW, and DSM-5). The overall accuracy (percent correct LD and non-LD classifications), sensitivity (percent of LD participants who were correctly identified as LD), and specificity (percent of non-LD participants who were correctly identified as not LD) of each screen is discussed.

Our indices of LD are the BDD and the two clinical diagnoses (the PSW approach and the DSM-5 criteria). All of these measures are dichotomous, meaning that there are two possible classifications – the participant is identified as LD or the participant is identified as not LD. Tables 9 through 11 provide a summary of each screen’s overall accuracy, sensitivity, and specificity rates across the three methods of determining LD.

### Empire State Screen

The Empire State Screen provides a total weighted score (Empire Total Score or ETS) and a recommended diagnostic score (LD or not LD) based on the ETS. The Empire State Diagnosis (ESD) is created on a cut-off score of 51 from the ETS. That is, participants scoring more than 50 total weighted points are recommended for further clinical testing.

### Empire State Diagnosis (ESD)

The **ESD** resulted in 306 of the 1,040 subjects being recommended for further testing for LD. This diagnosis was significantly associated with the BDD, the PSW diagnosis, and the DSM-5 diagnosis. The ESD explained (or accounted for) 9% of the variability<sup>17</sup> in the BDD and had an accuracy of 70.8%, a

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<sup>17</sup> Statistically, variance is one measure of how far scores deviate from the center of the distribution (i.e., from the mean). Variance is frequently partitioned into that which can be attributed to a specific condition (explained) and that which is assigned to unmeasured conditions (unexplained). The higher the explained variance is (relative to the total variance), the stronger (or larger) the effect of an identified variable is considered to be [e.g., pilot screen (the identified variable) explaining BDD variance]. For example, the variance of the BDD is .20 and the Empire State Screen accounts for .02 of that variance. One standard for determining meaningfulness in the social sciences suggests that 1% is small, 10% is moderate, and 25% is large in amount of variance explained.

sensitivity of 50.4%, and a specificity of 76.7%. The ESD explained 4% of the variability in the PSW diagnosis with an accuracy of 68.8%, a sensitivity of 44.8%, and a specificity of 73.6%. In terms of the DSM-5 diagnosis, the ESD explained 5% of its variability and had an accuracy of 70.7%, a sensitivity of 50.4%, and a specificity of 73.4%.

## **Empire Total Score (ETS)**

The **ETS** was then examined to determine if there was a more optimal cut-off score in our population. The ETS explained 7% of the variability in the BDD and had a peak accuracy of 77.7%; however, this cut-off score had poor sensitivity (2.6%) as most of the accuracy was based on its specificity (99.5%). If we look to obtain a higher level of sensitivity, there is a cut-off (i.e., 10) that provides an overall accuracy rate of 67.0%, with 58.5% sensitivity and 69.5% specificity.

The ETS was also significantly associated with the PSW diagnosis and the DSM-5 diagnosis. The ETS explained 3% of the variability in the PSW diagnosis and 3% of the variation in the DSM-5 diagnosis. The accuracy of the ETS is maximized when no participants are recommended for further testing; however, such a decision has 0% sensitivity. There was no “good” cut-off based on the PSW diagnosis or the DSM-5 diagnosis, because the ETS explained very little variance in these diagnoses.

## ***Summary of Results from the Empire State Screen***

The ETS and the ESD were all significantly associated with the BDD, PSW diagnosis, and DSM-5 diagnosis. However, the Empire State scores had poor sensitivity ratings and explained less variability in these diagnoses than the other two screens.

## **WTW 18 State Screen**

The WTW 18 Screen provides two scores (Washington Weighted Score [WWS], and Washington Unweighted Score [WUS]), and a recommended diagnostic score (Washington State Diagnosis or WSD) based on the WWS. The WSD is created from the cut-score of 12 on the WWS. That is, participants scoring 12 or more total weighted points are recommended for further clinical testing.

## **Washington State Diagnosis (WSD)**

The **WSD** resulted in 152 of the 1,040 subjects being recommended for further testing for possible LD. This diagnosis was significantly associated with the BDD and the DSM-5 diagnosis, but was not

significantly associated with the PSW diagnosis. The WSD explained 5% of the variability in the BDD and had an accuracy of 75.0%, a sensitivity of 26.9%, and a specificity of 89.0%. In terms of the DSM-5 diagnosis, the WSD explained 6% of its variability and had an accuracy of 81.4%, a sensitivity of 33.3%, and a specificity of 87.9%.

## Washington Weighted Score (WWS)

The WWS and the WUS were then examined to determine if there was a more optimal cut-off score in our population. The **WWS** explained 8% of the variability in the BDD and had a peak accuracy of 78.3%; however, this cut-off score had poor sensitivity (11.5%), and its accuracy was mostly based on its specificity (97.6%). If we look to obtain a reasonable level of sensitivity, a cut-off score of 3 provides an overall accuracy rate of 61.7%, with 63.2% sensitivity and 61.3% specificity.

The WWS was also significantly associated with the PSW diagnosis and the DSM-5 diagnosis. The WWS explained 1% of the variability in the PSW diagnosis and 9% of the variation in the DSM-5 diagnosis. The accuracy of the WWS is maximized when no participants are recommended for further testing; however, such a decision has 0% sensitivity. There was no “good” cut-off based on the PSW diagnosis because the WWS explained very little variance in this diagnosis. Cut-off scores either had high accuracy (i.e., > 70%) and very little sensitivity (i.e., < 30%) or low accuracy and high sensitivity. For the DSM-5 diagnosis, there were cut-off scores that were fairly accurate with adequate sensitivity and specificity. A cut-off score of 6 yields an accuracy of 70.3%, a sensitivity of 63.4%, and a specificity of 71.2%.

## Washington Unweighted Score (WUS)

The **WUS** explained 8% of the variability in the BDD and had a peak accuracy of 78.0%. However, this cut-off score had poor sensitivity (5.6%) as most of the accuracy was based on its specificity (99.0%). If we look to obtain a reasonable level of sensitivity, there is a cut-off score (i.e., 2) that is 59.3% accurate, with 66.7% sensitivity and 57.2% specificity.

The WUS was also significantly associated with the PSW diagnosis and the DSM-5 diagnosis. The WUS explained 1% of the variability in the PSW diagnosis and 12% of the variation in the DSM-5 diagnosis. The accuracy of the WUS is maximized when no participants are recommended for further testing; however, such a decision has 0% sensitivity. There was no “good” cut-off based on the PSW diagnosis, because the WUS explained very little variance in this diagnosis. For the DSM-5 diagnosis, however,

there were cut-off scores that were fairly accurate with adequate sensitivity and specificity. An example cut-off score of 3 had an accuracy of 68.8%, a sensitivity of 73.2%, and a specificity of 68.3%.

### ***Summary of Results from the WTW 18 Screen***

Overall, the results from the WTW 18 Screen showed that the scores it produces were significant predictors of having LD based on the BDD, the PSW diagnosis, and to a lesser extent the DSM-5 diagnosis. The WUS had the most predictive power of the WTW 18 Screen scores. This score had lower predictive power than the MATILDA-R Diagnosis (see next section) when the BDD and the PSW diagnosis were the outcome of interest, but had greater predictive accuracy for the DSM-5 diagnosis. Our recommended cut-off on the WUS is a score of 3 or more. That is, participants with a score of 3 or higher would be recommended for further testing. This cut-off score explained 14% of the variation in DSM-5 diagnosis and had an accuracy of 68.8%, a sensitivity of 73.2%, and a specificity of 68.3%.

## **MATILDA-R**

The MATILDA-R provided four scores to evaluate: 1) the MATILDA-R Diagnosis (MRD), 2) the MATILDA-R Total Yes Responses (MTYR), 3) the MATILDA-R Total Errors (MTE), and 4) the MATILDA-R Error Diagnosis (MED).

### **MATILDA-R Diagnosis (MRD)**

The **MRD** is based on the MTYR, with a cut-off score of 13 or more as indicative of a risk for LD. Participants with scores of 13 or greater are recommended for further testing, whereas participants with scores less than 13 are not recommended for further testing.

Based on the MRD, 379 participants would be recommended for further LD testing (661 not recommended), and this diagnosis was significantly associated with the BDD, the PSW diagnosis, and the DSM-5 diagnosis. The MRD explained 15% of the variability in the BDD and had an accuracy of 70.7%, a sensitivity of 65.8%, and a specificity of 72.1%. The MRD explained 11% of the variability in the PSW diagnosis and had an accuracy of 68.6%, a sensitivity of 65.1%, and a specificity of 69.2%. In terms of the DSM-5 diagnosis, the MRD explained 7% of its variability and had an accuracy of 66.5%, a sensitivity of 62.6%, and a specificity of 67.1%.

## MATILDA-R Total Yes Responses (MTYR)

The **MTYR** is simply the total number of ‘yes’ responses on the MATILDA-R (based on the modified scoring form, see Appendix K). Because the recommended cut-off score of 13 may not be optimal for our population, the MTYR was also examined. The MTYR explained 18% of the variability in the BDD and had a peak accuracy of 79.6%; however, this cut-off score, which optimizes accuracy, had poor sensitivity (18.8%) as most of the accuracy was based on its specificity (97.3%). If we look to obtain a more reasonable level of sensitivity, there is a cut-off (i.e., 12) that is 65.6% accurate, with 75.2% sensitivity and 62.8% specificity (in addition to the cut-off score that was used for the MRD).

The MTYR was also significantly associated with the PSW and DSM-5 Diagnoses. The MTYR explained 10% of the variability in the PSW diagnosis and 5% of the variability in the DSM-5 diagnosis. The accuracy of the MTYR is maximized when no participants are recommended for further testing; however, such a decision has 0% sensitivity. When an acceptable level of sensitivity is obtained (e.g., 60%), accuracy is 68.6% for the PSW diagnosis and 66.5% for the DSM-5 (using a cut-off score of 13).

## MATILDA-R Error Diagnosis (MED)

The third score from the MATILDA-R is the **MED**, which is based on the number of errors committed on the structured tasks, with a cut-off score of 13 or more errors. If the participant had 13 or more errors, then the participant would be recommended to receive further testing.

The MED score indicated that 334 participants should be recommended for further LD testing (706 not recommended), and this diagnosis was significantly associated with the BDD, the PSW diagnosis, and the DSM-5 diagnosis. The MED explained 11% of the variability in the BDD and had an accuracy of 71.0%, a sensitivity of 56.8%, and a specificity of 75.1%. The MED explained 11% of the variability in the PSW diagnosis and had an accuracy of 71.3%, a sensitivity of 60.5%, and a specificity of 73.5%. Finally, in terms of the DSM-5 diagnosis, the MED explained 2% of its variability and had an accuracy of 66.4%, a sensitivity of 43.9%, and a specificity of 69.5%.

## MATILDA-R Total Errors (MTE)

The fourth and final score from the MATILDA-R is the **MTE**. The MTE is the total number of errors on the MATILDA-R. The MED is derived from the MTE, with a cut-off of 13. Because this cut-off score may not be optimal, we examined the MTE as a scoring option. The MTE explained 10% of the variability in the

BDD and had a peak accuracy of 78.8%; however, this cut-off score, which optimizes accuracy, had poor sensitivity (9.8%) as most of the accuracy was based on its specificity (98.8%). If we look to obtain a reasonable level of sensitivity, there is a cut-off (i.e., 9) that is 62.2% accurate, with 74.8% sensitivity and 58.6% specificity (in addition to the cut-off that was used for the MED).

The MTE was significantly associated with the PSW diagnosis, but it was not significantly associated with the DSM-5 diagnosis. The MTE explained 5% of the variability in the PSW diagnosis and 0% of the variability in the DSM-5 diagnosis. The accuracy of the MTE is maximized when no participants are recommended for further testing; however, this decision would result in 0% sensitivity. When an adequate level of sensitivity is obtained (e.g., 60%), accuracy is 66.3% for the PSW. We do not report accuracy for the DSM-5 diagnosis because the Matilda Error Score was not significantly associated with the DSM-5 diagnosis.

### ***Summary of Results from the MATILDA-R***

Overall, the results from the MATILDA-R showed that the MRD was a significant predictor of having LD based on the BDD, the PSW diagnosis, and DSM-5 diagnosis, and that this diagnosis (along with the MTE) was more predictive than the MED or the MTYR. The MED had an accuracy of 70.7%, a sensitivity of 65.8%, and a specificity of 72.1% when LD status was based on the BDD. These values were 68.6% (accuracy), 65.1% (sensitivity), and 69.2% (specificity) when using the PSW diagnosis, and 66.5%, 62.6%, and 67.1%, respectively, when using the DSM-5 diagnosis. When attempting to optimize the cut-off score on the MTYR, we obtained similar results. Because this cut-off score will not be evaluated in a new sample, we recommend using the MRD (rather than the other three MATILDA-R indices) as a basis for making recommendations for further LD testing.

### **Important Considerations in Selecting a Screening Measure**

Overall, the three LD screening measures provided the highest percentage of explained variance (or effect size) in the BDD relative to the PSW and the DSM-5 (with the exception of the WUS method in the WTW 18 Screen, which provided the highest percentage of explained variance in the DSM-5). This is partly due to the fact that the BDD had a higher base rate for LD (i.e., the BDD indicated more participants were LD than the PSW and DSM-5 diagnoses). Thus, the greatest accuracy was achieved when using this outcome measure.

In determining the best cut-off scores, it is important to note that cut-off rules can be chosen based on objective and/or subjective factors. Recommended cut-off scores, for instance, can be based objectively on the highest accuracy without consideration for sensitivity and specificity, or one can more subjectively consider giving more prominence to sensitivity or specificity to meet an overarching goal. For instance, in the context of identifying CalWORKs applicants who may need specialized services to overcome LD and be successful in finding employment, sensitivity may be especially important, because of the value of not missing individuals with LD. Alternatively, to avoid the costs associated with doing comprehensive LD diagnoses for a large number of applicants without LD, it may be important to avoid over-identifying LD. In the recommendations we offer in the summary section below we tried to balance accuracy with sensitivity and specificity, while obtaining an adequate level of sensitivity where possible because we placed a good bit of importance on correctly classifying participants who are LD.

## RESULTS SUMMARY

Overall, the MATILDA-R was associated with all three LD diagnosis methods and was the best predictor of the BDD and the PSW diagnosis. The previously recommended cut-off on the MTYR was useful for our population, and this cut-off score is recommended for continued use. The WTW 18 Screen was not as useful as the MATILDA-R when the outcome of interest was the BDD or the PSW diagnosis; however, the WUS from the WTW 18 Screen was most predictive of the DSM-5 diagnosis. Therefore, our final recommendations depend on which LD diagnosis method is considered most important. . If the BDD or the PSW diagnosis is utilized, the MATILDA-R (utilizing the MRD scoring option) is the best option, with an accuracy of 70.7%, a sensitivity of 65.8%, and a specificity of 72.1% for the BDD and an accuracy of 68.6%, a sensitivity of 65.1%, and a specificity of 69.2% for the PSW diagnosis. If the DSM-5 diagnosis is utilized, the WTW 18 Screen (utilizing the WUS with cut-off of 3 or more as the scoring option) may be more useful, with an accuracy of 68.8%, a sensitivity of 73.2%, and a specificity of 68.3%.

