

National Symposium on Learning Disabilities in English Language Learners

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Workshop Summary

WORKSHOP ORGANIZING SPONSORS:

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Office of English Language Acquisition
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List of Acronyms

ADHD	Attention Deficit Hyperactivity Disorder
BESA	Bilingual Spanish/English Assessment
BI	Bilingual or Spanish-English speakers with intact language skills
CAL	Center for Applied Linguistics
C-TONI	Comprehensive Test of Nonverbal Intelligence
ELL	English Language Learner(s)
ELL/Ds	ELLs in special education programs
EO	English Only or English-Only speakers with intact language skills
ESL	English as a Second Language
IES	Institute for Education Sciences
IFG	Inferior Frontal Gyrus (region of the brain)
IQ	Intelligence Quotient
ITG	Inferior Temporal Gyrus (region of the brain)
L1	first language
L2	second language
LD	Learning Disability or Learning Disabled or English-only speakers with primary language learning delays
LEP	Limited English Proficient or Limited English Proficiency
LI	Language Impairment
MSI	Magnetic Source Imaging
MTG	Medial Temporal Gyrus (region of the brain)
NCLB	No Child Left Behind (Act)
NEA	National Education Association
NICHHD	National Institute of Child Health and Human Development
NIH	National Institutes of Health
OCR	Office of Civil Rights
OELA	Office of English Language Acquisition
OSERS	Office of Special Education and Rehabilitative Services
OT	Occipitotemporal
RD	Reading Disabilities
SMG	Supramarginal Gyrus (region of the brain)
SPED or SpED	Special Education
DARC	Diagnostic Assessment of Reading Comprehension
TONI	Test of Nonverbal Intelligence
WLPB-R	Woodcock Language Proficiency Battery – Revised
WRAT	Wide Range Achievement Test (contains both tests of Reading and Spelling, as two separate tests)

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National Symposium On Learning Disabilities In English Language Learners

Executive Summary

Research on bilingual/multilingual learning in the United States has not kept pace with the increasing growth of our culturally and linguistically diverse population. Nearly one in five Americans speaks a language other than English at home, and almost 45 percent of U.S. teachers have at least one student with limited English proficiency in their classrooms. Schools are striving to meet the mandate of leaving no child behind, despite the challenges associated with teaching students from multiple cultural, linguistic, and experiential backgrounds, including those who are new to the English language, or English language learners (ELL). Additionally, there is the responsibility of determining whether a student's academic difficulties stem from learning a second language or from the presence of a learning disability, or from both. There is widespread anecdotal evidence suggesting that ELL students may be either bypassed for consideration as a child with a disability because teachers assume the child is not achieving solely because of his or her language difference, *or* over-represented on special education rosters due to inappropriate placement based upon inaccurate measures and ill-conceived procedures.

In response to these concerns, three federal agencies jointly organized a National Symposium on Learning Disabilities in English Language Learners, held October 14-15, 2003 in Washington, D.C. The goal of this symposium was to determine how best to apply knowledge about identifying and assessing learning disabilities in native English-speaking students to the identification and assessment of learning disabilities in ELL students. In addition, symposium participants discussed ways to distinguish between actual learning disabilities and the challenges associated with learning a new language. Researchers, practitioners, and policymakers from around the United States, Canada, Mexico, and the United Kingdom joined forces to shape a research agenda that promotes evidence-based practices; is germane to educators; supports the development of valid screening and assessment instruments; and incorporates relevant neurological, cognitive, and linguistic factors.

Key Themes In Workshop Recommendations

Several key themes emerged from the two-day symposium. Participants reinforced the need for stronger theoretical models, better identification and assessment tools, and more consistent terminology. The lack of common terminology, definitions, and models is a hindrance to further research. It is also important to develop a greater understanding of language and literacy development trajectories, as well as the individual and contextual factors that affect education outcomes, including intersections with neurobiology. It was recognized that cross-sectional and smaller studies are needed, in addition to large, longitudinal studies, and that these studies could be undertaken concurrently, especially in school settings.

Cultural competence must be developed among researchers, teachers, and clinicians, to address the myriad cultural and other factors that may limit language acquisition and school success among ELL students. Because ELL students encompass a broad range of backgrounds, abilities, and needs, participants advocated for an expansive or inclusive definition of ELL. These students, like all children, should be viewed from a holistic perspective, not from a "deficit" model. Research goals should include identification and understanding of their adaptive skills, their non-linguistic skills, and their potential under optimal conditions.

1. Identification and Assessment of Language Disability (LD) in the ELL Population

Examine the identification, classification, and definition of LD in the ELL population. Classification research for ELL students with LD is needed, and should replicate the LD classification and identification studies that have been conducted with monolingual students. The study design should be cross-sectional, with sampling at multiple points on the continuum of development. It also should sample students from the lower end of achievement, while more restrictively sampling those from the normative range of achievement for comparison purposes. Data from both cross-sectional and longitudinal studies are needed in order to develop a classification system or model that would provide developmental benchmarks and simplify identification of ELL-LD children. It is also important to develop identification strategies that would improve understanding of the co-morbidities for such conditions as Attention Deficit/Hyperactivity Disorder (ADHD), but would exclude neurological problems and severe emotional disturbances.

Develop better assessment tools. Assessment tools are needed for research, in order to accurately and validly measure student and teacher behaviors, and interactions, as well as the contexts of school, community, and home. In addition, new, accurate, and user-friendly assessment tools must be developed that will help teachers identify language, literacy, and academic competencies in ELL. There is also a need for diagnostic screening tools specifically designed for ELL who are at risk for learning disabilities. Appropriate accommodations for standardized accountability assessments need to be identified, and research is needed to provide evidence indicating when such assessments are appropriate and how well they work. Assessments should be developed that will provide an indication of the linguistic, cognitive, and social skills an ELL student will need in order to succeed in U.S. educational settings.

Explore benefits of using technology in assessment. Readily available and relatively inexpensive access to computers can link linguistically isolated students with assessors and clinicians who can help them. In addition, computers could be used to provide home-language instruction and/or support to students when no native speakers are available in person to provide such support. It is important to explore new software programs that could reduce the cost associated with assessment and language-support.

2. Normal Language and Literacy Developmental Trajectories for ELL

Contrast ELL-LD with normative ELL developmental trajectories. The nature and process of English language acquisition for ELLs must be more fully understood before ELLs with learning disabilities (ELL-LDs) can be reliably identified. More research is needed in the area of normal language and literacy development among monolinguals, bilinguals, and ELLs, as well as research about the relationship between language development and learning disabilities among both monolinguals and ELLs.

Identify impediments to normal development for those who are not disabled. Many ELLs are failing school in the U.S., even though most of them are not learning disabled. The most effective methods for identifying the social, cultural, emotional, instructional, and other issues that impede normal development for ELL children without disabilities must be identified.

Initiate longitudinal studies with multiple cohorts, selected at different points on the developmental continuum. Ultimately, comprehensive longitudinal studies are needed of ELL children, focusing upon the interactions and interrelationships among the child, his/her culture(s), his/her linguistic abilities, and the child's home and school environments. Such research will help to predict outcomes and identify which characteristics and conditions are likely (or unlikely) to produce success in learning. At a minimum, any study of academic achievement and English language acquisition among ELL students should include the following factors: identification of first language, proficiency in first language, type of school instruction received (bilingual, English as a Second Language [ESL], or general education),

language of instruction, observation of instruction, age of the child, language used at home, and specific education outcomes.

3. Individual and Contextual Factors Affecting ELL and ELL-LD Outcomes

Identify salient cultural variables. Research is needed to understand which cultural variables among ELLs correlate to positive or negative educational outcomes. In particular, symposium participants emphasized the need to examine the role of cultural and linguistic factors in the development of American Indian, Alaska Native and Native Hawaiian children; currently, there is a dearth of research on this population. Within the American Indian, Alaska Native and Native Hawaiian community, two major interests are (1) the continued development of a given nation's language and cultural base, as part of the children's heritage, and (2) the relationship of these priorities to each child's cognitive development and academic performance.

Study the role of affective and motivational factors. It is important to understand the roles of affective and motivational factors in academic outcomes for ELLs. What are the roles of parents/family (siblings, grandparents, and extended family), the home environment, and parents' access to information about their child's academic progress?

Place greater emphasis on first language research. Despite the difficulty in studying ELLs' first languages, due to the quantity and diversity of these languages (necessitating a broad sampling for statistical significance), theoretical models must be developed to examine not only a child's English competency, but also his/her first language abilities. Where possible, those languages that can show generalizable patterns for ELL students should be strategically selected in order to develop assessments and interventions that might be useful in multilingual classrooms. Research should seek to identify the conditions under which children are most likely to succeed, and based upon these, interventions may be considered in the first language and/or in English. Intervention in the first language is not always necessary, but it is important to know when and under what conditions it might be advantageous.

Identify school infrastructure factors. It is important to study the quality of instruction, the language of instruction, the types of support available within a child's school, and the efficacy of that support. Do particular school infrastructure factors contribute to successful educational outcomes for ELLs? The most effective types of school structure and support systems for ELL students (i.e., not just curricula and programs) must be identified, and the characteristics of those students for whom these structures or programs work optimally defined. How do environmental factors in and around a school affect ELL outcomes? Since there are so many variations among school environments, it will be necessary to design the research carefully and use a large sample, in order to derive generalizable conclusions.

4. Neurobiology

Apply neurobiology to the study of language and literacy development in ELL students. The neurobiological signature (as reflected by functional neuroimaging) of reading disabilities and the neurodevelopmental trajectories associated with successful reading acquisition are likely to be similar between children who are English language learners and those who are monolinguals. The application of neurobiology to language and literacy development is only at the earliest stages, but it holds great promise for new insights for ELLs, children with LD, and those with normal language development. New functional neuroimaging technology has the potential to provide valuable information about the neurobiological bases for language representation in bilinguals, especially in relation to the age at which a child acquires a second language and whether the acquisition of languages is sequential or simultaneous.

Pursue development of normative data for sequential and concurrent acquisition of first, second, and subsequent languages. The logical next steps for functional neuroimaging research include

developing normative data on spatial-temporal brain activation profiles for various language tasks, in both the first language and additional languages; developing norms for second (or subsequent) language development at successive stages of acquisition for both simultaneous and sequential acquisition; comparing profiles of each constituent operation for first language and second or additional languages; identifying the neurological operations that generate differences between first language and second or additional language profiles; and discovering whether aberrant profiles correspond to particular behavioral or psychological deficits or strengths.

5. Effective Interventions

It is crucial that any effort in this area include (1) demonstrating which interventions are effective, (2) determining the factors that enhance or reduce an intervention's effectiveness, and (3) identifying the types of children for whom particular interventions are most effective. Such research will help to accurately and specifically identify those with various types of learning difficulties. Teachers must not be ignored when collecting data; research should take into account a teacher's knowledge and skills, as well as the requisite linguistic abilities and cultural knowledge a teacher needs in order to engage specific groups and subgroups of children (with and without learning difficulties). Factoring in a teacher's capabilities is as important as knowing which methods and approaches will work, with which children, and in which classroom settings.

Evaluate the efficacy of interventions for ELLs. The efficacy of current clinical and classroom interventions for bilingual, multilingual, and ELL students with learning disabilities must be evaluated. Are the current, research-based instructional programs for monolinguals effective when used with ELLs? What modifications or adaptations are needed, and do these vary by first language or language type? Do students with disorders of basic psychological processes respond differently to intervention than do those without such disorders? For example, would a dyslexic ELL student manifest different symptoms from an ELL student who is not learning simply because of language differences or due to inadequate instruction? As new interventions and instructional approaches are developed for ELL, all must be evaluated for effectiveness.