**Table 9*****Bateria Discrepancy Diagnosis (BDD): Screen Accuracy, Sensitivity, Specificity, and Variance Explained***

	Accuracy	Sensitivity <sup>1</sup>	Specificity <sup>2</sup>	Variance Explained <sup>3</sup>
<b>Empire State Screen</b>				
Empire State Diagnosis (ESD)	70.8%	50.4%	76.7%	9.0%
Empire Total Score (ETS)	77.7%	2.6%	99.5%	7.0%
<b>WTW 18 Screen</b>				
Washington State Diagnosis (WSD)	75.0%	26.9%	89.0%	5.0%
Washington Weighted Score (WWS)	78.3%	11.5%	97.6%	8.0%
Washington Unweighted Score (WUS)	78.0%	5.6%	99.0%	8.0%
<b>MATILDA-R</b>				
MATILDA-R Diagnosis (MRD)	70.7%	65.8%	72.1%	15.0%
MATILDA-R Total Yes Responses (MTYR)	79.6%	18.8%	97.3%	18.0%
MATILDA-R Error Diagnosis (MED)	71.0%	56.8%	75.1%	11.0%
MATILDA-R Total Errors (MTE)	78.8%	9.8%	98.8%	10.0%

**Notes:**

<sup>1</sup> Sensitivity refers to the screen's ability to correctly identify individuals as LD who have been determined to be LD by the criterion (BDD, PSW, or DSM-5)

<sup>2</sup> Specificity refers to the screen's ability to correctly reject (screen out) individuals as not LD who have been identified as not LD by the criterion

<sup>3</sup> Variance is one measure of how far scores deviate from the center of the distribution. Variance is frequently partitioned into that which can be attributed to a specific condition (explained) and that which is assigned to other unmeasured conditions (unexplained). The higher the explained variance (relative to the total variance), the stronger the effect of an identified variable (e.g., pilot screen).

**Table 10*****Pattern of Weaknesses and Strengths (PSW) Clinical Diagnosis: Screen Accuracy, Sensitivity, Specificity, and Variance Explained***

	Accuracy	Sensitivity <sup>1</sup>	Specificity <sup>2</sup>	Variance Explained <sup>3</sup>
<b>Empire State Screen</b>				
Empire State Diagnosis (ESD)	68.8%	44.8%	73.6%	4.0%
Empire Total Score (ETS) <sup>4</sup>	—	—	—	3.0%
<b>WTW 18 Screen</b>				
Washington State Diagnosis (WSD) <sup>5</sup>	—	—	—	0.0%
Washington Weighted Score (WWS) <sup>4</sup>	—	—	—	1.0%
Washington Unweighted Score (WUS) <sup>4</sup>	—	—	—	1.0%
<b>MATILDA-R</b>				
MATILDA-R Diagnosis (MRD)	68.6%	65.1%	69.2%	11.0%
MATILDA-R Total Yes Responses (MTYR)	60.0%	68.6%	51.4%	10.0%
MATILDA-R Error Diagnosis (MED)	71.3%	60.5%	73.5%	11.0%
MATILDA-R Total Errors (MTE)	60.0%	66.3%	53.7%	5.0%

**Notes:**

<sup>1</sup> Sensitivity refers to the screen's ability to correctly identify individuals as LD who have been determined to be LD by the criterion (BDD, PSW, or DSM-5)

<sup>2</sup> Specificity refers to the screen's ability to correctly reject (screen out) individuals as not LD, who have been identified as not LD by the criterion

<sup>3</sup> Variance is one measure of how far scores deviate from the center of the distribution. Variance is frequently partitioned into that which can be attributed to a specific condition (explained) and that which is assigned to other unmeasured conditions (unexplained). The higher the explained variance (relative to the total variance), the stronger the effect of an identified variable (e.g., pilot screen).

<sup>4</sup> Variance explained was too low to permit the selection of a cut-off score that would allow reasonable calculation of accuracy rates

<sup>5</sup> Association between the WSD and PWS was not significant

**Table 11*****DSM-5 Clinical Diagnosis: Screen Accuracy, Sensitivity, Specificity, and Variance Explained***

	Accuracy	Sensitivity <sup>1</sup>	Specificity <sup>2</sup>	Variance Explained <sup>3</sup>
<b>Empire State Screen</b>				
Empire State Diagnosis (ESD)	70.7%	50.4%	73.4%	5.0%
Empire Total Score (ETS) <sup>4</sup>	—	—	—	3.0%
<b>WTW 18 Screen</b>				
Washington State Diagnosis (WSD)	81.4%	33.3%	87.9%	6.0%
Washington Weighted Score (WWS)	70.3%	63.4%	71.2%	9.0%
Washington Unweighted Score (WUS)	68.8%	73.2%	68.3%	14.0%
<b>MATILDA-R</b>				
MATILDA-R Diagnosis (MRD)	66.5%	62.6%	67.1%	7.0%
MATILDA-R Total Yes Responses (MTYR)	60.0%	66.5%	53.5%	5.0%
MATILDA-R Error Diagnosis (MED)	66.4%	43.9%	69.5%	2.0%
MATILDA-R Total Errors (MTE) <sup>5</sup>	—	—	—	0.0%

**Notes:**

<sup>1</sup> Sensitivity refers to the screen's ability to correctly identify individuals as LD who have been determined to be LD by the criterion (BDD, PSW, or DSM-5)

<sup>2</sup> Specificity refers to the screen's ability to correctly reject (screen out) individuals as not LD, who have been identified as not LD by the criterion

<sup>3</sup> Variance is one measure of how far scores deviate from the center of the distribution. Variance is frequently partitioned into that which can be attributed to a specific condition (explained) and that which is assigned to other unmeasured conditions (unexplained). The higher the explained variance (relative to the total variance), the stronger the effect of an identified variable (e.g., pilot screen).

<sup>4</sup> Variance explained was too low to permit the selection of a cut-off score that would allow reasonable calculation of accuracy rates

<sup>5</sup> Association between the MTE and DSM-5 Diagnosis was not significant

## DISCUSSION

The purpose of the current project was to develop a valid measure to screen for LD in Spanish-speaking adults eligible to enroll in the CalWORKs program. To this end, CPPR examined the utility and validity of three screening measures: the Empire State Screen, the WTW 18 Screen, and the MATILDA-R. In the following sections we summarize the major findings, discuss issues relative to the selection of a final screen, and offer recommendations.

### DETERMINING LD

Because of the complexity in determining an individual's LD status, three methods were employed in classifying individuals enrolled in the present project. How LD status is determined by clinical LD specialists in California may vary depending on training and licensing requirements. We recommend that CDSS examine how contracted clinicians diagnose LD, specifically what methods and criteria are employed and expect to be employed in the near future. This information will be useful in determining which of the following methods of diagnosing LD (i.e., BDD, PSW, DSM-5) is or will be most commonly used by clinicians working with the CalWORKs program and thereby which study method is of most relevance to the goals of CDSS. Each screen performed better or worse, depending on the determinant of LD status used. Having more information about commonly used clinical approaches will be important for making an informed decision about screen choices. For the present project, we utilized the following methods to diagnose LD:

1. The Bateria Discrepancy Diagnosis (i.e., BDD)

The BDD was derived from the discrepancy scores generated by the Bateria III results. This method most closely matches the criteria established by the APA in the 4th edition of the DSM. One of the main criteria of the DSM-4 was the presence of a significant discrepancy between ability and achievement in establishing LD. Thus, an individual was classified as LD if the results of the Bateria III indicated at least one significant discrepancy among the eight ability/achievement subscale comparisons.

Significant statistical associations between the pilot screens and the BDD would suggest that a screen has some predictive utility in screening for LD when the method of determining actual LD status was the BDD. These results would be consistent with the DSM-4 criteria.

## 2. The PSW approach

This method most closely matches the clinical interview method often used by clinicians in determining LD status. The PSW approach utilizes all available information to determine LD, including the results of standardized tests (e.g., Bateria III), and information regarding an individual's schooling, employment, and daily functioning. A clinical interview is often conducted to obtain such information. For this project, the clinical specialist did not interview the participants directly. Instead, the clinical specialist's determination of LD status was based on the limited background information provided through the project.<sup>18</sup> A clinical interview would be necessary to determine with more precision the type of LD, if any, the participant demonstrated and the types of accommodations and/or services from which the individual could benefit.

Significant statistical associations between the pilot screens and the PSW diagnosis would suggest that a screen has some predictive utility in screening for LD when the method of determining actual LD status was a clinical interview approach.

## 3. The DSM-5 approach

During the course of the project, the APA significantly revised the criteria to determine LD. The new criteria de-emphasize the need to show evidence of significant discrepancies between ability and achievement, and add the requirement to show evidence of a history of childhood LD.

Significant statistical associations between the pilot screens and the DSM-5 diagnosis would suggest that a screen has some predictive utility in screening for LD when the method of determining actual LD status was a DSM-5 clinical approach.

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<sup>18</sup> Indirect assessment of participants by a clinical specialist, as in this project, might affect the accuracy of diagnosis for those participants who were borderline learning disabled and/or who showed some evidence of intellectual deficiency. More testing would be needed to give a definitive diagnosis for a minority of participants who showed some evidence of a disability (1.4%), but who did not meet the full criteria, and for those participants who might be intellectually deficient (5.2%) rather than learning disabled. By using multiple methods of diagnosis, however, the probability of accurate LD identification increased for these participants (e.g., some participants were diagnosed as LD by one method, but diagnosed as not LD by the one or two of the other methods). Additionally, more information through direct assessment would assist the clinician in identifying the specific type of LD.

## SCREEN PROPERTIES

### Bateria Discrepancy Diagnosis (BDD) as the LD Status Determinant

Regardless of which scoring method was utilized (e.g., ESD or ETS), all three screens were significantly associated with the diagnosis derived from the BDD, with overall accuracy rates ranging from 71% to 80%. The relatively high rates of accuracy, however, were primarily due to each screen's specificity, or the capacity of each screen to predict that a person did not have LD. The ability to correctly identify individuals with LD, however, was for the most part quite low (3% to 50%), indicating that most individuals who have LD would not be identified. Thus, few individuals with LD would be recommended for further testing, and those individuals needing services would remain underserved.

The one exception was the MATILDA-R with overall accuracy rates ranging from 71% to 80%, and sensitivity rates of 66% (utilizing the MRD) and 57% (utilizing the MED). Additionally, in terms of the BDD, the MATILDA-R was associated with higher rates of "explained variance" (10% to 18%) than were the Empire State Screen (7% and 9%) and the WTW 18 Screen (5% to 8%).

### PSW Clinical Diagnosis as the LD Status Determinant

The Empire State Screen and the WTW 18 Screen were only weakly (or not at all) associated with the criterion when the diagnosis was based on the PSW approach by the clinical specialist. Because the explained variance was too low (ranging from 0% to 4%), only the Empire State Screen (utilizing the ESD) permitted the calculation of diagnostic cut-off scores and the reporting of accuracy rates. Again, however, the Empire State Screen demonstrated low sensitivity (45%) to correctly identify individuals with LD. Thus, few individuals would be correctly identified as LD and recommended for further testing.

The MATILDA-R, however, did provide some predictive utility when the LD status determinant was based on the PSW approach. Overall accuracy rates ranged from 60% to 71% with sensitivity rates ranging from 61% to 69%, with the MRD scoring option providing the best balance among the three accuracy measures (69% overall accuracy, 65% sensitivity, and 69% specificity).

## DSM-5 Clinical Diagnosis as the LD Status Determinant

In general, all three screens provided some predictive utility when the LD status determinant was based on the DSM-5 criteria. Overall accuracy rates ranged from 60% to 81%, with sensitivity rates that ranged from 33% to 73%. The WTW 18 Screen (utilizing the WUS scoring option) provided the best balance among the three measures of accuracy, with a sensitivity of 73% and a specificity of 68%.

## CONSIDERATIONS AND RECOMMENDATIONS

### Uniqueness of Target Population

The current sample was selected to be representative of the sample of Spanish-speaking adults enrolled in the CalWORKs program. Using demographic information provided by CDSS about CalWORKs recipients, participants were selected into the current project if their demographic characteristics closely matched those associated with individuals eligible for CalWORKs enrollment (e.g., age, income, whether participant had children), and of course for this study, Spanish-language dominance.

On average, the highest level of education was approximately 8<sup>th</sup> grade, with 34% of the sample having only a primary school education. Most (98%) of our participants were born outside of the U.S. and 99% of all participants completed at least some (an average of 8 years) of their schooling in a Latin American country. Given the differences in educational systems among the various countries (perhaps even within countries) and the U.S., it is unclear how much correspondence there is between U.S. educational standards and outcomes and the educational standards and outcomes in the countries represented in the current sample. For these reasons, the current sample may characterize a unique segment of the Spanish-speaking population in the U.S. To an extent, research with the study sample of participants reflects uncharted waters, particularly with respect to LD. Because of the paucity of studies available on participants with characteristics similar to those in this sample (i.e., Spanish-speaking, low-income, low education, immigrant), there is little other research to guide the development of an LD screen.

Additionally, the uniqueness of the target population may make diagnosing LD more complicated, particularly with respect to the new DSM-5 standards. For instance, both the DSM-4 and DSM-5 require that an individual demonstrates below-average chronological-age learning and academic skills, which are typically assessed by standardized assessments such as the Bateria III. Because of the low academic

attainment of many in this population, such a standard may be difficult to demonstrate, particularly among those with little or no schooling. Moreover, there is some indication that the Bateria III, although standardized with Spanish-speakers, may underestimate the intellectual ability of the target population because of the heavy reliance that the Bateria III, like most standardized assessments, places on language. For this reason, we also utilized the TONI-4 (which does not require verbal responses) as an additional measure of IQ. The findings did indeed show a statistically higher average IQ on the non-verbal IQ measure, namely the TONI-4, compared to the average IQ scores based on the Bateria III. The new requirement of the DSM-5 for evidence of childhood LD-related problems may also add to the difficulty of correctly identifying individuals with LD in the target population. Because problems in learning and academic skills would most likely be noticed in a school setting, patterns of “below average for expected age” learning and academic skills may not have surfaced for many individuals in our sample, and few (if any) of those in the sample population would have been likely to be referred to a specialist, such as a school psychologist or clinician, for further testing. This is particularly true for those participants (the majority in this sample) who completed most or all of their schooling in Latin America. For this population, an examination of functioning across various contexts (e.g., schooling, employment, and family) may take on increased importance in accurately diagnosing LD. These are important questions that need to be addressed in future research among researchers and practitioners in the LD assessment field.

## Screen Choice Considerations

Pilot screens were selected for testing based on the ease with which the screens could be administered, scored, and interpreted. For the purposes for which the screen would be utilized, the ideal screen would need to be easy to administer, score, and interpret by the individuals (e.g., CalWORKs case workers) administering the screens. The screen would also need to be relatively inexpensive to produce and would require relatively little training to implement. Moreover, the ideal screen should provide a reasonable level of accuracy in predicting whether an individual was (or was not) LD, so that individuals needing services would be recommended for further LD testing and thus receive the necessary benefits. Ultimately, the aim is to help Spanish-speaking individuals with LD to receive services that would permit them to obtain and retain adequate and stable employment for the benefit of themselves and their families. The screens selected for the present project met these conditions to varying degrees.

## Statistical Associations and Variance

To an extent, all three screens were significantly associated with the three methods of determining LD. The exceptions were non-significant associations between the WTW 18 Screen (utilizing the WSD scoring method) and the PSW determinant, and the MATILIDA-R (utilizing the MTE scoring method) and the DSM-5 determinant (see Tables 10 and 11).

All three screens, regardless of the scoring method employed, were significantly associated with the BDD, with explained variance ranging from 5% to 18%. As explicated earlier, variance is a measure of how scores deviate from the center of the distribution (e.g., from the statistical mean), and is often partitioned into “explained” and “unexplained” variance. In this instance, with respect to the BDD, the MATILDA-R was associated with the highest percentage of explained variance (10% to 18%; see Table 9).

Although all three screens were significantly associated with the PSW (except for the WSD scoring option), the WTW 18 Screen demonstrated such low explained variance that it was not possible to establish a cut-off score to determine LD status. This was also true for the Empire State Screen when utilizing the ETS scoring option. Again, the MATILDA-R demonstrated the highest percentage of explained variance (ranging from 5% to 11%) when the PSW method was the determinant of LD status (see Table 10).

The pilot screens were also significantly associated with the DSM-5 approach, with the exception of the MTE scoring option (see Table 11). The ETS scoring option on the Empire State Screen and the MTE scoring option on the MATILA-R had explained variances that were too low to establish cut-off scores to determine LD. With respect to explained variance, the WTW 18 Screen showed the highest range of explained variance (6% to 12%) when the LD determinant was the DSM-5.

## Accuracy, Sensitivity, and Specificity

Three measures of accuracy were examined: overall accuracy, sensitivity, and specificity. A screen’s overall accuracy is determined by a screen’s sensitivity and specificity. Sensitivity refers to the screen’s ability to correctly predict that a person with LD indeed has LD (as determined by the criterion). In contrast, specificity refers to the screen’s ability to correctly predict that a person who does not have LD indeed does not have LD (as determined by the criterion). In general, a balance between sensitivity and specificity is important, although one or the other may be given prominence in the decision-making process depending on the goals under consideration.

For instance, if the primary goal is to provide services for as many individuals with LD as possible, then the screen's sensitivity might take precedence in the decision-making process. Greater sensitivity would ensure that fewer people with LD would be missed (or misidentified) by the screen as not having LD when they in fact have LD. For instance, a screen with higher sensitivity (e.g., 73%) ratings would recommend that a greater number of individuals be referred for testing than a screen with lower sensitivity ratings (e.g., 65%). Consequently, more individuals with possible LD would be tested and identified as LD and thereby receive needed services.

Alternatively, if cost is a major consideration, then overall accuracy would need to be balanced by the screen's specificity. Greater specificity would reduce the number of false positives (i.e., fewer individuals would be misidentified as LD when they in fact do not have LD) and thus reduce the number of those referred for further testing, thereby reducing the costs of unnecessary testing. For instance, a screen with higher specificity (e.g., 89%) would result in fewer individuals being referred for further testing than a screen with lower specificity (e.g., 68%). The cost of full testing would be reduced as fewer non-LD people would be referred for further testing. In general, a balance between these two measures is recommended, with prominence being given to the measure that is of most importance to the overarching goals.

When we examine each pilot screen's sensitivity rating (as a function of the BDD, the PSW, and the DSM-5), we note that the Empire State Screen lacks adequate sensitivity to correctly identify individuals who might be LD (rates ranged from 3% to 50%) regardless of the LD determinant. Thus, few persons with LD would be correctly referred for further testing, and thus few people with actual LD would receive needed services. Even though the Empire State Screen did attain a relatively reasonable overall accuracy rate (particularly with the BDD criterion), we cannot recommend the Empire State as a viable option for the purposes of this project, because it does not appear to identify individuals with LD with adequate precision.

In general, the WTW 18 Screen also demonstrated low sensitivity when the LD status determinants were the BDD and the PSW. However, when the LD status determinant was the DSM-5, the WTW 18 Screen demonstrated the highest level of sensitivity, relative to the Empire State Screen and the MATILDA-R. Thus, if the DSM-5 is the determinant considered of primary importance, then we would recommend that the WTW 18 Screen, with the WUS method of scoring (i.e., unweighted total score

with a cut-off of 3 or more points), be utilized.

Of the three screens, the MATILDA-R showed a more consistent pattern of sensitivity across the three methods of determining LD, particularly when the LD status determinant is the PSW (see Table 10). Thus, the MATILDA-R would provide a relatively moderate level of sensitivity across the three LD status determinants depending on the scoring method employed. When we examine the PSW as the criterion, the MATILDA-R was the only measure to provide a reasonable level of sensitivity. Thus, if a clinical interview approach is the preferred method of diagnosing LD, we would recommend the MATILDA-R.

### *Ease-of-Use Considerations*

The three screens were selected because they were relatively easy to administer (about 5 to 15 minutes each), easy to score (e.g., sum the “yes” responses), and easy to interpret (clear cut-off scores). However, there are a few differences that should be noted. Because we cannot recommend the Empire State Screen for the target population, we will not discuss it further in this section.

The WTW Screen has 13 “yes/no” questions that are part of the scoring process. The 13 questions are divided into four sections, and each section is differentially weighted (e.g., sum of Section 1 “yes” responses are multiplied by 1, sum of Section 2 responses multiplied by 2) and summed. The total “yes” responses are compared to the recommended cut-off score. If the individual’s score is below the cut-off score, then the person is considered not at risk for LD. If the individual’s score is at or above the cut-off score, then the person is considered at risk for LD and should be referred for further testing. Based on the findings from the current project, we recommend using the unweighted scoring method (see WUS), with a cut-off score of 3 “yes” responses. That is, for the target population, the number of “yes” responses should simply be summed (without multiplying each section by a constant). If the sum is less than 3, the person is not considered at risk for LD. If the sum is 3 or more “yes” responses, then it is recommended that the person be sent for further testing by an LD specialist. Very little training is required to administer, score, and interpret the WTW 18 Screen. Moreover, because the WTW 18 Screen is already being utilized by CDSS for English-speaking adults enrolled in the CalWORKs program, caseworkers would already be familiar with its use.

The MATILDA-R requires more time to administer and score than the WTW 18 Screen. The scored portion of the MATILDA-R consists of eight “yes/no” background questions and seven “yes/no” math-

related questions. In addition, the MATILDA-R involves the administration of eight tasks that the individual is asked to complete.

To administer the MATILDA-R, two forms are required: 1) The administration form that includes the administrator instructions; and 2) The response form that is used by the individual being tested to write down responses (see Appendix J). Finally, a scoring form is needed to score the examinee's responses (see Appendix K). The "yes" responses are summed and compared to the recommended cut-off score. Based on the findings of the current project (and consistent with the recommendations of the original MATILDA), if the examinee scores below 13 points, the examinee is considered at low risk for LD and further testing is not deemed necessary. If the examinee scores 13 or more points, the individual is considered at risk for LD and can be recommended for further testing by an LD specialist. On average, this process takes about 15 minutes to complete. To optimally administer and score the MATILDA-R, we estimate that approximately 3 to 4 hours of training and practice would be required to correctly administer the MATILDA-R.<sup>19</sup>

## **Suggestions for Improving the Current Screens**

The clinical diagnosis of LD is a complex process that requires two to three days of testing and interviewing by a highly trained LD specialist (typically master's- or PhD-level clinicians). Developing a brief (5-15 minute) screen to accurately predict an individual's LD status is thus difficult. It is therefore not surprising that overall accuracy rates for screens tend to fall in the 70% to 75% range. The overall accuracy rates of the screens considered in the current project generally yielded accuracy rates in the mid-60s to low 70s. It is possible that with modifications the screens tested in this project can be improved upon. We offer a few suggestions for further research.

### ***Refinement of Scoring Process***

It may be possible to improve the precision of the screens by changing the way some questions are worded or scored. For example, the Empire State Screen includes one question that results in somewhat ambiguous responses when answered in yes/no format, "Do you read a lot or only what you have to?" It is unclear if a "yes" response in this instance means that the respondent does read a lot (which would not be indicative of a reading disability) or that the respondent reads only what he/she has to (which

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<sup>19</sup> It is important to note that the original MATILDA is under copyright. The lead researcher and copyright holder, Dr. Grubb, graciously gave CPPR permission to translate, revise, and test the MATILDA-R. Permission to use and distribute the MATILDA-R would need to be obtained by CDSS from the copyright holder.

might be indicative of a reading disability). Regardless of the respondent's actual meaning, the "yes" response contributes to the total score. Changing the question to "Do you only read what you have to read?" would remove the ambiguity and perhaps increase the screen's precision in predicting LD. There are also two questions in the Empire State Screen that, given the demographic characteristics of the target population, may not be applicable. For instance, that screen includes the following statement: "Writing a letter of complaint is easy for me." All of our participants indicated that they had never written a letter of complaint. In part, this may be due to the average low educational attainment of most of our participants and/or because few individuals write letters in our era of emails. Changing the wording of the question to "Writing a letter is hard for me," for instance, may improve the screen's applicability and accuracy.

Scoring the screens typically involves the summation of all "yes" responses (with some exceptions on the Empire State Screen, which differentially weights "yes" and "no" responses [see Materials section]). The MATILDA-R might be improved by reverse scoring two questions, which currently are included as indicative of LD. For example, one "yes/no" question on the MATILDA-R asks, "Do you understand how to work with fractions?" If the respondent answers "yes", the response contributes to the total "yes" responses and increases the probability that the respondent reaches the LD cut-off score and diagnosed as possible LD. Reversing the score (changing it from 1 to 0 coding) might increase the screen's precision.<sup>20</sup>

Changes to a few questions on the WTW 18 Screen might also improve the screen's precision. Because of the low socio-economic status of the target population, some of the questions on the WTW 18 Screen may be confusing to the respondents. For example, one of the questions on the WTW 18 Screen reads, "Do you have difficulty working from a test booklet to an answer sheet?" Few of our participants, as we noted during testing, have ever used test booklets and answer sheets in school. Thus, this question was often confusing and/or not applicable. Changing a few of these types of questions to more accurately reflect the academic experience of the target population might improve the screen's precision.

Other options include examining different weighting procedures for the Empire State Screen and the WTW 18 Screen. In the current project, we followed the recommended weighting procedures of each screen. However, it is possible that the recommended weights may not be optimal for the target population. This can be examined statistically to determine if other weighting options may provide

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<sup>20</sup> Although we stayed true to the original MATILDA scoring in this regard, we note that correlations provided in Appendix L are relevant to the potential statistical effects of the current coding.

increased accuracy.

### ***Developing a Composite Version***

Finally, we suggest consideration of the development of a composite or “hybrid” version. This would involve the statistical analysis of individual items, across the three pilot screens, to identify those items that have the highest association with the criterion (e.g., DSM-5; see Appendix L for screen item correlations). A hybrid test form could be created from the various questions from the MATILDAR, Empire State, and WTW 18 screens in an attempt to maximize accuracy of prediction of LD. A Classification Tree (a type of data mining) approach would be taken to select items. The Classification Tree would be fit to half of the current sample ( $N = 520$ ), selected at random to statistically determine the items and develop a scoring algorithm. This algorithm would then be tested on the remaining half of the sample for validation. Ideally, this hybrid screen would then be administered to a new sample (approximately 300 to 400 participants), who would then be evaluated for LD by a clinical psychologist to further validate the screen and scoring algorithm.

## **CONCLUSION**

The findings of the current project suggest that two screens are viable options for consideration for identifying Spanish-speaking CalWORKs applicants who may benefit from a clinical LD screening: the WTW 18 Screen and the MATILDA-R. The choice of a screen should reflect important factors such as the method of LD diagnosis that will most commonly be employed by clinicians in California in the coming years, the ease with which caseworkers can administer the screen, the cost of completing comprehensive LD screenings on a large number of individuals who do not in fact have a learning disability, and the amount of training necessary for implementation. We strongly recommend that CDSS determine the clinical method most commonly used by LD specialists working with CDSS and that they expect to use in the near future to help make an informed decision as to which screen is the optimal choice. In addition, further research on screen refinement and on a composite screen that pulls the most diagnostically accurate questions from more than one screen could support the development of a more accurate screen.

In the present report, we outlined the pros and cons of each screen and offered suggestions for further refinement and/or development. We are grateful for the opportunity to assist CDSS in its efforts to provide needed services to Spanish-speaking adults with LD in California. Moreover, it is our hope that

we have increased scientific knowledge about a population that is rarely studied empirically, but that, consistent with the American Disabilities Act, is in need of appropriate access to services.

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12. Do you rent or own your home?      \_\_\_ Rent      \_\_\_ Own home
13. Are you currently employed? \_\_\_\_\_
- a. If you are employed, what type of work is it? \_\_\_\_\_
14. What other types of jobs have you held in the past? \_\_\_\_\_
15. How many members in your immediate family live with you? \_\_\_\_\_
16. How many of them are employed? \_\_\_\_\_
- a. [If married or cohabitating] Does your wife/husband/companion work? \_\_\_\_\_
- b. If yes, how many hours per week? \_\_\_\_\_ (**Note:** must be less than 100 hours per month to qualify)
17. Are you or anyone in your immediate family (e.g., husband/wife) receiving any of the following:
- a. Public assistance, such as welfare, food stamps, housing assistance? \_\_\_ Yes \_\_\_ No
- i. If yes, what kind? \_\_\_\_\_
- b. Unemployment insurance? \_\_\_ Yes \_\_\_ No
- c. Disability insurance? \_\_\_ Yes \_\_\_ No
18. Approximately what is your family's annual or monthly income?
- a.  per year/per month

**Eligibility Criteria**

- |   |                |
|---|----------------|
| 1. Must be 18 years +   | ___ Yes ___ No |
| 2. Must have at least one child or currently pregnant                         | ___ Yes ___ No |
| 3. If married/cohabitating, partner must be unemployed or work <100 hrs/month | ___ Yes ___ No |
| 4. Must be a renter   | ___ Yes ___ No |
| 5. Spanish must be dominant language  | ___ Yes ___ No |
| 6. Meet income requirement  | ___ Yes ___ No |
| 7. Must have completed some of their schooling in a Latin-American country    | ___ Yes ___ No |

# APPENDIX B

## DEMOGRAPHIC QUESTIONNAIRE: SPANISH VERSION

### Cuestionario Demográfico

1. ¿Dónde se enteró de este proyecto? \_\_\_\_\_
2. Sexo: Femenino \_\_\_\_ Masculino \_\_\_\_
3. Fecha de nacimiento: \_\_\_\_ / \_\_\_\_ / \_\_\_\_
4. Estado civil: \_\_\_\_ Soltero/a (nunca se casó) \_\_\_\_ Casado/a \_\_\_\_ Separado/a  
 \_\_\_\_ Divorciado/a \_\_\_\_ Viudo/Viuda \_\_\_\_ Unión libre/compañero(a)
5. Lugar de nacimiento: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Ciudad Estado País
  - a. ¿Cuánto tiempo ha vivido en los Estados Unidos? \_\_\_\_\_
6. ¿Qué idioma (s) habla usted? \_\_\_\_\_
  - a. ¿Qué idioma considera su idioma principal o dominante? \_\_\_\_\_
7. ¿Qué tan bien entiende el español?
 