Identify effective factors in teacher training programs for working with ELL students. It is important to (1) develop effective classroom instruction approaches that best prepare teachers to help ELL and ELL-LD students, and then (2) identify the components of effective pre-service and in-service teacher training, to ensure that teachers have mastered these approaches. What skill sets best equip teachers to engage ELL students in the educational process? What should teachers know, linguistically and culturally, that will best prepare them to deal with a diverse group of students?

Translate classification and intervention to diagnosis and treatment. Real progress will depend upon the ability to apply what is learned from classification and intervention research to the identification and treatment of ELL children with learning disabilities. In order for this to occur, such research must (1) study classroom interventions, (2) monitor implementation, (3) consider and justify control alternatives, and (4) assess and analyze errors made by children in the course of various assessments. Research on assessment, identification of learning difficulties, and intervention development and effectiveness studies should be planned with real world applications in mind.

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I. Introduction

The population of children in the United States who are under 18 years of age is becoming increasingly diverse, both culturally and linguistically. Since 1980, the number of Hispanic children has increased from 9 to 16 percent of the total population, and the number of Asian and Pacific Islander children has doubled, from 2 to 4 percent. By 2020, one in five children is projected to be Hispanic.¹

In the year 2000, 46.9 million, or nearly 20 percent of people 5 years old and older, spoke a language other than English at home, up from 14 percent in 1990. The proportion of people reporting that they spoke English less than “very well” also increased from 6 percent in 1990 to slightly over 8 percent in 2000. Based on information from the Center for Research on Education, Diversity & Excellence, by the year 2030, students whose first language is not English will make up an estimated 40 percent of the K-12 student population in the United States.

The increase in cultural and linguistic diversity among students has been paralleled by an increase in special education enrollment. However, there is a puzzling paradox in the data. There is widespread, informal evidence that English language learner (ELL) students may be inappropriately bypassed for consideration as children with a disability, because teachers assume that the child is not achieving solely because of his or her language difference. Alternatively, other evidence suggests that ELLs may be over-represented on special education rosters, due to inappropriate placements based upon inaccurate measures and ill-conceived procedures.² With the increasing growth of the culturally and linguistically diverse ELL population, our schools are challenged to ensure that the educational needs of all students are met.

To address the challenges of identifying, assessing, and measuring ELL students in the U.S. educational system, the U.S. Department of Education’s Office of Special Education and Rehabilitative Services (OSERS) and the Office of English Language Acquisition (OELA), in conjunction with the National Institute of Child Health and Human Development (NICHD), National Institutes of Health, U.S. Department of Health and Human Services, sponsored a National Symposium on Learning Disabilities in English Language Learners, which was held October 14-15, 2003 in Washington, D.C. Leading researchers, along with selected practitioners and policymakers from around the United States, Canada, Mexico, and the United Kingdom, shared their expertise, experiences, and ideas about assessing learning disabilities in students whose first language is not English. (See Appendix A for the Biosketches of Presenters and Appendix B for the List of Symposium Participants.)

¹ Population Resource Center, 2000, Executive Summary: *Status of Children in America*.

² To Assure the Free Appropriate Public Education of All Children with Disabilities. *Twenty-second Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act*. Washington, DC: U.S. Department of Education. As reported in National Research Council, 2002, *Minority students in special and gifted education*. Committee on Minority Representation in Special Education, Donovan, M. Suxanne and Cross, Christopher T. (Eds.). National Academy Press. Page 454.

The symposium goal was to discuss strategies for how to apply the existing knowledge about identifying and assessing learning disabilities in native English-speaking students to the identification and assessment of learning disabilities in ELL students. Another goal was to distinguish between actual learning disabilities and the challenges associated with learning a new language. The presentations and discussions were designed to help develop a research agenda that will lead to the development of evidence-based practices for instruction and intervention of ELL students with learning disabilities, valid screening and assessment instruments, and interventions that take into account relevant neurological, cognitive, cultural and linguistic factors.

In their introductory remarks, Drs. Maria Hernandez-Ferrier and Joan Mele-McCarthy, representing OELA and OSERS respectively, underscored their Departments' commitment to addressing the needs of ELL students. Both offices are determined to leave no ELL student behind, and they understand the advantages of promoting international collaborations in order to gain important insights. The NICHD representative, Dr. Peggy McCardle, also welcomed participants and described the organizers' intentions to promote a respectful, peaceable exchange, where disagreements could be discussed in a safe environment.

II. The Big Picture: Who and Why?

A. Over- and Under-Referral of English Language Learners for Special Education Programs

Timothy E. D'Emilio, Office of English Language Acquisition (OELA)

Timothy D'Emilio began the symposium by presenting powerful statistics about the growing number of English language learners (ELLs) in the U.S. According to the 2000 Census, nearly one in five Americans speaks a language other than English at home — a surge of nearly 50 percent in the past decade, which has been reflected to a magnified degree in our schools. In 1992, 15 percent of U.S. teachers were estimated to have at least one ELL student in their respective classrooms. Ten years later, in 2002, the percentage of U.S. teachers who had at least one ELL student increased to 43 percent.

To date, little has been published regarding the representation and characteristics of ELLs in special education programs (ELL/Ds). Recently, the Office of English Language Acquisition funded an in-depth study to look at the "state of the ELL student" in America's public schools and to shed light upon the issues that ELL students encounter, especially when these students also are identified as having disabilities. For the first National Symposium, OELA drew identification data from two very different research projects: the OELA Descriptive Study of Services to Limited English Proficient (LEP) Students and LEP Students with Disabilities, and the Office of Civil Rights' (OCR) *2000 Elementary and Secondary School Civil Rights Compliance Report* (or, the OCR Survey).

The two studies combine their different strengths and limitations to present a rough depiction of ELL/Ds in U.S. public schools. The OELA Descriptive Study was conducted in the winter and spring of 2002. The project collected data on ELL student characteristics and services (i.e., curricular alignment, test inclusion, teacher qualifications) through on-site data collection and interviews, as well as case study observations. This rich source of data was based upon a nationally representative sample of schools and school districts across the nation reporting the enrollment of at least one ELL student. In contrast, the OCR Survey was a virtual census of all of the nation's 95,000 K-12 public schools. Although the survey gathered answers to only 12 questions on ELLs, five of which were on ELL/Ds, the information can be disaggregated by school, district, or state.

Data Accessibility: Reporting on findings from OELA's Descriptive Study, Mr. D'Emilio noted that data obtained on ELL/D students were not easily available. Most districts lacked a formal process for identifying and distinguishing between ELL/D students. District personnel repeatedly expressed frustration at not having the tools, procedures, or qualified staff to make this determination. OELA extended the budget and time frame to overcome these difficulties and obtain viable response rates.

Current Identification Procedures: In 70 percent of the 1,315 participating school districts, the routine procedure is to identify struggling ELL students as ELLs first, before they are identified as students with disabilities. In 13 percent of districts, it is estimated that students are typically identified for both ELL and ELL/D services, and in no consistent order in 14 percent of districts. In 2.6 percent of the districts, students routinely were identified for ELL/D services first. This variation in procedures affects the ability to accurately estimate the number of ELL/Ds.

National-Level ELL/D Estimates: Based on data from the OELA Study, it is estimated that there were 357,300 students in K-12 identified as ELL/D during the 2001-2002 school year. This represents 9 percent of all ELL students in U.S. public schools across all grade levels, and 8 percent of all children in special education. (*See discussion of Identification Rates, below.*)

District-Level ELL/D Estimates: A large percentage of the ELL/D student population is enrolled in a very small number of districts. District-level estimates indicate that ELL/D students were enrolled in over 62 percent of approximately 6,500 school districts reporting at least one ELL student in 2002. A solid majority of the districts (55 percent) are estimated to have 10 or fewer ELL/D students. About 3 percent of the districts estimated 500 or more ELL/D students. In other words, future studies on ELL/Ds could be budgeted to focus on fewer than 200 school districts.

School-Level ELL/D Estimates: As with districts, a large percentage of the ELL/D student population is enrolled in a very small number of schools. School-level estimates indicate that ELL students were enrolled in 45,300 schools, and ELL/D students were enrolled in 33,700 of those schools (73 percent). Sixty-two percent of schools enrolling ELL/D students had fewer than 10 ELL/Ds, while nearly 6 percent had 40 or more ELL/D students. In other words, future studies on ELL/Ds could be budgeted to focus upon a universe of approximately 2,000 schools.

Identification Rates: A smaller proportion of ELL students, compared to students in general, were identified for special education services. Both the OELA Descriptive Study and the OCR Survey put the estimate of all students referred to special education at around 13.5 percent, and the number of ELL/Ds at approximately 9.2 percent. Smaller proportions of ELL students than students in general were identified for each of the special education disability categories. (Note, however, the OCR Survey indicates that these proportions vary widely across the states.) Three possible explanations need to be investigated: (1) ELL students may be under-identified nationally as needing special education services; (2) ELLs in special education programs may not be identified as both ELL and ELL/D in district records, but only as ELLs; and (3) There actually may be a lower disability rate among those identified as ELL.

Disability Classifications: The category of "specific learning disability" comprises 56 percent of ELL/D students. The next most common classifications for ELL/D children were speech/language impairments (24 percent), mental retardation (8 percent), and emotional disturbance (2 percent).

Service Provision: ELL/D students were less likely than ELL students in general to receive any ELL services. Services were generally provided entirely in English for more than 56 percent of the ELL/D students in every special education category. Indicators of adequate coordination between Special Education (SPED) and Limited English Proficient (LEP) services were mixed.

Discussion on Delayed Services: Students who enter the public school system speaking a language other than English must be assessed for English language proficiency. If they are identified as ELL or LEP, they then are recommended for placement in a language program to learn both academic content and the English language. Typically, students are reclassified from ELL status in about three years. However, some ELL students struggle more than their ELL peers, either in the acquisition of the language or in mastery of academic content, and do not show typical levels of progress. This delay in learning may concern the teacher, but it was reported that teachers often attribute the slower progress to second language learning instead of attributing it to a disability. In some school districts, if ELL students continue to have difficulty with English and subject-matter achievement beyond the three-year, reclassification mark, they are referred to SPED for further assessment and services. For students who enter the U.S. public school system in first or second grade, the referral for special education services may not occur until the middle elementary grades (4th-6th).

Priority Areas for the Provision of Services: Challenges to correcting the situation for ELL/D students include the lack of qualified teachers and specialists who are trained to work with ELL/D students, as well as the low percentage of training dedicated to ELL/D programs. In addition, ELL/D teacher training, instruction methods, and assessment tools for ELL/D students often do not align with state standards for classroom content and student achievement.

Mr. D'Emilio closed his presentation with three considerations when planning research studies of ELL/D students:

- 1) ELL/D data may be difficult to collect. In the 2001-02 school year, no data systems required districts to record ELL/D numbers. Fortunately, the No Child Left Behind (NCLB) Act is expected to improve data collection, including the process of recording ELL/D numbers, as states move toward student-level accountability systems.
- 2) While a large percentage of the ELL/D student population is enrolled in a very small number of districts and schools, researchers must be prepared to compete for approval to conduct research in large districts. This has become an increasingly difficult and multi-layered task (e.g., in Los Angeles district, approval is required from three distinct levels of government).
- 3) Researchers intending to investigate this topic should be aware that, in general, district and school personnel responsible for ELL/D students are trying to compensate for the lack of specifically-trained personnel by reaching out to specialists and community resources, to create a team approach and improve the identification and placement of ELL students in special education. Some districts report that they recognize that the identification process should include input from persons who are familiar with the students' language and culture. The research community must be able to demonstrate its capability to work with local resources in order to obtain accurate information about ELL/D students.