a. Hablado:	Muy bien	Bien	No muy bien	No aplica
b. Escrito:	Muy bien	Bien	No muy bien	No aplica
8. ¿Qué tan bien entiende el inglés?
 

a. Hablado:	Muy bien	Bien	No muy bien	No aplica
b. Escrito:	Muy bien	Bien	No muy bien	No aplica
9. ¿Por cuántos años fue a la escuela? \_\_\_\_\_
  - a. ¿Cuántos de estos años fueron completados en un país Latino? \_\_\_\_\_
10. ¿Qué grado escolar terminó? \_\_\_\_\_
11. ¿Usted tiene hijos o está actualmente embarazada? \_\_\_\_\_
  - a. ¿Cuántos hijos tiene? \_\_\_\_\_
  - b. ¿Cuáles son sus edades? \_\_\_\_\_
  - c. Si son menores de 16 años, ¿Están sus hijos asistiendo a la escuela? \_\_\_\_ Si \_\_\_\_ No \_\_ NA
  - d. Si son menores de 6 años, ¿Están sus hijos inmunizados/vacunados? \_\_\_\_ Si \_\_\_\_ No \_\_ NA
12. ¿Está usted rentando o es dueño de su casa? \_\_\_\_\_

13. ¿Actualmente está trabajando? \_\_\_Si \_\_\_No
- a. Si está trabajando, ¿Qué tipo de trabajo es? \_\_\_\_\_
14. ¿Qué trabajos ha hecho en el pasado? \_\_\_\_\_
15. ¿Cuántas personas de su familia inmediata viven con usted incluyendo a usted? \_\_\_\_\_
16. ¿Cuántos miembros de su familia están empleados? \_\_\_\_\_
- a. ¿Está su pareja trabajando? \_\_\_Si \_\_\_No
- b. Si es así, ¿Por cuántas horas al mes trabaja? \_\_\_\_\_ (Nota: deben ser **menos** de 100 horas de trabajo al mes para calificar)
17. ¿Usted o alguien de su familia inmediata (p. ej. Pareja) está recibiendo alguno de los siguientes beneficios?:
- a. Asistencia pública, por ejemplo *welfare*, estampillas (*Food Stamps*), asistencia pública de vivienda (*housing, section 8*): \_\_\_Si \_\_\_No
- b. ¿Si es así cuál? \_\_\_\_\_
- c. Seguro de desempleo: \_\_\_Si \_\_\_No
- d. Seguro de *deshabilite*: \_\_\_Si \_\_\_No
18. Aproximadamente, ¿Cuáles son los ingresos mensuales o anuales de su familia?
- |       |                          |
|-------|--------------------------|
| _____ | <b>Anuales/Mensuales</b> |
|-------|--------------------------|

**Lista de verificación de elegibilidad** (Nota: si se contesta **NO** en al menos uno de estos criterios, la persona **NO CALIFICA** para el estudio)

1. Debe tener 18 años de edad o más: \_\_\_Si \_\_\_No
2. Debe tener al menos un hijo o estar en estado de embarazo: \_\_\_Si \_\_\_No
3. Si está casado(a) o vive en unión libre, uno de ellos debe estar desempleado o trabajar **menos** de 100 horas al mes: \_\_\_Si \_\_\_No
4. Debe rentar su casa: \_\_\_Si \_\_\_No
5. El español debe ser su idioma dominante: \_\_\_Si \_\_\_No
6. Debe cumplir con los requisitos de ingresos: \_\_\_Si \_\_\_No

# APPENDIX C

## INCOME ELIGIBILITY CHART

### LD Project: Income Eligibility Chart

Date: \_\_\_\_\_ RA Name: \_\_\_\_\_

Participant # \_\_\_\_\_

**Instructions:** When scheduling participants through a community organization (e. g., Head Start), we need to verify income eligibility. If the participant can only give you a yearly amount, just divide by 12 to calculate monthly income. If the participant meets the income criteria, schedule the participant for an appointment. If participants do not meet the income criteria, thank them for their interest, and let them know that they did not meet the income requirement for this study.

**Note:** Income includes salaries, wages, tips, professional fees, and other amounts received as pay for physical or mental work actually performed. Funds received from any other source are not included.

#### Income Calculation:

Participant’s monthly income: \_\_\_\_\_  
 - Subtract \$90 for each family member employed: \_\_\_\_\_  
 = Adjusted monthly income: \_\_\_\_\_

Family Size	Eligibility Income	
	Region 2	Region 1
1	\$504	\$532
2	\$828	\$872
3	\$1,078	\$1,135
4	\$1,282	\$1,347
5	\$1,463	\$1,538
6	\$1,645	\$1,729
7	\$1,804	\$1,900
8	\$1,969	\$2,069
9	\$2,128	\$2,244
10	\$2,317	\$2,436
More than 10	Add \$21 for each extra person	Add \$21 for each extra person

<b>Region One</b>	Alameda	Contra Costa	Los Angeles	Marin
	Monterey	Napa	Orange	San Diego
	San Francisco	San Luis Obispo	San Mateo	Santa Barbara
	Santa Clara	Santa Cruz	Solano	Sonoma
	Ventura			
<b>Region Two</b>	Alpine	Amador	Butte	Calaveras
	Colusa	Del Norte	El Dorado	Fresno
	Glen	Humboldt	Imperial	Inyo
	Kern	Kings	Lake	Lassen
	Madera	Mariposa	Mendocino	Merced
	Modoc	Mono	Nevada	Placer
	Plumas	Riverside	Sacramento	San Benito
	San Bernardino	San Joaquin	Shasta	Sierra
	Siskiyou	Stanislaus	Sutter	Tehama
	Trinity	Tulare	Tuolumne	Yolo
	Yuba			

# APPENDIX D

## EMPIRE STATE SCREEN: SPANISH VERSION (CDSS FORM 2235)

STATE OF CALIFORNIA - HEALTH AND HUMAN SERVICES AGENCY	CALIFORNIA DEPARTMENT OF SOCIAL SERVICES
<b>EVALUACIÓN PRELIMINAR DE EMPIRE STATE: EVALUACIÓN PRELIMINAR DE NECESIDADES RELACIONADAS AL APRENDIZAJE PARA ADULTOS QUE HABLAN ESPAÑOL</b>	
<b>EMPIRE STATE SCREEN: LEARNING NEEDS SCREEN FOR SPANISH-SPEAKING ADULTS</b>	
NOMBRE DEL CLIENTE:	FECHA DE NACIMIENTO:
NÚMERO DE SEGURO SOCIAL:	SEXO: <input type="checkbox"/> MASCULINO <input type="checkbox"/> FEMENINO
<p><i>(Para conseguir información pertinente sobre los antecedentes, se recomienda que el entrevistador(a) haga las siguientes preguntas.)</i>                  (In order to gather relevant background information, it is recommended that the interviewer ask the following questions.)</p>	
1. ¿Usa o alguna vez ha usado lentes? <i>Do you or have you ever worn glasses?</i>	<input type="checkbox"/> SÍ/YES <input type="checkbox"/> NO
2. ¿Usa o alguna vez ha usado un aparato para oír? <i>Do you or have you ever worn a hearing aid?</i>	<input type="checkbox"/> SÍ/YES <input type="checkbox"/> NO
3. ¿Tiene o ha tenido alguna de las siguientes condiciones médicas? (Marque con una "X" todas las que sean pertinentes.) <i>Do you have or have you experienced any of the following medical conditions? (Mark an "X" by all that apply.)</i>	
_____ infecciones múltiples y crónicas de los oídos	
_____ sinusitis crónica	
_____ diabetes	
_____ fiebres altas y prolongadas	
_____ alergias severas	
_____ frecuentes dolores de cabeza	
_____ convulsiones	
_____ abuso de alcohol	
_____ abuso de las drogas	
_____ hipertensión arterial	
_____ enfermedades pulmonares	
_____ otros problemas de salud	
4. ¿Está tomando algún medicamento que pudiera afectar su concentración, atención, o juicio? <i>Are you taking any medications that may affect your concentration, attention or judgment?</i>	<input type="checkbox"/> SÍ/YES <input type="checkbox"/> NO
5. ¿Cuántos años de instrucción formal ha tenido? <i>How many years of formal schooling have you had?</i>	_____
6. En la escuela, ¿ha recibido servicios de educación especial o ha asistido a clases remediadoras/con un tutor? <i>Have you received special education services or remedial/tutorial assistance in school?</i>	<input type="checkbox"/> SÍ/YES <input type="checkbox"/> NO
7. ¿Alguna vez ha tenido que repetir algún grado en la escuela? <i>Did you ever have to repeat a grade in school?</i>	<input type="checkbox"/> SÍ/YES <input type="checkbox"/> NO
8. ¿Hay alguien en su familia inmediata que tiene problemas de aprendizaje? <i>Does anyone in your immediate family have difficulties in learning?</i>	<input type="checkbox"/> SÍ/YES <input type="checkbox"/> NO
<p><b>INSTRUCCIONES:</b> <i>(Instrucciones para el examinador(a): Hágale al cliente cada una de las siguientes preguntas. En las columnas "SÍ" o "NO", marque con un círculo los números correspondientes para indicar la respuesta del cliente. Vea la página 2.)</i></p> <p><b>INSTRUCTIONS:</b> <i>(Directions to examiner: Ask the client each of the following questions, and circle the number in the YES or NO column to indicate the client's answer. See page 2.)</i></p>	
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STATE OF CALIFORNIA - HEALTH AND HUMAN SERVICES AGENCY

CALIFORNIA DEPARTMENT OF SOCIAL SERVICES

**EVALUACIÓN PRELIMINAR DE EMPIRE STATE: EVALUACIÓN PRELIMINAR DE NECESIDADES RELACIONADAS AL APRENDIZAJE PARA ADULTOS QUE HABLAN ESPAÑOL**  
**EMPIRE STATE SCREEN: LEARNING NEEDS SCREEN FOR SPANISH-SPEAKING ADULTS**

NOMBRE DEL CLIENTE:	FECHA:
NÚMERO DE IDENTIFICACIÓN:	EXAMINADOR(A):

**(Instrucciones para el cliente:** "Esta encuesta trata de sus experiencias en el hogar, escuela, y empleo. Por favor conteste "SÍ" o "NO" para cada pregunta y trate de ser lo más honesto y preciso que pueda.")

**(Directions to client:** "This survey is about your experiences at home, school, and work. Please answer "yes" or "no" to each question, and try to be as honest and accurate as you can.")

	<u>SÍ/YES</u>	<u>NO</u>
1.* ¿Alguna vez ha tenido una lesión en la cabeza? <i>Have you ever had a head injury?</i>	0	116
2.* ¿Alguna vez ha participado en orientación individual o en grupo por problemas emocionales? <i>Have you ever participated in individual or group counseling for emotional problems?</i>	0	95
3.* ¿Tiene problemas para dividir números? <i>Do you have problems dividing numbers?</i>	171	0
4.** Cuando era niño, ¿inviertió letras o números? <i>Did you reverse letters or numbers as a child?</i>	130	0
5.** ¿Se pierde en edificios grandes, centros comerciales, o lugares de estacionamiento? <i>Do you get lost in large buildings, shopping malls, or parking lots?</i>	0	127
6.** ¿Tuvo dificultad para aprender las tablas de multiplicar? <i>Did you have difficulty learning multiplication tables?</i>	107	0
7.** ¿Lee mucho o solamente lo que tiene que leer? <i>Do you read a lot or only what you have to?</i>	85	0

**Piense en sus experiencias de la escuela y de la vida. Dígame cómo lo siguiente aplica a usted.**

8.*** En la escuela, siempre terminaba mi trabajo a tiempo. <i>In school I always finished my work on time.</i>	0	113
9.*** Soy bueno en seguir instrucciones. <i>I am good at following directions.</i>	0	133
10.*** Es fácil para mí escribir una carta sobre una queja. <i>Writing a letter of complaint is easy for me.</i>	104	0
11.*** Es fácil leer y completar formularios para el empleo. <i>It is easy to read and fill out forms for work.</i>	0	72

(Sume los resultados para la columna "SÍ" y la columna "NO" por separado.)  
*(Sum up the scores from the YES column and the NO column separately.)*

(Sume el resultado de la columna "NO" con el resultado de la columna "SÍ".)  
*(Add the score from the NO column to the score from the YES column.)*

(Reste 614 del resultado para obtener el resultado total final.)  
*(Subtract 614 from score to get the final total score.)*

**TOTAL**

(¿Es el resultado total más de 50? Si es así, refiera al cliente para una evaluación adicional.)  
*(Is the total score > 50? If so, refer for further testing.)*

	+	
=		
-	614	
=		

\* Translated from the Cooper Screening of information Processing (Cooper, 2000)

\*\* Translated from the Adult Learning Disability Screening (Mallard, 2000)

\*\*\* Translated from the Initial Screen (California Community Colleges, 1999)

**"Basado en y adaptado de la evaluación preliminar de Empire State con permiso otorgado por la Oficina Estatal de Nueva York de Asistencia Temporal y Asistencia para Incapacidades/Discapacidades.**

**"Based upon and adapted from the Empire State Screen with permission granted from the New York State Office of Temporary and Disability Assistance."**

# APPENDIX E

## EMPIRE STATE SCREEN: ENGLISH TRANSLATION (CDSS FORM 2235)

STATE OF CALIFORNIA - HEALTH AND HUMAN SERVICES AGENCY	CALIFORNIA DEPARTMENT OF SOCIAL SERVICES
<b>EMPIRE STATE SCREEN: LEARNING NEEDS SCREEN FOR SPANISH-SPEAKING ADULTS</b>	
NOMBRE DEL CLIENTE:	FECHA DE NACIMIENTO:
NUMERO DE SEGURIDAD SOCIAL	GENERO: <input type="checkbox"/> HOMBRE <input type="checkbox"/> MUJER
<i>(In order to gather relevant background information, it is recommended that the interviewer ask the following questions):</i>	
1. Do you or have you ever worn glasses?	<input type="checkbox"/> YES <input type="checkbox"/> NO
2. Do you or have you ever worn a hearing aid?	<input type="checkbox"/> YES <input type="checkbox"/> NO
3. Do you have or have you experienced any of the following medical conditions? (Mark an "X" by all that apply)	
_____ infecciones multiples y cronicas de los oidos	
_____ sinusitis cronica	
_____ diabetes	
_____ fiebres altas y prolongadas	
_____ alergias severas	
_____ frecuentes dolores de cabeza	
_____ convulsiones	
_____ abuso de alcohol	
_____ abuso de las drogas	
_____ hipertension arterial	
_____ enfermedades pulmonares	
_____ otros problemas de salud	
4. Are you taking any medications that may affect your concentration, attention or judgment?	<input type="checkbox"/> YES <input type="checkbox"/> NO
5. How many years of formal schooling have you had? _____	
6. Have you received special education services or remedial/tutorial assistance in school?	<input type="checkbox"/> YES <input type="checkbox"/> NO
7. Did you ever have to repeat a grade in school?	<input type="checkbox"/> YES <input type="checkbox"/> NO
8. Does anyone in your immediate family have difficulties in learning?	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>INSTRUCTIONS:</b> <i>(Directions to examiner: Ask the client each of the following questions, and circle the number in the YES or NO column to indicate the client's answer. See page 2.)</i>	
TEMP 2235 (8/09) ENG/SP	PAGE 1 OF 2

STATE OF CALIFORNIA · HEALTH AND HUMAN SERVICES AGENCY

CALIFORNIA DEPARTMENT OF SOCIAL SERVICES

**EMPIRE STATE SCREEN: LEARNING NEEDS SCREEN FOR SPANISH-SPEAKING ADULTS**

NOMBRE DEL CIENTE:	FECHA:
NUMERO DE IDENTIFICACION:	EXAMINADOR/A:

*(Directions to client: "This survey is about your experiences at home, school, and work. Please answer "yes" or "no" to each question, and try to be as honest and accurate as you can.")*

	YES	NO
1.* Have you ever had a head injury?	0	116
2.* Have you ever participated in individual or group counseling for emotional problems?	0	95
3.* Do you have problems dividing numbers?	171	0
4.** Did you reverse letters or numbers as a child?	130	0
5.** Do you get lost in large buildings, shopping malls, or parking lots?	0	127
6.** Did you have difficulty learning multiplication tables?	107	0
7.** Do you read a lot or only what you have to?	85	0
<b>Piense en sus experiencias de la escuela y de la vida. Digame si las frases se refieran a usted</b>		
8.*** In school I always finished my work on time.	0	113
9.*** I am good at following directions.	0	133
10.*** Writing a letter of complaint is easy for me.	104	0
11.*** It is easy to read and fill out forms for work.	0	72

(Sum up the scores from the YES column and the NO column separately)

	=	
--	---	--

(Add the score from the NO column to the score from the YES column)

	+	
--	---	--

(Subtract 614 from score to get the final total score)

	-	614
--	---	-----

**TOTAL**

	=	
--	---	--

(Is the total score > 50? If so, refer for further testing.)