B. Assessment of English Proficiency for Children Learning English as a Second Language

Gail McKoon, Ph.D., Ohio State University

Dr. McKoon described some of the ongoing findings from the National Literacy Panel for Language Minority Children and Youth, a panel commissioned by the Department of Education. Originally, a part of the panel's mission was to evaluate, on the basis of empirical, scientific research, the quality of the literacy assessments used with language minority children, including children with disabilities, and the appropriateness with which the assessments are used. However, the most salient finding from a review of the last 20 years of empirical studies is that the studies are inadequate in the area of assessment: they

cannot support evaluations of the quality, reliability, or cultural appropriateness of currently available assessment instruments. The lack of research findings points to an urgent need for both researchers and government agencies to make a concerted effort to initiate high-quality studies that identify how best to assess language minority children's language proficiency and literacy.

Dr. McKoon identified several problems with the reviewed studies:

- 1) Even widely used, standardized measures have not been rigorously and thoroughly studied for their validity or reliability with language minority children.
- 2) Many of the reviewed studies involved so few subjects, or examined so few items, that it is impossible to generalize the findings.
- 3) There is no programmatic and/or systematic buildup of research findings.
- 4) For many studies, the conclusions cannot be evaluated, because the items used in the studies' assessment instruments are not available. The number of variables that are potentially relevant to the acquisition of English skills is extremely large. Researchers consistently have failed to describe their test items in terms even of an acceptable subset of these variables. The items themselves are not included in the published articles, so independent evaluation is not possible. Without the items, there can be no replication by other researchers, which is an essential aspect of building systematic, high-quality research.
- 5) Most studies have been conducted without necessary and relevant expertise from other disciplines, especially linguistics and cognitive psychology. Current research from these fields indicates that most, if not all, of the language assessment instruments currently available are, at best, only weakly valid indicators of language skills and abilities, even when they were developed for and used to test English monolingual children. Moreover, research in these fields has enumerated a host of subtle, across-language differences in how proficient native speakers use their own language. Almost none of these were taken into account when developing assessment instruments. It should be stressed that many of these subtle, across-language differences are not apparent to untrained native speakers, nor are they evident to researchers without relevant linguistic expertise.

Dr. McKoon illustrated the need for linguistic expertise, with a study aimed at identifying bilingual language minority children with speech disorders in language production.³ To distinguish these children, their language production abilities were compared to the abilities of children without learning disabilities, both bilingual and monolingual, in both their first language and English. The comparison was carried out with a test in which the children were asked to name aloud pictured objects. A full comparison required that the words to be spoken capture a range of similarities and differences in the phonological and word structures of the first language and English; word lists therefore were constructed only after a careful linguistic investigation of the similarities and differences in fluent adult speech.

The results of this study indicate the importance of (1) measuring language structures both in a child's first language and in English, and (2) comparing them to the structures of fluent monolingual children.

³ Holm, A., Dodd, B. J., Stow, S., & Pert, S., 1999, Identification and differential diagnosis of phonological disorder in bilingual children, *Language Testing*, 16: 271-292.

For non-learning disabled bilingual children, the distributions of speech errors were quite different in each of their two languages; that is, the order of frequency in the types of errors was different in each language. Moreover, the order of frequent errors in English among typically-developing bilingual children was different from the order for typically-developing monolingual children; in addition, the order was different for bilingual children speaking their first language than for monolingual children speaking their first language. These differences showed that the bilingual children in this study had a different structure of phonology for their first language than they did for English, and that both of these structures were different from the structures of monolingual children. Only in the context of these findings, in which ELL students were compared with normally developing monolingual children, could ELLs be identified as having disabilities.

In essence, this research suggests that accurate information can be obtained about a child's speech production abilities only in the context of expert linguistic knowledge, as well as full empirical knowledge of the relevant phonological systems. The probability with which a possibly disabled child makes an error on a randomly chosen word cannot be taken as a measure of his or her general ability to produce English speech; the word might have a particularly difficult phonology in the child's (bilingual) English phonological system. The probability with which an error on the word is made cannot be compared directly to the probabilities of errors for normal monolingual English children, because the difficulty of phonological productions is ordered differently for typically developing monolinguals than typically developing bilinguals.

Dr. McKoon also suggested that, when considering future research on assessment, it is essential to separate out two types of goals: (1) to make practical decisions, such as determining the best possible learning environment for a child and the best possible educational practice in a particular context; and (2) to understand exactly what an ELL child does and does not know about English.

The reason for separating these two types of goals is pragmatic. Ideally, research should provide a collection of assessment measures that allow a detailed and comprehensive characterization of exactly what an ELL knows, including knowledge of all the facets of English – from oral proficiency through orthographic, phonological, morphological, and lexical knowledge, to sentence and discourse comprehension. Research must also measure a child's knowledge of all these facets along a range of developmental points in time, and across a range of abilities and disabilities. Such measures would enable us to develop efficient instructional techniques, both for groups of children and for individuals. However, it is expensive and time-consuming to develop a large collection of demonstrably valid measures for the many aspects of English, and to make those measures applicable across developmental and ability levels. Such an undertaking would require multiple kinds of expertise, and it would need to be replicated across all the minority languages. This could not conceivably be accomplished in a short-term time frame.

A parallel research agenda is to explore the measures, including already existing measures, which allow us to make accurate, practical decisions about educational practices. It should be explicitly recognized that a given measure may allow for accurate decisions – for example, it may facilitate a decision about the best placement for an individual child – even when that measure inaccurately reflects the child's English abilities. That is, the link may be obscure and indirect between what actually is being measured via a particular assessment instrument and a child's actual English ability; nonetheless, the child's score on that instrument still may allow his or her educators to make appropriate decisions. Whether such instruments can be found is an open question, and it is one that may be tractable with large-scale longitudinal studies that include a variety of both predictor and outcome literacy variables.

C. Discussion

There were a number of varied questions and comments in response to the presentations. Researchers may be tempted to rely upon the schools' identification and referral process for information about SPED and

ELL students. However, the Learning Disabled (LD) and ELL definitions and reporting requirements are not consistent across all states. Additionally, the traditional method of comparing a student's Intelligence Quotient (IQ) to academic achievement identifies some, but not all, children in need of special services. Another problem is that schools lack what they need for guidance, such as research evidence, appropriate assessment tools, and adequately trained staff to handle the needs of this population of students.

Several participants were surprised by the recent statistics regarding SPED-LEP students, in terms of both what was and was not reported. Some expressed concerns about the "wait and see" approach, which often delays identification of students in need of ELL and SPED services. There was also concern about the lack of statistics about "former" ELL students, their progress once they have "graduated" from services, and whether many are later reclassified as SPED (meaning that the numbers of SPED-LEP may be initially underestimated). More research is needed regarding the under-representation of ELLs in SPED, as well as the lack of statistics on the number of SPED students who are not native English speakers. It was also pointed out that rural school districts are more likely than urban districts to classify ELL students as SPED.

III. Issues in ELL Measurement and Assessment

The identification of LD is not a simple topic, and debate still rages on the best definition for specific learning disabilities. Identifying LD in ELLs is complicated by the fact that, without culturally and linguistically appropriate assessment tools, it is difficult to determine whether limited language ability in English is interfering with normal learning, or is masking a learning disability. In addition, it is unclear how specific types of learning disabilities (especially language and reading disabilities) will manifest in different languages. In the consideration of this topic, numerous questions were raised: Can ELLs' linguistic precursors to reading (e.g., vocabulary, phonemic awareness, phonological processing in alphabetic languages, etc.) be documented, and if so, are any precursors the same for all languages? If not, can linguistic precursors that are similar within language groups (i.e., alphabetic vs. logographic languages) be described? Can information-processing metrics be used to help determine whether an ELL has an LD? Would it be valuable to include assessments of other indicators of learning, such as working memory, speed of retrieval, and/or executive function?

Panelists were asked to consider these issues by drawing upon their own work and that of others, to address the following questions:

- Based upon the state of the science and currently available assessments (including those that are recently developed or still under development), what are the major issues in reading/language assessment for ELL students?
- What are the major issues regarding the development of new assessments for this group?
- What are the next steps in identifying ELL students with learning disabilities?

A. The Complexities of Comprehension: Assessing Comprehension in Second Language Readers

Diane August, Ph.D., Center for Applied Linguistics

Dr. Diane August shared her research (conducted in collaboration with Dr. David Francis at the University of Houston) on assessing comprehension in second language readers. In order to assess comprehension in Spanish-speaking ELLs, it was necessary to first develop an assessment of reading comprehension (the Diagnostic Assessment of Reading Comprehension (DARC)). The goal of this

instrument was to disentangle decoding skills, language-proficiency skills, and vocabulary skills from other key skills that underlie comprehension, such as working memory and the ability to draw inferences across propositions. This effort was motivated largely by three observations: (1) existing comprehension assessments identify poor readers, but do not isolate the determinants of poor performance; (2) current reading comprehension assessments require good decoding skills and high levels of English proficiency, including a strong vocabulary, which many ELL students lack; and (3) ELL students may have strong inferencing skills and good working memory (key components of comprehension), but their limited English proficiency masks these competencies when reading in English.

Drs. August and Francis developed the DARC for use with elementary school students; the measure is based upon a measure developed by Drs. Brenda Hannon and Meredyth Daneman (University of Toronto at Mississauga) for university students. The DARC uses easily-read texts imbued with complex relationships, in order to measure (1) the background knowledge needed to understand the text, (2) a student's ability to recall information read in text, (3) his or her ability to make inferences based solely upon information provided in the text, and (4) the student's ability to integrate information from the text with his or her existing knowledge.

Dr. August administered the DARC to 30 fifth grade students who scored lowest on the Woodcock Language Proficiency Battery - Revised (WLPB-R) out of a group of 180 Spanish-speaking ELL students who had been followed longitudinally since second grade.⁴ The students were all Spanish-speaking students, had been initially instructed in Spanish through second or third grade, and then had been transferred to English instruction. They were assessed on the DARC in fifth grade. Dr. August's assumption was that some ELL students who had scored poorly on the WLPB-R Passage Comprehension subtest would score better on the DARC.

Results indicated that some of the ELLs who had performed poorly on the standardized test did well on the DARC; they could recall all the newly presented information and make all the required inferences. Others who could remember the newly presented information still had difficulties drawing inferences across propositions, and some students could neither remember the newly presented information nor make inferences across propositions. These findings confirmed the value of a component-oriented assessment battery in explaining performance upon standardized assessments of reading comprehension. It also highlights the value of a comprehension assessment that is easily decoded and for which extensive vocabulary knowledge and background information is unnecessary. The next step is to use the DARC to test native Spanish speakers outside of the United States, as well as native English speakers within the United States, to provide samples against which ELL students can be compared.

B. Identification of Learning Disabilities in Spanish-Speaking English Language Learners

David J. Francis, Ph.D., University of Houston

Dr. David Francis discussed identifying learning disabilities in Spanish-speaking English language learners, and then commented more broadly upon the numerous challenges associated with assessing ELL students in general. What children know in their native language is distinct from what they know in their second language (L2), although there may be some overlap. Since there are "holes" in the current language and concept maps, ELL children must be assessed in both languages. Assessing a child in one of the two (or more) languages gives an incomplete picture of his or her knowledge, skills, abilities, and

⁴ The WLPB-R provides an overall measure of language proficiency and expanded measures of oral language, reading, and written language in both English and Spanish.

instructional needs. Assessment in the second language (L2) can be hindered by the student's failure to fully understand the instructions, despite his or her competence to perform the task in L2. Ideally, instructions should be given in the child's first language (L1).

While testing in both languages is the ideal, it is difficult to find comparable assessments in L1 and in English (as L2). Assessment instruments must assess the same domain of knowledge or skill, and must do so at comparable levels and with comparable precision. Unfortunately, developing high-quality L1 assessments is technically and financially demanding. Even if instruments exist in L1 that are comparable to L2 (English) instruments, finding competent individuals to conduct the assessment is often daunting. Many urban school districts today report over 100 spoken languages among their students. Variations in dialect also can complicate the process of building comparable tests and finding suitable examiners.