- \* Translated from the Cooper Screening of information Processing (Cooper, 2000)
- \*\* Translated from the Adult Learning Disability Screening (Mallard, 2000)
- \*\*\* Translated from the Initial Screen (California Community Colleges, 1999)

***"Based upon and adapted from the Empire State Screen with permission granted from the New York State Office of Temporary and Disability Assistance."***

# APPENDIX F

## WELFARE-TO-WORK (WTW) 18 CALWORKS LD SCREEN: ENGLISH VERSION

STATE OF CALIFORNIA - HEALTH AND HUMAN SERVICES AGENCY

CALIFORNIA DEPARTMENT OF SOCIAL SERVICES

### LEARNING NEEDS SCREENING

#### Directions for County Worker

1. Before asking the questions on this form, give the client Form WTW 19 (*Learning Needs Screening - Client Copy*) so he or she can read the questions silently as you read them aloud.
2. Before proceeding to the Learning Needs Screening questions on the following pages, read this statement aloud to the client:  
  
**"We are going to ask you questions about your school experiences and your health. Your answers will help us figure out if anything is getting in your way with training and working. Your answers will also help you and your worker develop your Welfare-to-Work plan and decide what services you will need to be successfully employed. It is very important that you answer these questions so that you can be placed in the right kind of Welfare-to-Work activities and get the help and services you may need to succeed."**
3. REFUSAL TO BE SCREENED OR EVALUATED: If the client does not want to be screened, read Form WTW 17 (Waiver of CalWORKs Learning Disabilities Screening and/or Evaluation) to the client and explain the importance of a learning disabilities screening and evaluation. Explain to the client the benefits of a screening and evaluation for learning disabilities. If the client still does not want to be screened or evaluated, have the client sign the form. Give a copy of the form to the client and retain the original in the case file.
4. Ask each of the background questions on page 2.
5. Ask the client each question in sections I, II, III, and IV on page 3.
  - a. Record the client's responses by checking "YES" or "NO."
  - b. Count the number of "YES" responses in each section, then multiply by the number indicated in the section. For example, multiply the number of "YES" responses obtained in Section III by 3. Then enter the result after the equal sign as the subtotal.
  - c. To obtain a total, add the subtotals from sections I, II, III and IV.
  - d. If the total from sections I, II, III, and IV is 12 or more, refer the client for learning disabilities evaluation as soon as administratively feasible.
6. Ask the client each of the supplemental questions on page 4.
  - a. Record the client's responses by checking "YES" or "NO" and filling in the blanks, where appropriate.
  - b. Ask the client to provide any record of previous learning disabilities evaluation, attendance in special education, or medical conditions. If the client appears to have problems obtaining the information, the county will assist the client.
  - c. With the client's written consent (WTW 20), forward the records to the learning disabilities evaluator for consideration.
  - d. Refer the client, as appropriate, to a medical or service provider(s) to address any potential health concerns identified on this page.

**Note:** The Learning Needs Screening tool is not intended to determine the existence of a learning disability. It is only the first step in the evaluation process.

STATE OF CALIFORNIA - HEALTH AND HUMAN SERVICES AGENCY

CALIFORNIA DEPARTMENT OF SOCIAL SERVICES

**LEARNING NEEDS SCREENING**

INTERVIEWER NAME \_\_\_\_\_

INTERVIEW DATE \_\_\_\_\_

**BACKGROUND INFORMATION**

CLIENT NAME \_\_\_\_\_ BIRTH DATE \_\_\_\_\_

SEX \_\_\_\_\_ COUNTY \_\_\_\_\_  
 MALE     FEMALE

SOCIAL SECURITY NUMBER \_\_\_\_\_ COUNTY CASE NUMBER \_\_\_\_\_

HIGHEST GRADE COMPLETED (K THROUGH 18) \_\_\_\_\_

HIGHEST LEVEL OF SCHOOLING, INCLUDING CERTIFICATED PROGRAMS, TRAINING APPRENTICESHIPS, ETC. *(Check all that apply):*  
 HIGH SCHOOL DIPLOMA     GED     TECHNICAL/VOCATIONAL     AA DEGREE     OTHER (SPECIFY): \_\_\_\_\_

WHAT KIND OF JOB WOULD YOU LIKE TO GET?  
 \_\_\_\_\_  
 \_\_\_\_\_

HAVE YOU WORKED IN THIS FIELD OR A RELATED FIELD?  
 \_\_\_\_\_  
 \_\_\_\_\_

WHAT MAKES IT HARD FOR YOU TO GET OR KEEP THIS KIND OF JOB (OR ANY JOB)?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

WHAT WOULD HELP YOU FIND OR KEEP A JOB?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**LEARNING NEEDS SCREENING**

<b>SECTION I</b>	<b>YES</b>	<b>NO</b>
1. Have you had any problems learning in middle school or junior high? .....	<input type="checkbox"/>	<input type="checkbox"/>
2. Do you have difficulty working from a test booklet to an answer sheet? .....	<input type="checkbox"/>	<input type="checkbox"/>
3. Do you have difficulty or experience problems working with numbers in a column? .....	<input type="checkbox"/>	<input type="checkbox"/>
4. Do you have trouble judging distances? .....	<input type="checkbox"/>	<input type="checkbox"/>
5. Do any family members have learning problems? .....	<input type="checkbox"/>	<input type="checkbox"/>
Count the number of "YES" answers for Section I _____ X 1 = <u>0</u> Subtotal for Section I		

<b>SECTION II</b>	<b>YES</b>	<b>NO</b>
6. Have you had any problems learning in elementary school? .....	<input type="checkbox"/>	<input type="checkbox"/>
7. Do you have difficulty or experience problems mixing mathematical signs (+/x)? .....	<input type="checkbox"/>	<input type="checkbox"/>
Count the number of "YES" answers for Section II _____ X 2 = <u>0</u> Subtotal for Section II		

<b>SECTION III</b>	<b>YES</b>	<b>NO</b>
8. Do you have difficulty or experience problems filling out forms? .....	<input type="checkbox"/>	<input type="checkbox"/>
9. Did you experience difficulty memorizing numbers? .....	<input type="checkbox"/>	<input type="checkbox"/>
10. Do you have difficulty remembering how to spell simple words you know? .....	<input type="checkbox"/>	<input type="checkbox"/>
Count the number of "YES" answers for Section III _____ X 3 = <u>0</u> Subtotal for Section III		

<b>SECTION IV</b>	<b>YES</b>	<b>NO</b>
11. Do you have difficulty or experience problems taking notes? .....	<input type="checkbox"/>	<input type="checkbox"/>
12. Do you have trouble adding or subtracting small numbers in your head? .....	<input type="checkbox"/>	<input type="checkbox"/>
13. Were you ever in a special program or given extra help in school? .....	<input type="checkbox"/>	<input type="checkbox"/>
Count the number of "YES" answers for Section IV _____ X 4 = <u>0</u> Subtotal for Section IV		

---

If total is 12 or more, refer for further evaluation. ....                      TOTAL

---

---

**LEARNING NEEDS SCREENING**

---

**EDUCATION:**

14. Were you ever in special education classes in school? .....  YES  NO
15. Have you ever been diagnosed or told you have Learning Disabilities? .....  YES  NO  
If YES, by whom? \_\_\_\_\_ When? \_\_\_\_\_
16. Have you ever been diagnosed or told that you have Attention Deficit Disorder with or without hyperactivity? .....  YES  NO  
If YES, by whom? \_\_\_\_\_ When? \_\_\_\_\_

**GLASSES:**

17. Do you need or wear glasses or contacts? .....  YES  NO
18. Was your last vision test within the last two years? .....  YES  NO

**HEARING:**

19. Do you need or wear a hearing aid? .....  YES  NO
20. Have you had your hearing tested in the last 12 months? .....  YES  NO

**SPEECH:**

21. Have you ever seen a speech or language therapist? .....  YES  NO

**MEDICAL/PHYSICAL:**

22. Have you ever had any of the following:
- a lot of ear infections .....  YES  NO
  - a lot of sinus problems .....  YES  NO
  - high fevers that lasted a long time .....  YES  NO
  - diabetes (high blood sugar) .....  YES  NO
  - severe allergies .....  YES  NO
  - a lot of headaches or migraines .....  YES  NO
  - a head injury .....  YES  NO
  - convulsions or seizures .....  YES  NO
  - serious health problems .....  YES  NO
23. Are you taking any medications that affect the way you think, act or feel? .....  YES  NO  
If YES, what are you taking? \_\_\_\_\_  
How often? \_\_\_\_\_
24. Do you need medical or follow-up services? .....  YES  NO

County referrals needed/made: \_\_\_\_\_

---

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# APPENDIX G

## WTW 18: SPANISH VERSION

STATE OF CALIFORNIA - HEALTH AND HUMAN SERVICES AGENCY

CALIFORNIA DEPARTMENT OF SOCIAL SERVICES

### EVALUACIÓN PRELIMINAR DE NECESIDADES RELACIONADAS AL APRENDIZAJE

#### Instrucciones para el trabajador del condado

1. Antes de hacer las preguntas en este formulario, dele al cliente el formulario WTW 19 (Evaluación preliminar de necesidades relacionadas al aprendizaje - copia del cliente) para que él o ella pueda leer las preguntas en silencio cuando usted las lea en voz alta.
2. Antes de hacer las preguntas en la "Evaluación preliminar de necesidades relacionadas al aprendizaje", léale al cliente esta declaración en voz alta:

**"Vamos a hacerle unas preguntas acerca de sus experiencias en la escuela y acerca de su salud. Sus respuestas nos ayudarán a determinar si hay algo que se interpone con el entrenamiento y el trabajo. Sus respuestas también le ayudarán a usted y al trabajador encargado de su caso para desarrollar un plan del Programa para la Transición de la Asistencia Pública al Trabajo (conocido en inglés como *Welfare to Work*) y decidir qué servicios va a necesitar para tener éxito en conseguir empleo. Es muy importante que usted responda estas preguntas para que se le pueda colocar en las actividades apropiadas de *Welfare to Work* y pueda recibir la ayuda y los servicios que necesite para tener éxito."**

3. NEGATIVA A SER EVALUADO: Si el cliente no quiere ser evaluado, léale el formulario WTW 17 (Renuncia a la evaluación preliminar y/o evaluación para CalWORKs acerca de las discapacidades específicas del aprendizaje) y explíquele la importancia de estas evaluaciones. Si el cliente todavía no quiere ser evaluado, pídale que firme el formulario. Dele una copia del formulario al cliente y conserve el original en el expediente del caso.
4. Haga cada una de las preguntas de antecedentes en la página 2.
5. Haga cada una de las preguntas en las secciones I, II, III, y IV en la página 3.
  - a. Registre las respuestas del cliente marcando "SÍ" o "NO".
  - b. Cuente el número de respuestas marcadas "SÍ" en cada sección, luego multiplique este número por el número de la sección. Por ejemplo, multiplique por 3 el número de respuestas marcadas "SÍ" en la sección III. Luego anote el resultado como el subtotal al lado del signo de igual.
  - c. Para obtener el total, sume todos los subtotales en las secciones I, II, III y IV.
  - d. Si el total de las secciones I, II, III, y IV es 12 o más, refiera al cliente para una evaluación sobre discapacidades específicas del aprendizaje tan pronto como sea administrativamente posible.
6. Haga al cliente cada una de las preguntas suplementarias en la página 4.
  - a. Registre las respuestas del cliente marcando "SÍ" o "NO" y llenando las partes en blanco, cuando sea apropiado.
  - b. Pídale al cliente que le proporcione cualquier registro de una evaluación previa de discapacidades específicas del aprendizaje, asistencia a educación especial, o condiciones médicas. Si parece que el cliente tiene problemas para obtener la información, el condado le ayudará al cliente.
  - c. Con el consentimiento del cliente (WTW 20), envíe los registros al evaluador de discapacidades específicas del aprendizaje para su consideración.
  - d. Si es apropiado, refiera al cliente a proveedores de servicios médicos para tratar cualquier posible preocupación de salud identificada en esta página.

**Nota:** La intención de la herramienta de evaluación preliminar de necesidades relacionadas al aprendizaje no es determinar la existencia de una discapacidad específica del aprendizaje. Esta herramienta es solamente el primer paso en el proceso de evaluación.

STATE OF CALIFORNIA - HEALTH AND HUMAN SERVICES AGENCY

CALIFORNIA DEPARTMENT OF SOCIAL SERVICES

**EVALUACIÓN PRELIMINAR DE NECESIDADES  
RELACIONADAS AL APRENDIZAJE**

NOMBRE DEL ENTREVISTADOR

FECHA DE LA ENTREVISTA

**INFORMACIÓN SOBRE LOS ANTECEDENTES**

NOMBRE DEL CLIENTE

FECHA DE NACIMIENTO

SEXO

MASCULINO  FEMENINO

CONDADO

NÚMERO DE SEGURO SOCIAL

NÚMERO DE CASO DEL CONDADO

GRADO ESCOLAR MÁS ALTO QUE COMPLETÓ (KINDER AL GRADO 18)

NIVEL MÁS ALTO DE INSTRUCCIÓN, INCLUYENDO PROGRAMAS QUE OTORGAN CERTIFICADOS, APRENDIZAJE POR MEDIO DEL ENTRENAMIENTO, ETC. *(Marque todos los que sean pertinentes)*

DIPLOMA DE PREPARATORIA *(HIGH SCHOOL)*  GED *(Certificado equivalente a graduación de la preparatoria *(high school)*)*  TÉCNICO/ VOCACIONAL  A.A. DEGREE *(Título de una universidad de dos años)*  OTRA *(ESPECIFIQUE):*

¿QUÉ CLASE DE EMPLEO LE GUSTARÍA CONSEGUIR?

¿HA TRABAJADO EN ESTE CAMPO O EN UN CAMPO RELACIONADO?

¿QUÉ LO HACE DIFÍCIL PARA QUE USTED CONSIGA O MANTENGA ESTA CLASE DE TRABAJO (O CUALQUIER TRABAJO)?

¿QUÉ LE PODRÍA AYUDAR A ENCONTRAR O A CONSERVAR UN EMPLEO?

**EVALUACIÓN PRELIMINAR DE NECESIDADES RELACIONADAS AL APRENDIZAJE**

**SECCIÓN I**

**SÍ NO**

- 1. ¿Ha tenido algún problema de aprendizaje en la secundaria (*middle school* o *junior high school*)? . . .
- 2. ¿Tiene dificultad para trabajar de un examen en un folleto a una hoja de respuestas? . . . .
- 3. ¿Tiene dificultad o problemas para trabajar con números en una columna? . . . . .
- 4. ¿Tiene problemas para calcular distancias? . . . . .
- 5. ¿Algún miembro de su familia tiene problemas relacionados al aprendizaje? . . . . .

Cuente el número de respuestas con "Sí" en la Sección I \_\_\_\_\_ X 1 = \_\_\_\_\_ Subtotal Sección I

**SECCIÓN II**

**SÍ NO**

- 6. ¿Ha tenido algún problema de aprendizaje en la escuela primaria? . . . . .
- 7. ¿Tiene dificultad o problemas para combinar los símbolos de matemáticas básicas (+/x)? . .

Cuente el número de respuestas con "Sí" en la Sección II \_\_\_\_\_ X 2 = \_\_\_\_\_ Subtotal Sección II

**SECCIÓN III**

**SÍ NO**

- 8. ¿Tiene dificultad o problemas para llenar formularios? . . . . .
- 9. ¿Tiene dificultad para aprender números de memoria? . . . . .
- 10. ¿Tiene dificultad para recordar cómo deletrear palabras sencillas que usted conoce? . . . .

Cuente el número de respuestas con "Sí" en la Sección III \_\_\_\_\_ X 3 = \_\_\_\_\_ Subtotal Sección III

**SECCIÓN IV**

**SÍ NO**

- 11. ¿Tiene dificultad o problemas para tomar notas? . . . . .
- 12. ¿Tiene problemas para hacer en su cabeza sumas o restas de números sencillos? . . . . .
- 13. ¿Alguna vez estuvo en un programa especial o le dieron ayuda extra en la escuela? . . . . .

Cuente el número de respuestas con "Sí" en la Sección IV \_\_\_\_\_ X 4 = \_\_\_\_\_ Subtotal Sección IV

-----  
Si el total es 12 o más, refiera para más evaluación. . . . . \_\_\_\_\_ TOTAL

**EVALUACIÓN PRELIMINAR DE NECESIDADES RELACIONADAS AL APRENDIZAJE**

**EDUCACIÓN:**

14. ¿Alguna vez estuvo en clases de educación especial en la escuela? .....  SÍ  NO
15. ¿Alguna vez ha sido diagnosticado o le han dicho que tiene una discapacidad específica del aprendizaje? .....  SÍ  NO  
 Si la respuesta es "SÍ", ¿por quién? \_\_\_\_\_ ¿Cuándo? \_\_\_\_\_
16. ¿Alguna vez ha sido diagnosticado o le han dicho que tiene un Desorden de Atención Disminuida con o sin hiperactividad? .....  SÍ  NO  
 Si la respuesta es "SÍ", ¿por quién? \_\_\_\_\_ ¿Cuándo? \_\_\_\_\_

**LENTES:**

17. ¿Necesita o usa lentes o lentes de contacto? .....  SÍ  NO
18. ¿Tuvo su examen de la vista en los últimos dos años? .....  SÍ  NO

**AUDICIÓN:**

19. ¿Necesita o usa un aparato para oír? .....  SÍ  NO
20. ¿Ha tenido un examen de los oídos en los últimos 12 meses? .....  SÍ  NO

**HABLA:**

21. ¿Alguna vez ha ido a un terapeuta del habla o del lenguaje? .....  SÍ  NO

**INFORMACIÓN MÉDICA/FÍSICA:**

22. ¿Alguna vez ha tenido alguno de los siguientes?
- muchas infecciones en los oídos .....  SÍ  NO
  - muchos problemas de la nariz .....  SÍ  NO
  - fiebres altas que duraron mucho tiempo .....  SÍ  NO
  - diabetes (azúcar alta en la sangre) .....  SÍ  NO
  - alergias severas .....  SÍ  NO
  - muchos dolores de cabeza o migrañas .....  SÍ  NO
  - una lesión en la cabeza .....  SÍ  NO
  - convulsiones o ataques .....  SÍ  NO
  - problemas serios de salud .....  SÍ  NO
23. ¿Está tomando algún medicamento que afecta la manera en que piensa, actúa, o siente? ..  SÍ  NO  
 Si la respuesta es "SÍ", ¿qué está tomando? \_\_\_\_\_  
 ¿Con qué frecuencia? \_\_\_\_\_
24. ¿Necesita servicios médicos o de seguimiento? .....  SÍ  NO

Se necesitan/se hicieron referencias del condado: \_\_\_\_\_

# APPENDIX H

## MATILDA-R: MODIFIED ENGLISH VERSION

### MATILDA-R

#### I. Background

Date of Birth: \_\_\_\_\_

Last grade completed: \_\_\_\_\_ Current Occupation: \_\_\_\_\_

Highest grade or educational attainment by mother: \_\_\_\_\_

Highest grade or educational attainment by father: \_\_\_\_\_

**Instruction:** Please respond to the following questions/statements with yes or no.

- |   |   |  |
|---|---|--|
| Y | N | 1. Have either of your parents been diagnosed with a learning disability?          |
| Y | N | 2. Have any of your biological siblings been diagnosed with a learning disability? |
| Y | N | 3. Have any of your biological children been diagnosed with a learning disability? |
| Y | N | 4. Have you been diagnosed with a learning disability?                             |
| Y | N | 5. School was not enjoyable.   |
| Y | N | 6. Reading was not enjoyable.  |
| Y | N | 7. Have you ever failed a subject?   |
| Y | N | 8. Have you ever had to repeat a grade level?                                      |

## II. Primary Skills

1. Instruction: Write the Spanish alphabet in the space provided (letters A through Z).

2. Instruction: Write the numbers 1 through 20 in the space provided.

3. Instruction: Draw the following figures below their names.

1. Circle

2. Square

3. Triangle

4. House

5. Face

6. Car

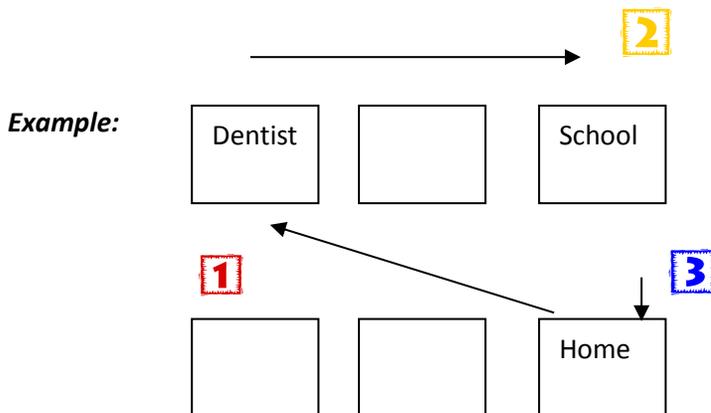
### III. Organizational Skills

Instruction: Please select the route which will allow you to accomplish all three tasks within the specified time.

It is 4:00 p.m. and you are at HOME. You must go to the GROCERY STORE and buy ice cream for your children. You must also go to the DRUG STORE and buy cough medicine for your cold. Your third task is to buy stamps at the POST OFFICE, which closes at 4:30 p.m.

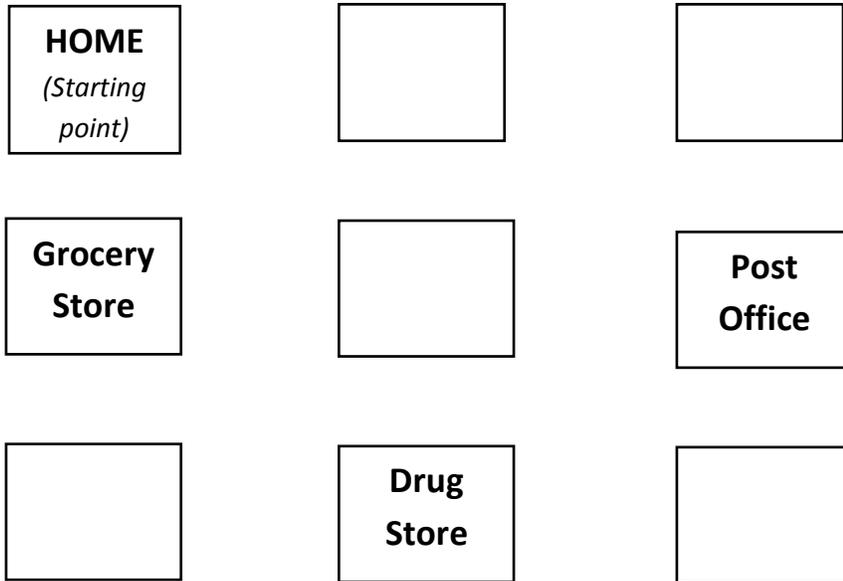
What route would you choose and in what order would you perform these three tasks? Draw an arrow indicating your route and number your stops "1, 2, 3".

Example: I have to go and pick up my children at school at 3:00 pm and go to the dentist at 2:00 pm. Then I need to go home to make dinner.



It is 4:00 p.m. and you are at HOME. You must go to the GROCERY STORE and buy ice cream for your children. You must also go to the DRUG STORE and buy cough medicine for your cold. Your third task is to buy stamps at the POST OFFICE, which closes at 4:30 p.m.

What route would you choose and in what order would you perform these three tasks? Draw an arrow indicating your route and number your stops "1, 2, 3".



#### IV. Auditory Input

Instructions: Listen and write the words that you hear: (hour, now, drink, bed, dog, ice, sky, hard, chicken, bad, hand, glass, green, game)

#### V. Visual Input

Instructions: Copy the following paragraph in the space provided.

Every day after school Maria watched the puppy in the pet store window. It looked like a little ball of fur with eyes. Maria would laugh as the puppy ran around its cage, barking at her. She named the puppy Jorge, after her grandfather. One day Maria went by the pet store and Jorge was gone! She was so sad that she cried all the way home. Maria had a surprise waiting for her at home, though. Her grandfather had bought Jorge for her. The puppy licked her face and made Maria laugh with joy!

1. What is the central theme or topic of the paragraph?

---

2. Who is the main character in this paragraph?

---

## VI. Math Skills

- Y      N      1. Do you have problems adding numbers?
- Y      N      2. Do you have problems subtracting numbers?
- Y      N      3. Do you count on your fingers?
- Y      N      4. Do you have problems multiplying numbers?
- Y      N      5. Do you have problems dividing numbers?
- Y      N      6. Do you understand how to work with fractions?
- Y      N      7. Do you understand how to work with percentages?

Instructions: Solve the following problems and show your work in the space below.

- a.  $3 + 7 =$  \_\_\_\_\_      b.  $18 + 6 =$  \_\_\_\_\_      c.  $102 + 75 =$  \_\_\_\_\_
- d.  $11 - 3 =$  \_\_\_\_\_      e.  $17 - 8 =$  \_\_\_\_\_      f.  $114 - 62 =$  \_\_\_\_\_
- g.  $3 \times 6 =$  \_\_\_\_\_      h.  $11 \times 4 =$  \_\_\_\_\_      i.  $12 \times 13 =$  \_\_\_\_\_
- j.  $12 \div 4 =$  \_\_\_\_\_      k.  $45 \div 5 =$  \_\_\_\_\_      l.  $120 \div 3 =$  \_\_\_\_\_

# APPENDIX I

## MATILDA-R: SPANISH VERSION

### MATILDA-R

#### I. Background

Fecha de nacimiento: \_\_\_\_\_

Último grado completado: \_\_\_\_\_

Ocupación actual: \_\_\_\_\_

Nivel de educación más alto realizado por su madre: \_\_\_\_\_

Nivel de educación más alto realizado por su padre: \_\_\_\_\_

“Por favor responda a las siguientes preguntas/declaraciones con **sí** o **no**.”

- |          |          |  |
|----------|----------|--|
| <b>S</b> | <b>N</b> | 1. ¿Ha sido diagnosticado uno de <b>sus padres</b> con una incapacidad de aprendizaje?                 |
| <b>S</b> | <b>N</b> | 2. ¿Ha sido diagnosticado uno de <b>sus hermanos(as) biológico</b> con una incapacidad de aprendizaje? |
| <b>S</b> | <b>N</b> | 3. ¿Ha sido diagnosticado algún <b>hijo/a biológico</b> con una incapacidad de aprendizaje?            |
| <b>S</b> | <b>N</b> | 4. ¿Ha sido <b>usted</b> diagnosticado(a) con una incapacidad de aprendizaje?                          |
| <b>S</b> | <b>N</b> | 5. La escuela <b>no era</b> agradable. <i>(Agree or disagree)</i>                                      |
| <b>S</b> | <b>N</b> | 6. Leer <b>no era</b> agradable. <i>(Agree or disagree)</i>  |
| <b>S</b> | <b>N</b> | 7. ¿Alguna vez ha fallado una materia en la escuela (por ejemplo Matemáticas)?                         |
| <b>S</b> | <b>N</b> | 8. ¿Alguna vez ha tenido que repetir un nivel de grado?  |

## II. Primary Skills

1. Escriba el alfabeto Español (las letras del A al Z) en el espacio proporcionado
2. Escriba los números del 1 al 20 en el espacio proporcionado
3. Dibuja las siguientes figuras debajo de sus nombres:

1. Círculo
2. Cuadro
3. Triángulo

4. Casa
5. Cara (o Facha)
6. Carro (o Coche)

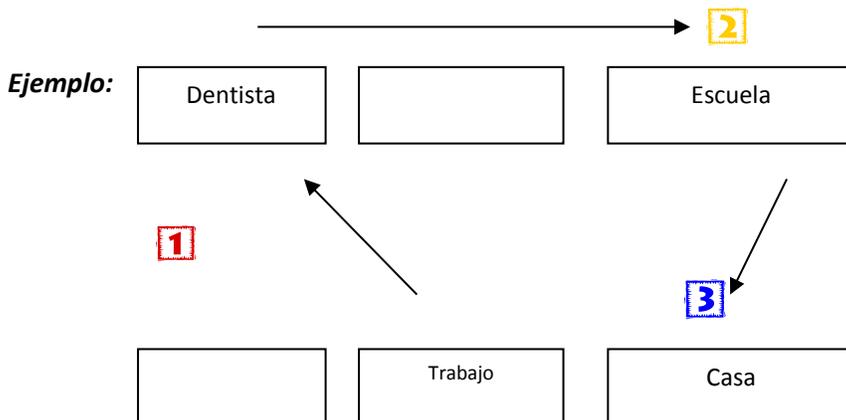
## III. Organizational Skills

Seleccione la ruta que le permitirá completar las tres labores en el tiempo especificado.