As difficult as it is to assess literacy in ELL students, identifying learning disabilities among ELL students is even more difficult. There is very little theoretical and empirical research on the development of academic competencies in ELL students. While support is available for the common models of literacy acquisition across alphabetic languages (e.g., phonological awareness), it is unclear to what degree skills are transferred from L1 to L2. The conditions that affect this transfer are also unclear, as are the effects of instruction and context upon the strength of relationships in the model. There are several domains for which comparable L1 and L2 assessments are being developed, including letter names and sounds; phonemic awareness; rapid naming of letters; timed and untimed word reading; fluency/word reading efficiency (disconnected and connected text); and reading comprehension. However, there are very few effective assessments for children whose first language is not alphabet-based, because it is so difficult to compare non-alphabetic languages to English. Clarifying the relationships between L1 and L2, particularly when L1 is a non-alphabetic language, requires the test developers to conduct explicit cross-linguistic research in order to develop comparable assessments across the languages.

Dr. Francis concluded with the observation that identifying learning disabilities in ELL students requires an understanding of the linkages among theoretical variables of interest, as well as the moderating effects of instruction and context upon these linkages. Additionally, it is imperative to develop comparable assessments in multiple languages. Finally, developers of assessment tools must understand the operational characteristics of the key measures used in identifying ELL-LD.

C. Non-Linguistic Processing Tasks, LD, and Linguistically Diverse Learners

Kathryn Kohnert, Ph.D., University of Minnesota

Dr. Kohnert began by explaining that LD can have many different definitions, depending upon the audience. While many people consider a child with a learning disability to be someone with a normal IQ and perhaps a language or literacy deficit, studies indicate that some children with learning difficulties show the presence of subtle weaknesses in areas of functioning that require little or no language ability. A critical, empirical question is whether the research about non-linguistic deficits among monolingual LD children can help to identify (or rule out) LD among linguistically diverse children. Dr. Kohnert and her colleagues have studied school-aged children, including monolingual English speakers with intact language skills, monolingual English speakers with primary language learning delays, and bilingual Spanish-English speakers with intact language skills. They have used a number of non-linguistic information processing tasks with these children, and have observed that some of these tasks that tap basic, non-linguistic information processing skills are both sensitive and specific to LD in linguistically diverse learners, at least at the group level. Such tasks therefore hold promise as one component in a nonbiased assessment battery.

Dr. Kohnert noted a number of broad empirical questions that need to be addressed in future research. For example, can current findings be extended to additional tasks, language and cultural groups, and ages?

How does performance at the group level predict individual performance? Can the technology used in the experimental setting for clinical purposes be exploited?

D. Invited Responses

Fred Genesee, Ph.D., McGill University, Montreal, Canada

Dr. Genesee agreed that the lack of clarity in such terms as ELL and LD, as well as the paucity of research in normal and impaired language development in monolinguals and multilinguals, pose significant challenges – in particular, regarding the role of language in learning disabilities. It is necessary to differentiate between children who grow up bilingual (e.g., they are exposed to two languages within the first year of life) and those who become English language learners after the age of normal first language development. There are both theoretical and empirical reasons to believe that these two groups develop differently. Normally developing children who are learning a second language often exhibit some of the same difficulties as children struggling with a language disability; thus, it is imperative to have as much normative data as possible to distinguish between normal second language development and second language development under conditions of disability. Truly bilingual children often show the same type and extent of learning impairments as monolingual children who also have language-learning difficulties, and the characteristics of these impairments can be distinct from how ELL students display impairments. More research is needed on preschool- and early elementary school-age children and their development as ELLs. The efficacy of current SPED services for monolingual and multilingual students must be determined. Second-language learning components must also be disentangled from general learning components in research. Lastly, multiple comparisons must be made across diverse groups of children, such as simultaneous vs. second language learners and children with typical and those with impaired capacities for language learning.

Robin Morris, Ph.D., Georgia State University

Dr. Morris reiterated the need to develop standard definitions in the research related to learning disabilities and English language learning, and to capture the heterogeneity of the group. He also questioned whether the way LDs are identified in reading also will apply to learning disabilities in mathematics, and cautioned that even proficient readers may lack oral or written fluency. He remarked upon the difficulties inherent in assessing students whose native spoken language has no written counterpart. Another key issue is the assessment of instructional programs. Researchers should explore the academic and linguistic progress of ELL students after they “graduate” from a school’s ELL services. What types of interventions are children receiving, and how do these children fare when mainstreamed into the regular classroom or when support services (whether bilingual education, L1 support, or English as a Second Language [ESL] services) are discontinued? Another research area is the assessment of bi- or multilingual children and the impact of their previous schooling or lack of formal education. Even children with the same native language background may represent very different learning and cultural characteristics, such as Spanish speakers of Puerto Rican, Mexican, or Spanish origin. Dr. Morris concluded that he is hopeful about new assessment models that allow information to be gathered through non-linguistic means, as well as those that capture the dynamic nature of children’s language learning and may be generalizable.

E. Discussion

While there are not universal benchmarks, some general guidelines exist which use objective criteria for comparing assessment tasks across languages, including measuring the same domain of knowledge and skill by conducting construct validity studies and by having experts review assessments. To compare precision and accuracy, a number of empirical methods may be used, including internal consistency, test/re-test reliability, degree of correlation with other measures, and item-response methods.

There was some discussion of non-linguistic measures. Dr. Kohnert reported that a number of published studies have clearly identified subtle weaknesses in basic non-linguistic information processing skills in monolingual English-speaking children with language impairment (LI) or LD. Studies presented here by Dr. Kohnert extended this literature to the intersection of LI/LD and linguistically diverse learners. The first of these NIH-funded studies are currently in press, with the preparation of other manuscripts underway.⁵ Dr. Morris expressed concern that non-verbal assessment tasks be culturally relevant (i.e., a student who has never played with blocks before would find building figures with blocks a foreign task). However, Dr. Iglesias noted that the results from the Kohnert et al., studies actually spoke against this type of cultural bias, as the typically developing bilingual and monolingual children performed equivalently on the tasks that were not language based, and both groups outperformed the English-only speaking children with LI/LD. Dr. Morris further noted that it is important to account for children with no prior school experience and/or children who have experienced trauma (witnessing war, murder of parents, etc.), and to determine the role these experiences play in any language learning delays the child exhibits. Dr. Margarita Ramos shared that, for the Comprehensive Test of Nonverbal Intelligence (C-TONI) assessment instrument, normative data were collected from Spanish speakers in Mexico; the data were almost identical scores norms for the U.S.

Symposium attendees also expressed concern about the lack of clarity in definitions used in research, and the need for strong theoretical models that facilitate the understanding of language and literacy. Depending upon the metric and definition, the same child may be categorized as a “late talker” at age two, speech/language impaired at age four, language LD at eight, reading disabled at ten, and “slow” by high school age. It is a difficult and “messy” process to analyze the cause of a child’s learning problems, because many factors converge, including his or her non-linguistic abilities. Unlike with students who are bilingual from birth, there is so much variation among ELLs that teachers need to have appropriate skills and tools, in order to recognize patterns of language development in children. Teachers and other adults who are involved with these children need to develop the skills to appropriately refer SPED or LEP students.

There is a significant difference between learning a second language and learning **in** a second language. Dr. Genesee noted that, in the last 20 years, only approximately 50 methodologically sound studies have been conducted on this topic, and inconsistencies in vocabulary and definitions make it difficult to offer valid comparisons across studies. It is also crucial to develop comparable tests across languages.

IV. Cultural Aspects of Assessment

A. How Culture Can Affect Assessment

Lilly Li-Rong Cheng, Ph.D., San Diego State University

Dr. Cheng pointed out that children of immigrants will account for 88 percent of the growth in the under-18 population in the U.S. between 2000 and 2050. She outlined many important aspects of culture, and its impact upon interactions with ELL students and their families. Culture permeates behavior; it dictates customary tasks and activities and can be considered a human form of adaptation to the environment. People in different societies who are confronted with similar challenges may have different palettes of culturally-acceptable solutions to the problems they face. These diverse approaches are influenced by

⁵ Kohnert, K. & Windsor, J, in press, *Journal of Speech, Language, and Hearing Research (JSLHR)*; Windsor, J. & Kohnert, K, in press, *JSLHR*.

culturally-transmitted patterns, which vary with the individual's age, gender, race, religion, geographic region, disability, socio-economic status, language, education, learning style, prior experience, motivation, intelligence, knowledge, and other factors.

Members of a society share the symbols that are emblematic of their culture, which may have a profound impact on their behavior. The meaning and importance of one society's symbols may not be obvious to members of other groups. Another factor to consider is that culture is dynamic, constantly being invented or improved, and often borrowing from other societies. Languages, too, are dynamic, and many people come from multicultural, multilingual backgrounds in which different dialects or languages are spoken. Today there are many "Englishes" spoken among the world's six billion people, two billion of whom speak at least Pidgin English — more than double the number two decades ago. It is important to remember that norms from specific language groups cannot be used with students who are bi- or multilingual or use mixed vernaculars. A variety of linguistic features, such as languages that are non-inflectional, tonal, or logographic, can be found in multilingual/multicultural populations. It is also important to understand nonverbal communication factors, such as the use of movement, gesture, personal "space" and modes of greeting in different languages.

In the classroom, culture affects how learning is organized, how school rules and curricula are developed, and how teaching methods and evaluation procedures are implemented. An understanding of cultural differences can help schools prepare students for effective citizenship in a multicultural world. To succeed with diverse populations of students, professionals must develop cultural competence. This may be defined as a set of congruent behaviors, attitudes, and policies that come together in a system, agency, or group of professionals, enabling them to work effectively in cross-cultural situations. Cultivating cognitive competence requires not only the acquisition of knowledge, but also the development of intellectual skills, such as observing, classifying, measuring, communicating, predicting, inferring, experimenting, formulating hypotheses, and/or interpreting data.

Dr. Cheng outlined areas where inefficiency, delay, or difficulties may indicate language disorders: vocabulary, linguistic structure, speech intelligibility and fluency, oral motor skills, and communication difficulties at home. She described her "**R.I.O.T.**" procedure for assessing ELL students: **Review** all pertinent documents and background information. **Interview** teachers, peers, family members, and other informants. **Observe** the student in multiple contexts with a variety of people. **Test** the student using informal assessment, language samples in both languages, formal assessment battery, and adapted testing procedures as needed.

Dr. Cheng concluded with a number of critical questions: What languages should be used in assessment and/or in intervention? How can parents be involved in addressing the child's needs, and how should parents be informed about a need for special education for their child? She emphasized the importance of taking into account student behavior, temperament, and other personality characteristics in any assessment. Finally, since impairments can overlap considerably, it is imperative to describe a child's problems, not just label them.

William G. Demmert, Jr., Ed.D., Western Washington University

Dr. Demmert quoted from Jerome Bruner to underscore the idea that culture defines the individual: "You cannot understand mental activity unless you take into account the cultural setting and its resources, the very things that give mind its shape and scope. Learning, remembering, talking, imagining: all of them are

made possible by participating in a culture.”⁶ Issues of culture, language, cognition, community, and socialization appear central to learning and to appropriate assessment, and therefore must be adjusted for in the context of learning, social development, identification of learning problems, and theories of education.

He then gave symposium participants a brief communication test involving Native Tlingit petroglyphs and pictographs. No one in the audience could decipher the symbols, but Dr. Demmert could — having grown up in Alaska, with Tlingit oral histories and art forms passed down by his relatives. He assured the audience that they were not cognitively impaired just because they could not read the symbols; they simply lacked the opportunities he had had to develop the skills needed to decipher the images. In a similar way, Native Americans at a 2002 workshop expressed concerns about the lack of culturally-responsive educational evaluations. These concerns centered around context; demographics (statistical information about the lives and academic performance of Native students); whether the Indian’s view of the world was holistic or analytic; the influences of oral traditions; levels of respect between teacher and student; the ever-present influences and effects of abuse, genocide, and policies of oppression on student image and identity; and the value of starting with local knowledge when educating and assessing these students. Dr. Demmert highlighted several important actions that will be important to assessment and service delivery for Native American students. True partnerships must be developed with indigenous people when conducting research, and overcome a history of exclusion regarding control of research and assessment. It is crucial to guarantee that assessment or research activity does no harm to members of the community in question. To do this, the influences of culture and environment on attitudes, perspectives, and cognitive development must first be examined in order to understand the community under study.

In conclusion, Dr. Demmert urged participants to consider seven principles when reviewing cultural factors in assessment:

- 1) Genetics, experiences, and culture significantly influence a person’s cognitive development and understanding of the world in which he or she lives.
- 2) Cultural attributes are not static and evolve across generations.
- 3) Each individual has a different set of intelligences, which may be pre-determined or learned, upon which one can build.
- 4) The context in which information is presented, or in which learning takes place, may enhance or impede a person’s understanding.
- 5) One is not able to understand mental activity unless the cultural settings and resources are taken into account.
- 6) There is much to learn in order to understand all of the nuances of testing and assessing groups outside one’s own spheres of experience.
- 7) The U.S. has an ethical responsibility to develop a true collaboration with indigenous people when conducting research or assessments of Native American students.

B. Discussion

Dr. Cheng reminded participants to “think outside the cultural box” when formulating our research agenda. It is important to capitalize upon children’s cultural strengths in order to create an optimal language learning environment.

⁶ Bruner, J. 1966. *The Culture of Education*. Cambridge, MA & London, England: Harvard University Press, pages x-xi.

There was much discussion about how to preserve Native American languages and what kind of research exists in this area. Dr. Demmert and others expressed concern that Native American students are suffering from low self-esteem and the loss of their heritage languages, because of a lack of research about Native American languages and/or a lack of funding for bilingual programs. It was pointed out that entire communities experience the effects of this language loss, not just the individual students. One participant cited research studies in Minnesota indicating that children on and near the Indian reservation tested similarly to ELL students, even though they spoke English as a first language. Clearly, the “English only” policies were not beneficial to academic performance in this case; although federal legislation does not prohibit bilingual education, some statewide legislation requires “English only” instruction.

V. Assessment/Measurement Instruments to Detect/Predict Problems

It is clear that better measures for screening ELL students for LD at various levels (i.e., screening instruments, more complete assessments) must be developed. These might include at least the following:

- Valid parent questionnaires that provide reliable information about the student’s daily communication skills; such measures could help differentiate between typical versus impaired language in the child’s first language;
- Direct measures of various aspects of language and literacy both in English and in the ELL’s native language.
- Valid checklists for classroom teachers to use in screening for learning difficulties in ELL students;
- Predictive screening tools that would enable teachers and other educators to identify students at risk and/or to monitor L2 learning in ELL students, to allow for earlier intervention; and
- Measures of response to instruction/intervention that might be used as indicators of the presence of learning difficulties in ELL.

Panelists were asked to consider these issues by drawing upon their own work and that of others, in order to address the following questions:

- What issues must be considered in using/developing measures to identify ELL students with learning difficulties?
- What is being/can be done now to identify those students?
- What are the immediate steps that can be taken?
- What are the long-range needs?

A. Assessment of Bilingual Learners

Aquiles Iglesias, Ph.D., Temple University

Dr. Aquiles Iglesias emphasized the great diversity within the population of bilingual Spanish-English speakers in this country. He defined five distinct sub-groups within this bilingual population:

- Monolingual Spanish speakers;
- Spanish first, English second learners;

- English first, Spanish second learners;
- Spanish-English simultaneous learners; and
- English-only speakers from Spanish language cultures — who, he argued, still are not identical in development to monolingual, native English speakers from English speaking cultures.

As Dr. Iglesias noted, bilingual language learning is not always in one direction, as in the case where a child is born in the United States and learns English, moves away for years to another country and learns a different language, then returns to the United States and must learn English again. He also pointed out that language learning is not uni-dimensional. Language loss or attrition in the first language may occur over time, as bilingual learners become more skilled in the second language. Even when learning both languages simultaneously, children do not evenly acquire both languages for the rest of their lives. Therefore, it is important to assess students in terms of typical language and learning trajectories for students similar to them; evidence is lacking on the applicability or usefulness of the language and learning trajectories of monolingual English speaking students to ELL students in the U.S.

To identify bilingual children who are at greatest risk for learning disabilities, Dr. Iglesias tested bilingual children in both English and Spanish and looked at those who fell at least one standard deviation below the mean in both languages. He tested these children with the Bilingual Spanish/English Assessment (BESA) instrument, a static assessment measure that is culturally and linguistically sensitive and geared to identifying language-impaired children. The assessment includes parent and teacher questionnaires, as well as language samples and sections which test phonology, morphology, semantics, and pragmatics. After the struggling students were identified, training interventions were initiated to improve the children's skills. After intervention, dynamic assessments identified children whose skills were not improved with traditional techniques, possibly due to learning disabilities.

B. Assessment of Reading Problems: Two Lessons and a Fortuitous Potential Opportunity

Richard Wagner, Ph.D., Florida State University

In his remarks, Dr. Richard Wagner highlighted the need to identify and intervene early in children's reading problems. Studies of elementary school students indicate the importance of mastering decoding skills before second grade. In addition to phonological awareness, many other factors also may play a role in reading performance: attention, phonological memory, lexical knowledge (vocabulary and spelling strategy), cognitive strategy for doing a task, ability to generate speech/motor output, and willingness to respond when asked.

While it is important to assess preschool-age children's phonological sensitivity, traditional assessment tasks are cognitively complex and are affected by vocabulary knowledge. The solution is to use simple memory tasks that are believed to measure the same underlying phonological ability. Dr. Wagner shared results of several studies of young children, showing the correlation between phonological sensitivity/awareness and phonological memory. He discovered that using an assessment involving non-word repetition has many benefits when testing pre-school children. First, the task is simple, can be used with children as young as two years old, is easily adaptable for ELL students, and can predict vocabulary learning in both first and second languages.⁷ Lastly, this technique identifies children with language

⁷ Gathercole, S.E., Service, E., Hitch, G.J., Adams, A. & Martin, A.J., 1999, Phonological short-term memory and vocabulary development: further evidence on the nature of the relationship, *Applied Cognitive Psychology*, 13: 65-77.

impairments more effectively than do some traditional language measures.⁸ Dr. Wagner presented the specific criteria for creating optimal “non-words,” with respect to the linguistic characteristics of English. He explained that these criteria can be adapted for other languages. The specific criteria make test items less “word-like,” improve scoring reliability, and help to make the task manageable, even for young participants.

C. Assessing ELL Students

Linda Siegel, Ph.D., University of British Columbia, Canada

Dr. Linda Siegel presented her findings from a five-year, longitudinal study designed to determine which screening tools can be used to assess English as a Second Language (ESL) students, and whether teachers can be trained to administer this screening. The study involved all 30 schools in a district with approximately 950 students from varied socio-economic backgrounds, approximately 20 percent of whom were ESL students. All students were assessed in reading ability annually from kindergarten through fourth grade. The researchers measured students’ responses to instruction/intervention, thereby identifying learning disabilities (LD) among ESL students. Another research goal was to determine how students’ language of origin might influence outcomes. The students in this sample spoke a total of 38 different languages.

The teachers in the study were trained to administer a battery of tests examining literacy, phonological awareness, and language skills among kindergarten students. Literacy measures included letter identification (names of letters), word identification (Wide Range Achievement Test of Reading and Spelling [WRAT], Woodcock-Johnson), and simple spelling (dictation). For phonological awareness, five measures were used: rhyme, syllable, and phoneme identification and initial and final phoneme deletion. The final area of assessment (language skills) included oral cloze exercises, as well as memory exercises involving sentence repetition (Stanford-Binet). It is important to note that teachers must receive proper support (e.g., substitute teachers on call to teach the class while they test individual students) in order to successfully implement this very thorough assessment.

At the kindergarten level, teachers were able to classify students into three reader types, both among monolingual English speakers (L1) and among ESL speakers: at risk, borderline, and not at risk. At first assessment, close to 26 percent of L1 and 50 percent of ESL students were identified as at risk or borderline readers. After interventions in kindergarten through fourth grade, less than 6 percent of L1 and less than 7 percent of ESL students were still identified as at risk or borderline readers, with the most change occurring in the two years of kindergarten and first grade. When reading and comprehension measures were compared between L1 and ESL students and between normal and reading children with disabilities, there were striking similarities between language groups but significant disparities between the normal and reading disabled groups of students in both language groups. Although it is important to continue to develop first language assessments, error analysis of difficulties in both the first and second languages can be helpful.

Assessment results reflected the influence of the native language upon reading outcomes. For example, in the word spelling measure, children whose native language was Tagalog, Slavic, Chinese, Japanese, French, or Farsi performed better than native English and native Spanish speakers. In pseudoword spelling, English speakers had the third highest scores and in syntactic awareness, they had the second highest scores, after native Slavic speaking children. This is not unexpected, given the complexity of

⁸ Dollaghan, C.A. & Campbell, T.F., 1998, Nonword repetition and child language impairment, *Journal of Speech, Language, and Hearing Research*, 41: 1136-46.

syntax in English and Slavic languages. These results indicate that each language of origin has a unique impact on the ESL student.

Finally, this assessment model is widely useful, because it can be implemented on a large scale, using trained teachers who can provide feedback about, and interventions for, children at risk.

D. Invited Response

Manuel Barrera, Ph.D., Metropolitan State University

Dr. Barrera reiterated the importance of determining whether students with limited English proficiency have a learning disability or are really experiencing linguistic, cultural, or other types of learning barriers. He emphasized the importance of assessing the learner's current level of English and native language functioning and the consequent need for better validated language assessments.

Based upon his research in this area, Dr. Barrera believes it is vital to have a pre-referral system, to assess ELL children with special needs before they are placed in special education classes. He advocates for using a curriculum-based assessment, which tests students on material they are exposed to in class, as opposed to using standardized tests. Evaluation of assessment results can determine if a student has a great disparity between ability and performance, and whether this difference is the result of a processing problem. Dr. Barrera emphasized the importance of creating linguistically appropriate and culturally relevant assessment tools for ELL students. He pointed out that many assessments emphasize high-functioning language ability in the child's first language and do not provide a measure of the learner's capacity to build and use the native language in the learner's direct linguistic environment. He advocates using more direct classroom-based assessments that provide a measure of how well a learner acquires language and academic skills, based upon observed linguistic and academic capacities and in relation to other learners with similar characteristics. By using a dynamic, curriculum-based assessment process, professionals may be able to make more appropriate comparisons among (1) bilingual students who are proficient in English, (2) students with limited English proficiency, and (3) ELL students who are truly learning disabled.

E. Discussion

A question regarding the use of non-word repetition tasks as a screening measure generated lively discussion about whether there are national norms for pre-school children. This assessment is a component of the Comprehensive Test of Phonological Processes (Pro-ED Publishers), which has national norms starting at age 5, but no norms for pre-school children. A pre-school version of this test currently is being developed.

A participant asked Dr. Siegel how much of the language improvement in students from K-4th grade may have been due to the natural exposure to environmental stimuli, as opposed to specific interventions. She responded that interventions were used with children both inside and outside of the classroom, and that systematic exposure to English is part of the intervention, in addition to story-telling, dramatic play, etc. Participants also discussed the dramatic improvement exhibited by ESL students in her Canadian study.

In response to a specific question about the influence of the family or home upon student outcomes, Dr. Siegel stated that, while not formally studied, anecdotal information gathered from students and parents indicates that there are a number of important influences which are ripe for further examination, such as older children teaching English to younger siblings at home; varying cultural attitudes about the value of literacy; and the involvement of some children in first language schooling on weekends and/or after school.