“Son las 4 de la tarde y usted está en CASA. Usted debe ir al SUPERMERCADO y comprar nieve para sus hijos. Usted también debe ir a la FARMACIA y comprar medicina para su resfriado. Su tercera labor es comprar estampillas en la oficina de CORREO, que cierra a las 4:30 de la tarde.”

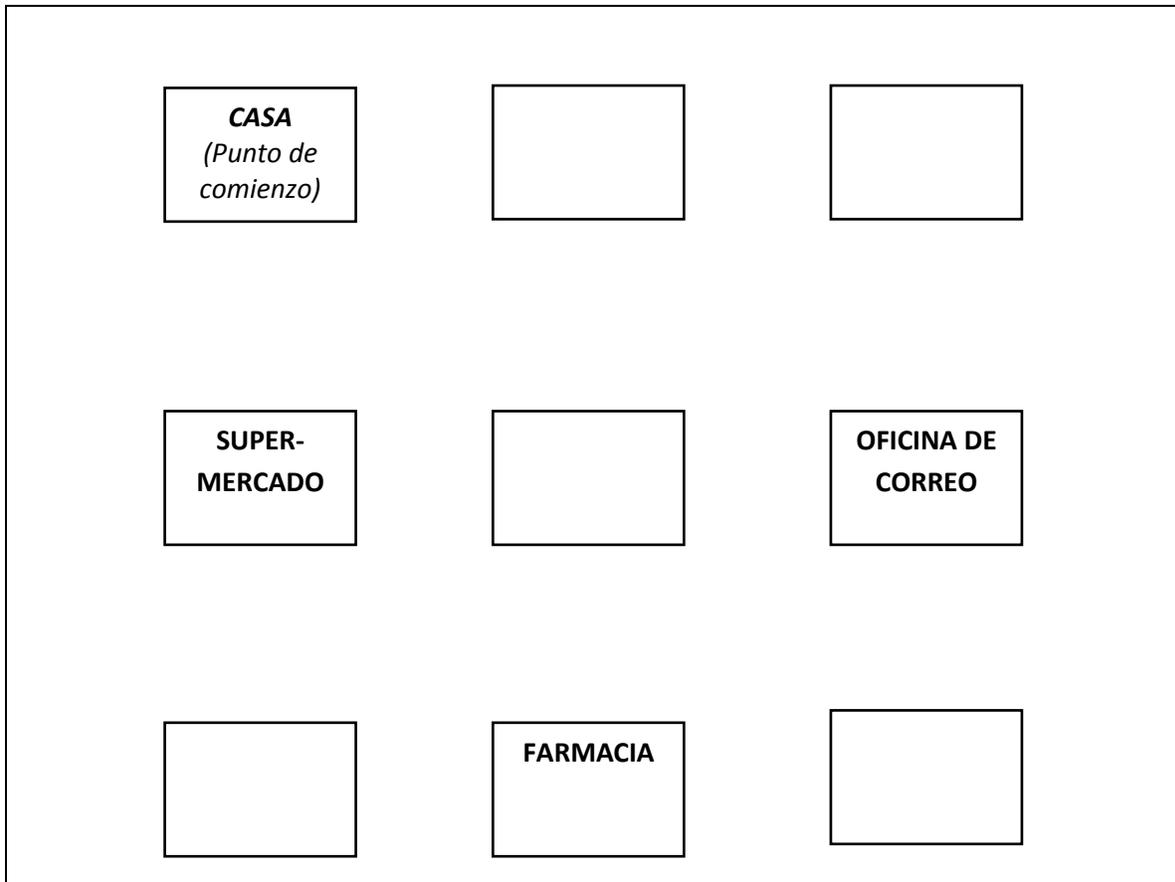
¿Qué ruta escogería y en qué orden cumpliría las tres labores? Dibuje una flecha indicando su ruta y enumere sus paradas “1, 2, 3”.

**Ejemplo:** “Hoy tengo que recoger a mis hijos de la escuela a las 3:00 pm e ir al dentista a las 2:00 pm. Luego, tengo que ir a casa a hacer la cena.



“Son las 4 de la tarde y usted está en CASA. Usted debe ir al SUPERMERCADO y comprar nieve para sus hijos. Usted también debe ir a la FARMACIA y comprar medicina para su resfriado. Su tercera labor es comprar estampillas en la oficina de CORREO, que cierra a las 4:30 de la tarde.”

¿Qué ruta escogería y en qué orden cumpliría las tres labores? Dibuje una flecha indicando su ruta y enumere sus paradas “1, 2, 3”.



#### IV. Auditory Input

“Escuche y escriba la palabra que usted oye. Diré la palabra y luego le daré una oración usando la palabra como ejemplo. Escriba sólo la palabra, no la oración.”

Hora	Por ejemplo: “¿A qué <b>hora</b> es la cita? “
Ahora	“Lo necesito <b>ahora</b> , no mañana.”
Pesar	“Tengo que <b>pesar</b> el paquete antes de ir al correo.”
Bebida	“¿Quiere una <b>bebida</b> ?”
Cama	“Puede dormir en esa <b>cama</b> .”
Perro	“A mi <b>perro</b> le gusta ladrar.”
Hielo	“Necesito <b>hielo</b> para mi limonada.”
Cielo	“No hay estrellas en el <b>cielo</b> esta noche.”
Duro	“Yo trabajo muy <b>duro</b> ”
Pollo	“¿Quiere comer <b>pollo</b> o pescado?”
Malo	“Fumar es <b>malo</b> para usted.”
Mano	“¿Puede darme una <b>mano</b> con esta caja grande?”
Ventana	“¿Puede abrir la <b>ventana</b> ?”
Verde	“El <b>verde</b> es mi color favorito”
Jugar	“¿Quiere <b>jugar</b> al fútbol?”

#### V. Visual Input

Copie el párrafo en el espacio proporcionado

Cada día después de la escuela María miraba al perrito por la ventana en la tienda de animales. Se veía como una pequeña bola de pelo con ojos. María se reía cuando el perrito corría en su jaula. Ella nombró al perrito Jorge, como su abuelo. ¡Un día María pasó por la tienda y Jorge no estaba! Ella estaba tan triste que lloró todo el camino a casa. Sin embargo, María tenía una sorpresa esperándola en casa. ¡Su abuelo le había comprado a Jorge!

1. “¿Cuál es el tema o asunto central del párrafo?”

---

2. “¿Quién es el personaje principal en este párrafo?”

---

## VI. Math Skills

- |   |   |   |
|---|---|---|
| S | N | 1. ¿Tiene usted problemas sumando números?        |
| S | N | 2. ¿Tiene usted problemas restando números?       |
| S | N | 3. ¿Cuenta usted con sus dedos?                   |
| S | N | 4. ¿Tiene usted problemas multiplicando números?  |
| S | N | 5. ¿Tiene usted problemas dividiendo números?     |
| S | N | 6. ¿Entiende usted cómo trabajar con fracciones?  |
| S | N | 7. ¿Entiende usted cómo trabajar con porcentajes? |

Solucione estos problemas de matemáticas y use el espacio debajo de ello si usted tiene que calcularlo.

a.  $3 + 7 =$  \_\_\_\_\_      b.  $18 + 6 =$  \_\_\_\_\_      c.  $102 + 75 =$  \_\_\_\_\_

d.  $11 - 3 =$  \_\_\_\_\_      e.  $17 - 8 =$  \_\_\_\_\_      f.  $114 - 62 =$  \_\_\_\_\_

g.  $3 \times 6 =$  \_\_\_\_\_      h.  $11 \times 4 =$  \_\_\_\_\_      i.  $12 \times 13 =$  \_\_\_\_\_

j.  $12 \div 4 =$  \_\_\_\_\_      k.  $45 \div 5 =$  \_\_\_\_\_      l.  $120 \div 3 =$  \_\_\_\_\_

# **APPENDIX J**

## **MATILDA-R RESPONSE FORM**

### **MATILDA-R**

#### **Participant Response Form**

University of California, Davis

### 3. A. Escriba el alfabeto

### 3.B. Escriba los números del 1 al 20

### 3.C. Dibuje las siguientes figuras

1. Círculo

2. Cuadro

3. Triángulo

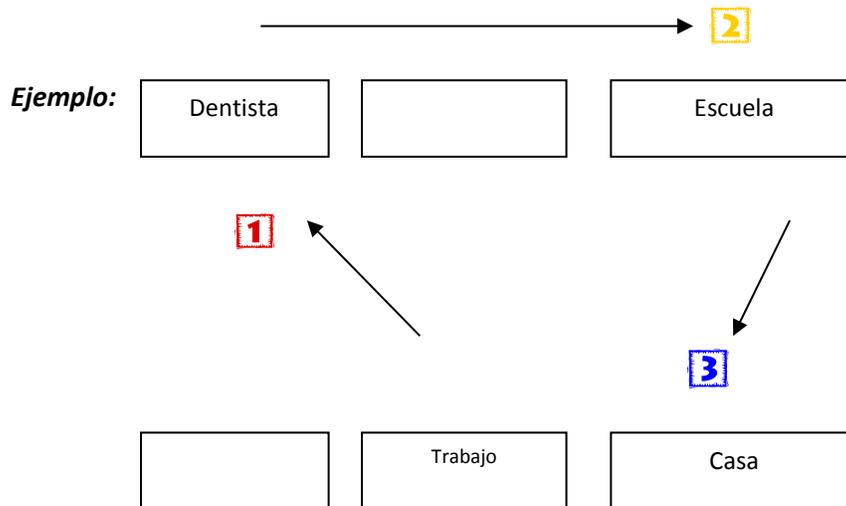
4. Casa

5. Cara (Facha)

6. Carro (Coche)

4. Seleccione la ruta que le permitirá completar las tres labores en el tiempo especificado

**Ejemplo:** “Hoy tengo que recoger a mis hijos de la escuela a las 3:00 pm e ir al dentista a las 2:00 pm. Luego, tengo que ir a casa a hacer la cena.



“Son las 4 de la tarde y usted está en CASA. Usted debe ir al SUPERMERCADO y comprar nieve para sus hijos. Usted también debe ir a la FARMACIA y comprar medicina para su resfriado. Su tercera labor es comprar estampillas en la oficina de CORREO, que cierra a las 4:30 de la tarde.”

¿Que ruta escogería y en qué orden cumpliría las tres labores? Dibuje una flecha indicando su ruta y enumere sus paradas “1, 2, 3”.

<b>CASA</b> <i>(Punto de</i>		
<b>SUPER- MERCADO</b>		<b>OFICINA DE CORREO</b>
	<b>FARMACIA</b>	

5. Escriba las palabras que oye

6. Copie el párrafo en el espacio proporcionado.

Cada día después de la escuela María miraba al perrito por la ventana en la tienda de animales. Se veía como una pequeña bola de pelo con ojos. María se reía cuando el perrito corría en su jaula. Ella nombró al perrito Jorge, como su abuelo. ¡Un día María pasó por la tienda y Jorge no estaba! Ella estaba tan triste que lloró todo el camino a casa. Sin embargo, María tenía una sorpresa esperándola en casa. ¡Su abuelo le había comprado a Jorge!

8. Solucione estos problemas de matemáticas y use el espacio debajo de ello si usted tiene que calcularlo.

a.  $3 + 7 =$  \_\_\_\_\_

b.  $18 + 6 =$  \_\_\_\_\_

c.  $102 + 75 =$  \_\_\_\_\_

d.  $11 - 3 =$  \_\_\_\_\_

e.  $17 - 8 =$  \_\_\_\_\_

f.  $114 - 62 =$  \_\_\_\_\_

g.  $3 \times 6 =$  \_\_\_\_\_

h.  $11 \times 4 =$  \_\_\_\_\_

i.  $12 \times 13 =$  \_\_\_\_\_

j.  $12 \div 4 =$  \_\_\_\_\_

k.  $45 \div 5 =$  \_\_\_\_\_

l.  $120 \div 3 =$  \_\_\_\_\_

# APPENDIX K

## MATILDA MODIFIED SCORING FORM

### MATILDA-R Scoring Form

#### 1. Background

1. How many “yes” responses did the client make to Qs 1-8? \_\_\_\_\_

Section 1: Sum of “yes” and “no” responses \_\_\_\_\_

#### 2. Primary Skills

**Instructions:** Circle any letters omitted; cross out any letters reversed; use arrows for out-of-order errors (Must include the ñ to be correct)

a b c d e f g h i j k l m n ñ o p q r s t u v w x y z

##### A. Alphabet

- |  |     |    |
|--|-----|----|
| 1. Did the client <b>fail</b> to write the <b>majority</b> of the alphabet?<br>(i.e., wrote at least 20 letters) | Yes | No |
| 2. Did the client <b>omit</b> any letters?   | Yes | No |
| 3. Did the client <b>reverse</b> any letters?<br>(e.g., mirror inverted letters)                                 | Yes | No |
| 4. Did the client write any letters <b>out of order /confuse</b> letters?<br>(e.g., “q” for “k”)                 | Yes | No |

##### B. Numbers

**Instructions:** Circle any numbers omitted; cross out any numbers reversed; use arrows for out-of-order errors

1 2 3 4 5 6 7 8 9 10

11 12 13 14 15 16 17 18 19 20

- |  |     |    |
|--|-----|----|
| 1. Did the client <b>fail</b> to write the <b>majority</b> of the numbers?<br>(i.e., wrote at least 15 numbers between 1 and 20) | Yes | No |
| 2. Did the client <b>omit</b> any numbers?   | Yes | No |

3. Did the client **reverse** any numbers?  
(i.e., mirror inverted numbers) Yes No

4. Did the client write any **numbers out of order/confuse** numbers? Yes No

**C. Figures**

1. Did the client **fail** to draw any of the figures? Yes No

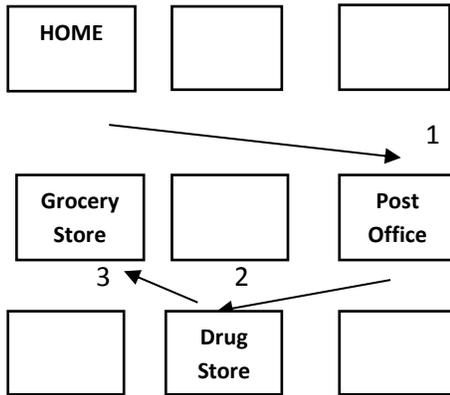
2. Are any of the figures hard to decipher?  
(i.e., Can you **easily** tell it is a circle, square, triangle, house, face, car?) Yes No

**Section 2: Sum “yes” responses** \_\_\_\_\_

**3. Organizational Skills**

1. Did the client **fail** to follow instructions?  
(i.e., failed to **draw lines**, use **numbers** to indicate order) Yes No

**Note:** Do not penalize if client forgot to draw arrow head.



2. Did the client **fail** to choose the appropriate order?  
(i.e., Did client go from home to Post office, to drug store, to store?) Yes No

3. Given the order chosen, did the client **fail** to choose the **most direct route**? Yes No  
(i.e., Regardless of the order, is the route logical?)