In the discussion, several important points were raised. Schools need teacher-friendly, standardized, descriptive statements about how ELL students are acquiring English, so they will know when to refer students for assessment and placement. Participants acknowledged the teachers' frustration, but underscored the importance of creating assessment materials based on solid research, not anecdotal information, in order to avoid the pitfall of frequent changes in guidelines. Participants emphasized the need for intensive, out-of-classroom interventions targeted at the approximately 5 percent of students who are "treatment resisters" and who usually can be identified by the end of kindergarten. To be certain there is no learning disability, some participants suggested that interventions should be considered in the first language, not just in the societal language. A child's letter identification ability and understanding of syntax by the end of kindergarten or the beginning of 1st grade may be a reasonable predictor of ELLs who are likely to have subsequent reading problems.

Further discussion centered on whether the age at which language is learned really matters. Recent research indicates that older children and adults can learn languages effectively – suggesting that, contrary to popular belief, although there may be period after which attaining native-like pronunciation is not possible for many individuals, there is *not* a discrete window of second language learning opportunity in early childhood.

VI. Neuroimaging

Recent advances in technology have enabled researchers to document changes in neurophysiological function, including response to reading intervention. This technology has not yet proven to be useful exclusively for the diagnosis of certain conditions, such as reading or other learning disabilities; however, the technology itself and its usefulness in behavioral and educational research have been demonstrated. Thus, it is important to include research on bilingual language abilities and language learning when seeking to identify learning disabilities and their remediation among ELL students.

Panelists were asked to consider these issues by drawing upon their own work and that of others, in order to address the following questions:

- In what ways could functional neuroimaging be applied to the issues of identifying and measuring learning disabilities in ELL students?
- Should investigative efforts be limited to basic behavioral research, before pairing this with neuroimaging technology?
- What types of neuroimaging might best be applied?

A. Early Development and Plasticity of Neurophysiological Processes Involved in Reading

Andrew Papanicoloau, Ph.D., University of Texas-Houston Medical School

Dr. Papanicoloau explained the advantages of Magnetic Source Imaging (MSI) for the study of brain mechanisms of cognitive functions at large. These advantages include direct measurement of neuronal activity, with reliable, valid, and detailed cortical maps that are cognitive operation-specific and truly spatial-temporal. MSI also has advantages for the study of brain development. It is safe and non-invasive, has a quiet recording environment, allows for a child-friendly environment in which the child is not alone, and permits the task to be repeated any number of times.

Dr. Papanicoloau has mapped brain differences between normal readers and dyslexic readers, as well as changes in brain function among dyslexics after treatment intervention. In his study with kindergarten students, he found that those students identified as high risk for a reading disability showed similar brain

map profiles as those identified as dyslexic. He also has undertaken some studies with bilingual individuals. He expressed hope that future language development knowledge could benefit from wider use of MSI and closer scrutiny of brain scans.

B. Using Functional Neuroimaging to Study Learning in Reading

Rebecca Sandak, Ph.D., Haskins Laboratories

Dr. Rebecca Sandak and her colleagues have studied normal brain development through longitudinal and cross-sectional methods, comparing skilled readers with reading disabled populations. She summarized the findings of her own work, that of her colleagues, and others' work on the neural circuitry of reading. Beginning readers activate left hemisphere (LH) temporoparietal and anterior regions (among many others), but do not activate the LH occipitotemporal (OT) areas for reading activities. However, increases in reading skill are associated with increasingly specialized engagement of OT brain areas during reading. Research has found that people with reading disabilities (RD) fail to show this developmental trend. Instead, they activate right hemisphere homologues of the posterior areas and over-activate the LH anterior region, perhaps in an attempt to compensate for their disabilities.

Dr. Sandak reported that successful intervention with individuals who have reading disabilities has been correlated with changes in brain activation. As people became more efficient readers, more rapid word recognition appears to be associated with changes in brain activity. These findings have stimulated further research into how the skill-related shift in cortical activation and specialization of the OT "skill zone" develops, and how the system learns to read new words. The researchers have several hypotheses that remain to be tested, including that the quality of the lexical representations that are established when new words are learned is affected by the type of processing engaged in during learning; more specifically, that attention to phonological and semantic features leads to better learning than does attention to orthographic features, and that better learning leads to more efficient cortical processing.

Recent preliminary experiments have revealed that, for optimal learning, a learner must pay attention to the abstract phonological or semantic features of new words. Additionally, equivalent behavioral facilitation for phonologically and semantically trained items seems to be linked to different underlying processing mechanisms. Only phonological training led to the neural signature associated with increased processing efficiency for familiar words and increased efficiency (relatively reduced activation) in the OT "skill zone." This finding suggests that this important region is phonologically tuned. The question remains as to whether training that emphasizes attending to both phonological and semantic features might result in even better learning than either phonological or semantic training alone. If so, even stronger reductions should be expected in the Inferior Frontal Gyrus (IFG), Supramarginal Gyrus (SMG), and OT areas of the brain. Dr. Sandak shared some preliminary results from a second study examining this question. Early findings suggest that the best learning and neurobiological profile is associated with attending to both phonological and semantic features.

By studying skilled readers, functional neuroimaging researchers have identified the behavioral and neural signatures of effective reading. They have been able to manipulate learning conditions in order to discover how learning is optimized, thereby gaining insights about reading instruction, disability, and remediation. In the first study, Dr. Sandak and colleagues isolated the component processes involved in reading, in order to examine their relative contribution to the training of the cortical reading system. They currently are studying how these components work together during reading acquisition.

Future directions for research include examining how these components work differently in individuals with reading disabilities, and in adolescents or adults with low literacy skills who have had different types of reading instruction. In terms of ELL students, it will be important to explore whether the signature of

efficient learning is the same for L1 and L2 in individuals, and whether the developmental course for bilingual and/or ELL students is the same as or differs from that of monolingual English individuals.

C. Invited Responses

The Reading Circuit in Different Languages/Orthographies

Ken Pugh, Ph.D., Yale University & Haskins Laboratories

There is a growing body of cross-language research indicating that the human brain develops remarkably similar neurocircuitry for reading, regardless of the language or orthography. This phenomenon raises a number of questions. Can these measures be used to identify children with reading disabilities? Can brain scans be linked with behavior? The neurobiological signature of reading disabilities, as well as the neurodevelopmental trajectories associated with successful reading acquisition, are likely to be similar between ELLs and monolinguals. Beginning monolingual readers tend to rely on a large network of brain regions, as they try to bind orthography to an already-present knowledge of phonology and semantics. As children gain language skills, they develop more of the efficient word recognition response in the left occipitotemporal (OT) region and demonstrate diminished involvement in the right hemisphere of the brain. By contrast, children with reading disabilities (RD) have a frontward and rightward trajectory of activity in the brain — a trajectory that is the opposite of what is seen in non-disabled, monolingual children.

To date, the most salient signature of reading disability across different languages is this disruption of the ventral OT area. This ventral system develops as a function of increased fluency, and its late development may limit its diagnostic utility for very young children who are just beginning literacy activity. Even though this left OT region is the most robust cross-language feature, it may be that tracking the developmental trajectory of this region longitudinally is a more accurate way to diagnose RD. Another effective method of diagnosis may be to look for the often-reported left hemisphere temporo-parietal anomaly and the corresponding shift in reading-related activation to the right hemisphere. It is also important to examine abnormal responses to spoken language stimuli, particularly the failure to adequately link L1 and L2 in this modality. Proficient readers show a greater overlap between L1 and L2 than do less proficient readers. These data indicate there may be an opportunity for early diagnosis within the language domain; most critically, the failure during early development to link print language with spoken language may be a very important precursor of the failure to develop an adequate trajectory in the LH OT region.

It is also necessary to look at other factors, such as perceptual processing and very subtle motion sensitivity, as are examined in the Eden and Demb studies, that have been found to be helpful in diagnosing children with dyslexia. These indicators can be detected very early and may constitute useful ways to track the differences between children with RD and those without disabilities. Finally, it is critical to measure the neurobiology of abilities such as cognitive processing, memory, attention, and other language switching and control operations — and to do so very early, since these abilities are the precursors of successful linguistic integration. Additionally, it is important to remember that functional neuroimaging is a tool, not an end in itself. There are a variety of other techniques to measure the structural and functional development of the brain, which also can help to identify those children who are likely to have special learning needs. Dr. Pugh concluded his presentation with a call for more research on normal brain and learning development, in the hope that links will ultimately be found to the underlying genetics of brain development.

Neuroimaging SPED/ELL Children

Guinivere Eden, Ph.D., Georgetown University

In examining issues related to the neuroimaging of ELL children with special educational needs, Dr. Eden identified important topics for future research. One involves the tasks that are used during the acquisition of brain imaging data – i.e., which tasks are needed in order to compare the performance of different groups of children, or different testing sessions, or different languages of origin. Another topic is the need to match data in imaging studies for reading experience, not just for age and IQ. A child with a reading disability, or a non-native English speaker, will behave differently from a monolingual child without disabilities. Scanner signals can be correlated with standardized test data to help mitigate this concern.

Dr. Eden also discussed the challenges that researchers face, such as trying to make a child's tasks as natural as possible, and limiting the amount of time a child spends in the scanner. While being scanned, children often are asked to read single words. It is harder to test a child who is reading an entire paragraph, because there are so many different variables. However, this type of study is important for accurate measurement of reading fluency and comprehension. An additional consideration is how to evaluate whether the children being scanned are performing a task at the same level as the members of a control group. Also, when testing a child in more than one language, should researchers use the same words, directly translated, or select comparable words? Dr. Eden reiterated the need for more longitudinal studies, since language and learning are dynamic processes and the brain changes so rapidly.

D. Discussion

Participants discussed the importance of conducting functional neuroimaging research on bilingual and ELL students and the use of appropriate control groups.

Further discussion focused upon the permanence of intervention-related changes in brain activity over time. In at least three studies, which showed changes in brain activation after reading interventions, those changes were still present at least one year after the intervention. Research is needed on the influence of environment upon biology, and vice versa. One participant expressed concern about developing neuroimaging profiles of normal individuals and those with learning disabilities, because it could result in over-simplification of screening results and/or negative labeling of children with ELL and/or LD issues. One panelist's response to this concern was that the field of neuroimaging is still in its infancy; there is a long way to go before neuroimaging can be used to "profile" children, and it should always be used in conjunction with behavioral and other assessments. Participants also discussed the similarities and differences between the oral language (auditory) processing patterns of dyslexic and non-dyslexic readers, and the need for further research in this area.

VII. Use of Technology in the Assessment/Screening and Support for LD Students Learning English as an Additional Language: Perspective from the UK

Ian Smythe, Ibis Creative Consultants, Ltd., London, UK

Dr. Ian Smythe was asked to address (1) whether computers can compensate for a shortage of human expertise in identifying and supporting learning disabilities in ELL students, and (2) how experience has demonstrated that children and their parents, teachers, and assessors all could gain from the effective use of information and communication technology.

Dr. Smythe identified several barriers to helping ELLs and SPED/ELLs, such as the lack of appropriate assessment tools, a severe shortage of local assessors with appropriate linguistic skills, and the ambiguous nature of LD labels. He questioned the need for these labels, and suggested that if a deficit is present, then support should be provided, irrespective of the label. However, he acknowledged that labels may be

useful in order to access funding. The key concern should be to identify ELL students' strengths and weaknesses, which in turn should lead to developing appropriate individual education plans.

While computers are no substitute for human assessors and cannot do everything, Dr. Smythe believes that they can help professionals overcome many hurdles. He cited ongoing work being conducted in Europe, addressing the key areas of assessment, teaching, resource development, and support. In the field of assessment, measuring basic cognitive processes such as auditory short term memory, sound discrimination, and visual short term memory skill could be carried out in the individual's first language by using computers and conducting assessments locally. Assessment developers have formed a framework of assessment, and developed appropriate software, which easily can be modified for different language environments.