**Section 3: Sum of “yes” responses** \_\_\_\_\_

## 4. Auditory Input

**Instructions:** Circle any word misspelled word; Cross out any words omitted

***Hora Ahora Pesar Bebida Cama Perro Hielo Cielo Duro Pollo Malo Mano  
Ventana Verde Jugar***

- |  |                      |
|--|----------------------|
| 1. Did the client <b>misspell</b> any words?<br><i>(Note: does not include letter reversals)</i> | <b>Yes</b> <b>No</b> |
| 2. Did the client <b>reverse</b> any letters?<br><i>(i.e., mirror-like reversals)</i>            | <b>Yes</b> <b>No</b> |
| 3. Did the client <b>omit</b> any words?   | <b>Yes</b> <b>No</b> |

**Section 4: Sum of “yes” responses** \_\_\_\_\_

## 5. Visual Input

**Instructions:** Circle any words misspelled; Cross out any words omitted

*Cada día después de la escuela María miraba al perrito por la ventana en la tienda de animales. Se veía como una pequeña bola de pelo con ojos. María se reía cuando el perrito corría en su jaula. Ella nombró al perrito Jorge, como su abuelo. ¡Un día María pasó por la tienda y Jorge no estaba! Ella estaba tan triste que lloró todo el camino a casa. Sin embargo, María tenía una sorpresa esperándola en casa. ¡Su abuelo le había comprado a Jorge!*

**Total # of Words** = 84

**Punctuation Total** = 12 (periods, commas, exclamation marks); participant should have at least 6 of these.

- |   |                      |
|---|----------------------|
| 1. Did the client <b>misspell any</b> words?<br><i>(Does not include letter reversals)</i>            | <b>Yes</b> <b>No</b> |
| 2. Did the client <b>omit</b> any words   | <b>Yes</b> <b>No</b> |
| 3. Did the client <b>fail</b> to use punctuation?<br><i>(i.e., left out <b>more than 6 total</b>)</i> | <b>Yes</b> <b>No</b> |

- |   |            |           |
|---|------------|-----------|
| 4. Did the client <b>consistently fail</b> to use spacing between words?  | <b>Yes</b> | <b>No</b> |
| 5. Is the client's writing <b>very difficult</b> to read (legibility less than 40)  | <b>Yes</b> | <b>No</b> |
| 6. Did the client <b>fail</b> to identify the main theme?<br>(Theme: <i>Maria and the dog or anything close to that</i> ) | <b>Yes</b> | <b>No</b> |
| 7. Did the client <b>fail</b> to identify the main character?<br>(Main Character: <i>Maria or girl</i> )                  | <b>Yes</b> | <b>No</b> |

Section 5: Sum of "yes" responses \_\_\_\_\_

## 6. Math Skills

### Instructions:

**Question 2:** Does the participant understand/know the basic **mathematical operations** of addition, subtraction, multiplication, and division. A participant who does not understand an operation will miss the **entire** row of that operation. For example, a participant will add, rather than subtract; the participant will multiply, rather than divide. Another possibility is that the participant tells the tester that he/she does not know how to do an operation (can't do division for example). This should be scored as an operation error (i.e., yes to #2). This option applies only when the **entire** row is incorrect or skipped, not just one problem in that row.

**Question 3:** The participant will skip a problem or tell the tester that he/she does not know how to do a problem. The problem may be too hard for the participant to do. If this occurs, this should be scored as a "fail to solve" error (i.e., #3), and not an "operation" error. This option applies only when a **single problem** within a row is skipped.

**Question 4:** This refers to **errors of calculation to completed** problems. Do not include problems that were skipped. This **does** include errors made because the participant misunderstood the operation (e.g., added instead of multiplied).

**Correct Responses:** Circle any problems skipped; cross out any problems incorrectly calculated

### Operation

<b>Addition:</b>	<b>a = 10</b>	<b>b = 24</b>	<b>c = 177</b>
<b>Subtraction:</b>	<b>d = 8</b>	<b>e = 9</b>	<b>f = 52</b>
<b>Multiplication:</b>	<b>g = 18</b>	<b>h = 44</b>	<b>i = 156</b>
<b>Division:</b>	<b>j = 3</b>	<b>k = 9</b>	<b>l = 40</b>

1. How many “yes” responses did the client make to the yes/no questions (1-7): \_\_\_\_\_
  
2. Did the client ***misunderstand/not know*** a mathematical operation **Yes No**  
(i.e. +, -, x, ÷) needed to solve the problem?  
(e.g., added rather than subtracted, multiplied rather than divided?)
  
3. Did the client ***fail*** to solve a problem? (e.g., skipped, could not do at all) **Yes No**
  
4. Did the client make any ***calculation*** errors? **Yes No**  
Only count those that the client actually completed.  
Do not include a skipped problem as an error.
  - i. Number of errors? \_\_\_\_\_

**Section 6: Sum of “yes” responses** \_\_\_\_\_

---

### Number of “Yes” Responses

**Section 1:** \_\_\_\_\_

**Section 2:** \_\_\_\_\_

**Section 3:** \_\_\_\_\_

**Section 4:** \_\_\_\_\_

**Section 5:** \_\_\_\_\_

**Section 6:** \_\_\_\_\_

**Total number of “yes” responses:** \_\_\_\_\_

# APPENDIX L

## LD SCREEN ITEM CORRELATIONS

### Empire State Screen Item Correlations

Empire State Questions	Bateria Discrepancy Diagnosis (BDD)	PSW Diagnosi s	DSM 5 Diagnosi s
Do you wear glasses?	-0.13	-0.06	0.01
Do you wear a hearing aid?	0.04	0.01	-0.02
Do you have, or have had, alcohol abuse?	0.02	-0.01	0.09
Do you have, or have had, severe allergies?	0.00	-0.06	0.00
Do you have, or have had, convulsions?	-0.02	-0.02	-0.01
Do you have, or have had, diabetes?	0.01	0.02	0.04
Do you have, or have had, drug abuse?	-0.03	0.01	0.09
Do you have, or have had, chronic and prolonged fevers?	-0.02	-0.03	0.05
Do you have, or have had, frequent headaches?	0.04	0.02	0.07
Do you have, or have had, hypertension?	-0.03	-0.05	0.00
Do you have, or have had, chronic ear infections?	-0.01	0.01	0.06
Do you have, or have had, other health problems?	-0.01	0.04	0.07
Do you have, or have had, pulmonary problems	0.02	0.00	0.05
Do you have, or have had, chronic sinusitis?	-0.05	-0.02	0.00
Are you taking any medication that can affect your concentration, attention, or judgment?	0.05	0.03	0.06
Have you had special education classes or taken remedial classes with a tutor?	0.02	0.00	0.10
Have you ever had to repeat a grade?	0.07	0.08	0.16
Anyone in your family have learning problems?	0.03	0.03	0.21
Have you ever had a lesion on your head?	0.02	-0.01	0.08
Have you ever participated in individual or group therapy for emotional problems?	0.05	0.00	0.08
Do you have problems dividing numbers?	0.30	0.17	0.16

<b>Empire State Questions (Continued)</b>	<b>Bateria Discrepancy Diagnosis (BDD)</b>	<b>PSW Diagnosi s</b>	<b>DSM 5 Diagnosi s</b>
Did you invert number/letters when you were a child?	0.09	0.04	0.11
Do you get lost in big buildings, commercial centers, or parking structures?	0.00	-0.06	0.10
Did you have difficulty learning the multiplication tables?	0.18	0.07	0.18
Do you read a lot or only what you need to?	-0.04	0.01	-0.08
In school, I always finished my work on time?	-0.12	-0.05	-0.17
I am good at following instructions.	-0.05	-0.03	-0.08
It is easy for me to write a complaint letter.	-0.06	0.01	-0.09
It is easy for me to complete a job application	-0.10	0.04	-0.07

## Washington State Screen Item Correlations

Washington State Questions	Bateria Discrepancy Diagnosis (BDD)	PSW Diagnosi s	DSM 5 Diagnosi s
Have you ever had severe allergies?	0.02	-0.06	0.02
Have you ever had convulsions or attacks?	0.01	0.00	0.04
Have you ever had diabetes?	0.01	0.01	0.03
Have you ever had lots of ear infections?	0.03	0.04	0.03
Have you ever had high fevers that lasted a long time?	0.00	0.01	0.07
Do you need or use glasses or contact lenses?	-0.09	-0.05	0.01
Have you ever had a lot of headaches or migraines?	0.03	0.00	0.06
Have you ever had a head lesion?	0.01	-0.01	0.06
Do you need or use a hearing aid?	0.07	0.00	0.04
Have you had a hearing exam in the last 12 months?	-0.02	0.03	0.05
Do you need medical service follow-up?	0.00	0.05	0.09
Are you taking medications that affect how you think, behave, or feel?	0.01	0.03	0.05
Have you ever had lots of problems with your nose?	0.01	0.02	0.01
Have you ever had serious health problems?	-0.03	0.03	0.12
Have you ever been in a special program or have you been given extra help in school?	0.02	0.00	0.10
Have you ever gone to a speech therapist?	-0.04	-0.04	0.04
Have you had an eye exam in the past two years?	-0.09	-0.01	0.02
Have you ever been diagnosed or told you have Learning Disabilities?	0.03	0.03	0.21
Did you have a learning problem in secondary school?	0.06	0.06	0.37
Do you have difficulty working from a test booklet to an answer sheet?	0.13	0.02	0.14
Do you have difficulty or problems working with numbers in a column?	0.23	0.11	0.12
Do you have problems calculating distances?	0.10	-0.05	0.07
Does a family member have problems related to learning?	0.04	0.00	0.20
Have you had a learning problem in primary school?	0.10	0.08	0.41

<b>Washington State Questions (continued)</b>	<b>Bateria Discrepancy Diagnosis (BDD)</b>	<b>PSW Diagnosi s</b>	<b>DSM 5 Diagnosi s</b>
Do you have difficulty or problems filling out forms?	0.14	0.00	0.08
Do you have problems learning numbers from memory?	0.10	0.06	0.16
Do you have difficulty remembering how to spell simple words that you know?	0.09	0.03	0.09
Do you have difficulty or problems taking notes?	0.13	-0.01	0.07
Do you have problems adding or subtracting simple numbers in your head?	0.21	0.06	0.09
Have you ever been in a special program or have you been given extra help in school?	0.06	0.01	0.14

## MATILDA-R Item Correlations

MATILDA-R Items	Bateria Discrepancy Diagnosis (BDD)	PSW Diagnosis	DSM 5 Diagnosis
Did client fail to write the majority of alphabet (less than 20)?	0.18	0.15	0.01
Did client omit any letters?	0.07	0.08	0.03
Number of letter reversals	0.01	-0.04	-0.03
Did client confuse or out of order letters?	0.15	0.15	0.03
Any misspelled words?	0.16	0.11	0.06
Any reverse letters?	0.06	0.07	-0.01
Did client omit any words?	0.04	0.05	-0.01
Background questions 1-8, number of "yes" responses <sup>2</sup>	0.13	0.11	0.21
Did client fail to draw any of the figures?	0.05	0.00	0.02
Are any of the figures hard to decipher?	0.09	0.14	0.02
Number of "yes" responses to math questions 1-7 <sup>2</sup>	0.30	0.13	0.13
Did client misunderstand/not know mathematical operation?	0.45	0.25	0.12
Did client fail to solve a problem?	0.37	0.19	0.15
Did client make calculation errors?	0.01	0.15	0.09
Did client fail to write the majority of numbers (less than 15)?	0.06	-0.03	-0.03
Did client omit numbers?	0.08	0.00	-0.04
Did client reverse any numbers?	-0.02	-0.01	-0.01
Did client confuse or write numbers out of order?	0.01	0.07	-0.02
Did client fail to follow instructions?	0.05	0.09	0.11
Did client fail to choose correct order?	0.14	0.13	0.08
Did client fail to choose correct route?	0.04	0.04	-0.01
Are there any misspelled words in paragraph?	0.18	0.13	0.12
Did client omit any words in paragraph?	0.11	-0.02	-0.07
Did client fail to use punctuation?	0.19	0.12	0.03
Did client consistently failure to use spacing?	0.15	0.05	0.04
Did client fail to identify main theme?	0.05	0.00	0.03
Did client fail to identify main character?	0.04	0.08	0.05

**Notes:**

<sup>1</sup> The MATILDA-R involves tasks to be completed. These items are not questions (with the exception of items marked with the superscript number 2), but rather the questions used for scoring the MATILDA-R.

<sup>2</sup> These are yes/no questions on the MATILDA-R which are presented separately below

<b>MATILDA-R "Yes" or "No" Questions</b>			
<b>MATILDA-R Background Questions</b>	<b>Bateria Discrepancy Diagnosis (BDD)</b>	<b>PSW Diagnosis</b>	<b>DSM 5 Diagnosis</b>
1. Have either of your parents been diagnosed with a learning disability?	0.08	0.02	0.07
2. Have any of your biological siblings been diagnosed with a learning disability?	0.00	-0.04	0.03
3. Have any of your biological children been diagnosed with a learning disability?	0.02	0.00	0.13
4. Have you been diagnosed with a learning disability?	0.04	0.04	-0.01
5. School was not enjoyable.	0.12	0.03	0.05
6. Reading was not enjoyable.	0.01	0.01	0.07
7. Have you ever failed a subject?	0.13	0.14	0.14
8. Have you ever had to repeat a grade level?	0.07	0.09	0.16

<b>MATILDA-R Math Questions</b>	<b>Bateria Discrepancy Diagnosis (BDD)</b>	<b>PSW Diagnosis</b>	<b>DSM 5 Diagnosis</b>
1. Do you have problems adding numbers?	0.26	0.09	0.07
2. Do you have problems subtracting numbers?	0.29	0.06	0.06
3. Do you count on your fingers?	0.11	0.03	0.08

<b>MATILDA-R Math Questions</b>	<b>Bateria Discrepancy Diagnosis (BDD)</b>	<b>PSW Diagnosis</b>	<b>DSM 5 Diagnosis</b>
4. Do you have problems multiplying numbers?	0.33	0.15	0.20
5. Do you have problems dividing numbers?	0.33	0.21	0.21
6. Do you understand how to work with fractions?	-0.14	-0.09	-0.13
7. Do you understand how to work with percentages?	-0.13	-0.03	-0.07