More complex processes, such as reading (as well as stress, motivation, attention, etc.), cannot currently be assessed by the computer, and need a speaker of the language in question to be present. However, by using Internet-based video broadcast techniques, as demonstrated with bilingual (English/Welsh) adults in Wales, remote diagnosis can be performed, with due respect to the limitations of the system. These methods mean that highly qualified assessors do not need to be physically present with the student. Webcams also have been used to educate teachers and parents (who form an integral part of the support process), and to provide direct support to the pupil in his or her first language.

In addition, assistive technology that originally was designed for the learning disabled monolingual child has been adapted to help the multilingual student. One example is a screen reader, which (in addition to its text reading capability), can show a picture representing the word (semantic representation) whenever the user holds the mouse over a word. Furthermore, users who have literacy skills in their first language can use the look-up dictionary to translate single L2 words into the first language. Finally, on a word-by-word basis, sound files can serve as both a look-up and as reinforcement. This system is being experimentally studied in Hong Kong and Canada for its effectiveness as a support and learning tool.

Discussion

One participant noted that, in the United States, many researchers must wait for educational resources (software, etc.) to be commercially developed in the private sector, and wondered how to accelerate this process. Participants responded that there is a market for this type of technology in the U.S., and that researchers should contact publishing and software companies in order to register their needs. Small businesses and universities can apply for federal grants to fund innovative instrument and product development.

In response to a question, Dr. Smythe reported that a small amount of research has been conducted on the efficacy of computer-assisted assessments versus traditional assessments, but clearly, more research is needed. One dramatic advantage of using computer technology is that trained assessors need not be in the same location as the student; using a Webcam (with at least a two-megabyte connection), an assessor can evaluate many of a child's oral language abilities and difficulties, by observing him or her electronically.

VIII. Small Working Group Reports

Symposium participants were divided into small working groups, to identify research priorities and questions that must be addressed in order to move the field toward accurate and timely identification of learning disabilities in ELL students. They also were asked to identify how the federal government and the research community can build the necessary infrastructure for this research. This section integrates and summarizes the small groups' reports.

It was reiterated that ELL students encompass a broad range of backgrounds, abilities, and needs, and that any research agenda should allow an expansive definition of ELL. At the same time, this underscores the importance of conducting research that carefully characterizes the samples under study, in order to develop valid interpretations of their findings. Participants also reiterated the need for better identification and assessment of ELL students, and greater understanding of language and literacy developmental trajectories, as well as the individual and contextual factors that affect outcomes, including intersections with neurobiology. Both cross-sectional and longitudinal study designs are needed, as is more research on effective interventions; one group even called for another workshop focusing upon interventions for ELL LD students. Participants also communicated a need to use common sense and compassion in diagnosing, labeling, and intervening with multilingual children. A summary of issues raised by the groups is presented below, organized by broad topical themes.

A. Identification and Assessment of LDs in the ELL Population

It will be important to have information on the developmental trajectories of ELL students before the smaller subgroup of ELL students with learning difficulties can be identified. Classification research is needed that will accomplish the following goals:

- Replicate LD classification and identification studies of monolingual students with ELL students.
- Develop cross-sectional study designs, with sampling at multiple points in the continuum of development, to examine student learning characteristics.
- Broadly sample students with lower achievement and more restrictively sample those from the normative range of achievement, in order to capture the full range of ability levels. The sampling process must be as inclusive as possible, to be representative of learning abilities and problems that might exist in the ELL population.
- Develop assessment strategies that would allow us to understand the co-morbidities between specific kinds of learning problems, such as reading disability in ELLs and co-morbid conditions, such as attention deficit hyperactivity disorder (ADHD) or serious emotional disturbances.

In the area of assessment, tools must be developed to identify language, literacy, and academic competencies in ELL students:

- Measures are needed for screening children to identify students who are at risk for learning difficulties, as well as more detailed measures for full assessment to identify learning difficulties and to design and test interventions.
- Teachers need classroom-based assessments and tools to monitor student progress.
- It will be important to allow research to guide decisions regarding when assessment should be conducted in English and/or when it should be conducted in the first language.
- In addition to developing new measurement tools, it is important to determine whether the cognitive, linguistic, and neurobiological assessment tools that are effective with monolinguals also are effective with ELL and ELL-LD students. Do these measures require adaptation for use with ELL students? If so, what is the best way to determine the appropriate adaptations?

The benefits of using technology in assessment also should be explored. Can technology be used to develop a dual or “in-between” assessment model that assesses a child’s English ability but is adaptable to his or her primary language? It will be important to determine the advantages and disadvantages of using technology both in assessment and in the delivery and monitoring of appropriate interventions.

Finally, it is important to determine the effectiveness and appropriateness of accommodations for assessment, and the circumstances under which they should be used. While the use of accommodations for ELLs may not be needed indefinitely, they may serve as a transitional support; it will be helpful to determine when accommodations are needed, for how long, and how best to withdraw from or terminate them.

B. Normal Language and Literacy Developmental Trajectories for ELL

Learning disabilities are identified in contrast to typical development. Therefore, research must examine the development of both typical ELLs and ELLs with learning difficulties. The nature and process of English language acquisition in typical ELLs must be understood before one can accurately identify learning difficulties. Such research should involve both cross-sectional and longitudinal studies, and should examine both oral language development and literacy. Behavior in these two areas also should be correlated with neural activation patterns.

Many ELLs are failing in school, even though many of them probably do not have learning disabilities. It is important to discover the most effective methods for identifying the issues that impede the normal development (social, cultural, emotional, etc.) of ELLs in this country.

There are a number of language and cognitive factors to consider in longitudinal studies of ELLs:

- Do academic outcomes and English language acquisition vary, depending upon a child's first language – and if so, how?
- What is the child's level of proficiency in his or her first language and in English, at different points in time?
- What kind of school instruction (bilingual, ESL, general education) is the child receiving, and what effect does the instruction appear to have on the child's language and learning? It will be important for the instruction to be observed and documented, given the wide variation known to exist within such labels as "bilingual education." Do different methods of instruction benefit different patterns of English language acquisition?
- What effect does the loss of a child's first language skills have on the development of English, and vice versa? How should such language loss be measured and documented?
- How does the age of the learner at first exposure to the second language relate to proficiency in his or her first and second language?
- What are the implications of the language acquisition process in both the first and second languages for identifying and defining LD in ELLs? It is important to study the language development trajectories of children learning two languages simultaneously or sequentially, and to determine their implications for the identification and/or remediation of learning disabilities.
- How does language proficiency in L1 and L2 relate to other levels of academic achievement?
- How do all of these factors differ in heritage language situations, in which the children are native speakers of English learning a language for which few other native speakers are available to provide practice, linguistic context, and models?

In addition, it will be important that such studies examine contextual factors that can affect the learning trajectory of ELL students:

- What kind of school, neighborhood, and family factors affect the learning trajectory and risk status of ELL students?
- How do the influences of these different contexts change over time, or with age of first exposure?

- What school, neighborhood, or family factors affect student motivation?
- What contextual factors contribute to a child's successful academic achievement or make him/her more at risk status for learning problems?

D. Neurobiology

The application of neurobiology to language and literacy development is still in its earliest stages, but it holds great promise for providing new insights. The use of modern functional neuroimaging may enable researchers to address the neurobiological bases for language representation in bilinguals, especially *vis a vis* the age at which a second language is acquired and whether languages are acquired sequentially or simultaneously.

A subgroup addressing neurobiology issues outlined the following as logical next steps for research in this area:

- Develop a normative database of brain activation profiles (linguistic operations in first language).
- Develop similar norms for subsequent language(s) at successive stages of acquisition (for the same individuals), and for L2 in simultaneous language learners.
 - Compare profiles for L1 –L2, and for simultaneous vs. sequential language learners.
 - Determine the operations (tasks) in which L1 and L2 profiles differ.
 - Examine whether aberrant profiles correspond to particular behavioral/ psychological deficits.

IX. Summary

In summarizing the small working group reports, Dr. Peggy McCardle of NICHD pointed out that the five small groups had come up with many overlapping research priorities, and she encouraged participants to begin planning new studies now. Dr. McCardle emphasized that cross-sectional and smaller studies are needed, as well as large, longitudinal studies, and she reminded researchers that federal funding is available for studies of subgroups in different locations around the U.S. While more classification research needs to be conducted, longitudinal intervention research can be conducted concurrently, especially in school settings. She suggested that intervention research should involve the 20 percent of ELL children who, according to existing assessment tools, are performing at the lowest level. Their performance after various interventions should be compared to a group of “average” students.

The network of researchers who are studying reading in Spanish-speaking children (with joint funding from NICHD and the Institute of Education Sciences) soon will publish the results of their recent research. This will include the development of at least 15 new measurement instruments, as well as longitudinal data on the reading development of Spanish-speaking ELLs. This will help to inform the field but, as the workshop has emphasized, more research is needed both on Spanish-speaking ELLs and on those with other first languages. Dr. McCardle concluded by thanking the participants for traveling so far and working so diligently for two days to develop a national agenda of research priorities on learning disabilities in English Language Learners. (Note: The results of this symposium were presented at the OELA’s summit in December 2003 and posted for additional input from the research and practice communities.)

Additional closing comments from participants included the idea that ELL children who have learning disabilities should be viewed from a holistic perspective, not simply from a “deficit” model. Research should examine their adaptive skills, their non-linguistic skills, and what they can do under optimal conditions – not just their limitations. The need for classification/definition research was emphasized, with the caution that labels are scientifically useful for only three reasons: to aid communication among professionals, to improve prediction capability, and to indicate a neurobiological difference. Some participants felt that too little is known about ELLs with LD to apply this label to children, and that labels are dangerous, because they imply knowledge when there is none. Data are needed to develop a classification system/model that would provide developmental benchmarks for ELL-LD.

Participants also pointed out that more first language research is needed, despite the difficulty of conducting such research. Due to the plethora of first languages in this country, broad samplings would be needed to obtain a significant number of students with the same first language. Theoretical models also must be developed, which will enable us to look at first languages and strategically group those that show generalizable patterns for ELL students.

Other points included the involvement of parents, the influence of the home and cultural environment, and the parents’ access to information about their child’s progress in school. Participants also felt that it is important to conduct research into the quality of instruction, the language of instruction, and the types of support provided in schools. The great variation among school environments also was mentioned. To generalize about schools, a large sample is needed; this may be challenging, but undoubtedly it will prove to be well worth the effort.

APPENDIX A: BIOSKETCHES OF PRESENTERS

Diane August, Ph.D. is senior research scientist at the Center for Applied Linguistics and Principal Investigator of a NICHD-funded program project grant focused on the development of literacy in English Language Learners. She is also Staff Director for a Department of Education-funded National Literacy Panel on Language Minority Children and Youth. Previously she was a Senior Program Officer at the National Research Council and study director for the Committee on Developing a Research Agenda on the Education of Limited English Proficient and Bilingual Students. Dr. August has also worked as a public school teacher and school administrator in California, a legislative assistant in the area of education for a U.S. Congressman from California, a grants officer for the Carnegie Corporation of New York, Director of Education for the Children's Defense Fund, and an education consultant in evaluation and testing, program improvement, and federal and state education policy. She has a Ph.D. in education from Stanford University.

Manuel Barrera, Ph.D. is Executive Director of the Education Department at the Metropolitan State Urban Teacher Program. He conducts research in curriculum-based assessment for learners with limited English proficiency and learning disabilities and the use of information technology in educational settings. He is a research associate with the National Center on Educational Outcomes at the University of Minnesota, Project Evaluator for the Arrowhead Preparing Tomorrow's Teachers for Technology at the University of Minnesota Duluth, and President-Elect of the Minnesota Council for Children with Emotional/Behavioral Disorders.

Lilly Li-Rong Cheng, Ph.D. is a professor in the School of Speech, Language, and Hearing Sciences at San Diego State University and the Executive Director of Global Partnership Development of the California State University, San Marcos. She is a fellow of the American Speech-Language Hearing Association (ASHA), and served as past president of the International Affairs Association, a professional organization related to ASHA. Dr. Cheng is the recipient of the 1997 ASHA Award for special contributions to Multicultural Affairs, and of the 2002 Diversity Award from the California Speech & Hearing Association. She received a master's degree in Linguistics from Southern Illinois University and in Speech-Language Pathology from Michigan State University. She obtained her doctoral degree in Speech Language Pathology and Multicultural Education from Claremont Graduate University and San Diego State University. Dr. Cheng has researched bilingual acquisition, language and culture, cross-cultural communication, and speech-language pathology of the bilingual/multicultural population and lectured on working with the ever-growing bilingual/multicultural populations in the United States and many parts of the world. Her latest book entitled "Communication Disorder across the Life Span" was published June of 2003.

Timothy E. D'Emilio completed doctoral studies in Curriculum Design and Evaluation at the University of Pittsburgh in 1981. He worked in community-based organizations in developing bi-literacy programs for native Spanish- and English-speaking pre-schoolers, and conducted research on metropolitan Washington area Hispanic families for HHS. He worked in the bilingual education offices at the district and state levels before joining the federal government in 1991. He is currently a research analyst in OELA monitoring contracts, including those of OELA's "National Clearinghouse for English Language Acquisition" and the "Descriptive Study of Services to LEP Students and LEP Students with Disabilities."

William G. Demmert, Jr., Ed.D. is Professor of Education at Western Washington University. In addition to his work with the RAND Corporation on a review of the research literature on the education of Native Americans, and on an analysis of the National Assessment of Educational Progress (NAEP) data

targeting Native American students, Dr. Demmert is working with the Northwest Regional Educational Laboratory to review and assess available quantitative research on the influences of language and cultural programs on the education of Native American students. Professor Demmert recently served as a member of the Independent Review Panel created by the U.S. Congress to undertake a national assessment of Title I, of the Elementary and Secondary Education Amendments (ESEA), and other federal programs in the U.S. Department of Education, 1995-2001. He was appointed by the U.S. Department of Education (along with former Secretary of Education Terrel H. Bell) as co-chair of the Indian Nations at Risk Task Force and served as the primary writer for the Indian Nations at Risk Task Force Report published in October, 1991. He served as the first U.S. Deputy Commissioner of Education, Office of Indian Education, U.S. Office of Education, 1975-1976; the Director of Indian Education Programs, U.S. Bureau of Indian Affairs, 1976-1978; and as the Commissioner of Education, State of Alaska, 1987-1990.

Guinevere Eden, Ph.D. is an associate professor in the Department of Pediatrics and directs the Center for the Study of Learning at Georgetown University Medical Center, Washington DC. Funded by the NICHD and in collaboration with Gallaudet University and Wake Forest School of Medicine, the center's research focuses on the neurobiological representation of reading and how it may be altered in individuals who have developmental dyslexia or are deaf. Further, she and her colleagues are researching how reading is impacted by instructions or mode of communication and are utilizing functional MRI to study the neurobiological correlates of reading remediation. Dr. Eden received her Bachelors degree from University College London in Physiology and her Ph.D. from the Department of Physiology, Oxford University. She came to the United States in 1993 to pursue a Fogarty Fellowship at the National Institutes of Mental Health, Bethesda MD, on the application of functional neuroimaging techniques to study individuals with dyslexia. She is currently a board member of the International Dyslexia Association and serves on the editorial boards of the *Annals of Dyslexia* and *Learning Disabilities Research and Practice*.

David J. Francis, Ph.D. is Professor of Quantitative Methods and Chairman of the Department of Psychology at the University of Houston, where he also serves as Director of the Texas Institute for Measurement, Evaluation, and Statistics. He is currently the Principal Investigator of a program project grant on oral language and literacy acquisition in Spanish-speaking children that is jointly funded by NICHD and the Institute for Education Sciences, Department of Education. He has collaborated for many years in research on reading and reading disabilities, attention problems, and developmental consequences of brain injuries and birth defects. Dr. Francis currently serves on many advisory panels, including the Independent Review Panel for the National Assessment of Title I, the National Technical Advisory Group of the What Works Clearing House for the U.S. Department of Education, and the National Advisory Committee for the National Center for Educational Accountability. Previously, he has served as Advisor to the U.S. Department of Education during Negotiated Rule Making for No Child Left Behind, as Chairman of the Mental Retardation Research Subcommittee at NICHD, as Chairman of the Advisory Council on Education Statistics, and as a member of the NIH's Behavioral Medicine Study Section, and of the National Assessment Governing Board's Taskforce on the Use of NAEP to Corroborate State Test Results.

Fred Genesee, Ph.D. is a professor in the Psychology Department at McGill University, Montreal, Canada. He has carried out extensive research on alternative approaches to bilingual education, including second/foreign language immersion programs for language majority students and alternative forms of bilingual education for language minority students. He is currently co-investigator on a longitudinal national study of a number of two-way immersion programs in the U.S. Dr. Genesee is also interested in basic issues related to language learning, representation, and use in bilinguals. His current work in this domain focuses on simultaneous acquisition of two languages during early infancy and childhood – his specific interests include language representation (lexical and syntactic) in early stages of bilingual acquisition, transfer in bilingual development, structural and functional characteristics of child bilingual

code-mixing, and communication skills in young bilingual children. A new line of research will examine the language/speech processing skills of pre-verbal bilingual and second language infants. Collectively, this work seeks to extend our understanding of the limits of the human faculty for language acquisition which, to date, has been based primarily on studies of monolingual acquisition.

Maria Hernandez-Ferrier, Ph.D. was promoted to the position of Deputy Under Secretary of Education in October 2003, and continues to serve as director of the Office of English Language Acquisition and as principal adviser to the Secretary of Education on all matters related to Hispanic issues and limited English language learners. Dr. Hernandez-Ferrier oversees the distribution of \$665 million in funding for English language learners, and works to ensure that the nation's five million students who are learning English receive the same high-quality education as their peers. She has also started an education campaign to let parents know what their rights and benefits are under the No Child Left Behind education reform law. The bilingual granddaughter of Mexican immigrants, Dr. Hernandez-Ferrier has 17 years of experience in Texas public schools. Her accomplishments include creating many award-winning model programs for assisting underserved children and youth. Prior to her appointment to OELA, she served as the executive director of City Year, the program model for AmeriCorps, a federal national service organization. City Year brings young people from diverse backgrounds together to provide services for children in low-income elementary schools. Dr. Hernandez Ferrier is also the recipient of numerous awards including the United Way Volunteer of the Year Award and the Minority Leadership Award from the National Community Education Association. She earned a doctorate in education administration from Texas A&M University.

Aquiles Iglesias, Ph.D. is a professor in the Department of Communication Sciences (Speech-Language Pathology Program), College of Health Professions and Dean of the Graduate School at Temple University. For the last 17 years, Dr. Iglesias has been the principal investigator of 7 federal training grants designed to increase the representation of disadvantaged students at Temple. He has served as the Associate Director of the National Center on Inner Cities and the Mid-Atlantic Regional Education Laboratory, both housed at Temple University and funded by the IES, U.S. Department of Education. Dr. Iglesias' area of research is language acquisition in bilingual (Spanish/English) children and he has published extensively in this area. He presently is the Principal Investigator of a 6-year NIDCD (NIH) funded contract to develop an assessment protocol for bilingual (Spanish/English) children and co-PI of an IES-funded project to examine the relationship between oral narrative skills and literacy in Latino children.

Kathryn Kohnert, Ph.D. is an assistant professor in the Department of Communication Disorders at the University of Minnesota. Dr. Kohnert's research investigates the relationship between first and second languages in developing bilinguals, and between language and basic cognitive processes (such as perception, attention, memory) in diverse learners, with and without language impairments. She is also a nationally certified bilingual speech-language pathologist and a former teacher of English as a second language. Her publications include numerous articles in peer-reviewed journals as well as clinical intervention programs in English and Spanish.

Peggy McCardle, Ph.D., M.P.H. is Associate Chief, Child Development and Behavior Branch, Center for Research for Mothers and Children, at the NICHD. Dr. McCardle holds a bachelor's degree in French, a doctorate in linguistics, and a master's degree in public health. Early in her career, Dr. McCardle was an elementary classroom teacher. She has held both university faculty positions and hospital-based clinical positions, and has published articles addressing various aspects of developmental psycholinguistics as well as issues in public health. At the NIH she has served as a scientific review administrator and as a senior advisor the Deputy Director for Extramural Research in the Office of the NIH Director, before joining the NICHD. In addition to her duties as Associate Chief, she directs the research program in Language, Bilingual and Biliteracy Development and Disorders, which includes three interagency-funded

research networks: the Biliteracy Research Network (Development of English Literacy in Spanish Speaking Children); the Adult Literacy Research Network; and the new Adolescent Literacy Research Network. She also serves as the NICHD liaison to the National Reading Panel, is on the steering committee of the National Literacy Panel for Language Minority Children and Youth, and leads or serves on various interagency working groups.

Gail McKoon, Ph.D. is Professor of Psychology and Cognitive Science at Ohio State University. Her areas of research include discourse comprehension and memory. She has published over 100 peer-reviewed articles and served on numerous grant review panels for NIH, the Department of Education, and the National Science Foundation.

Joan Mele-McCarthy, D.A. is Special Assistant to the Assistant Secretary of Special Education and Rehabilitation Services in the U.S. Department of Education. Her work in OSERS revolves around issues with children who have disabilities and the professionals who serve them. Prior to this appointment, Dr. Mele-McCarthy, owned and directed a multidisciplinary pediatric private practice serving clients between the ages of two and college age who had communication disorders, language learning differences and disabilities (with emphasis on reading disabilities and dyslexia), and processing difficulties. Dr. Mele-McCarthy's professional experiences include work in public schools, private schools, hospitals and private practice settings. Dr. Mele-McCarthy has served as a clinical and academic faculty member at several universities in the field of communication sciences and disorders. Her work includes presentation of peer reviewed research-to-practice papers, as well as seminars and workshops locally and nationally. She has served on executive boards of several professional associations in her field.

Robin Morris, Ph.D. is the Associate Dean for Research and Graduate Studies and Regent's Professor of Psychology in the College of Arts and Sciences at Georgia State University. He also holds a joint appointment in the Department of Educational Psychology and Special Education in the College of Education, and is the founding Director of the Regents Center for Learning Disorders at Georgia State University, which serves 16 colleges and universities in the Board of Regents System. He holds faculty research appointments in the NSF Center for Behavioral Neuroscience based in Atlanta, and the Center for Research on Atypical Development and Learning at Georgia State. Dr. Morris received his Ph.D. at the University of Florida in Clinical Psychology and Neuropsychology. He has focused his scholarly and clinical work on the biological and environmental causes of learning, attentional, developmental and acquired neurological problems in developing children and adults with a variety of disorders, and cognitive and neuropsychological development in typically developing children. He has published widely in these areas, and has federal grant awards from the National Institute of Child Health and Human Development, the Interagency Educational Research Initiative. His current research is focused on reading and language development, reading disabilities and dyslexia, bilingual language and reading development, and the neuroimaging of the developing brain. He was recently appointed by President Bush, and confirmed by the Senate, to the Board of the National Institute for Literacy (NIFL).

Andrew Papanicolaou, Ph.D. is Professor and Director, Division of Clinical Neurosciences in the Department of Neurosurgery at the University of Texas – Houston. He is also Director of the Magnetic Source Imaging Unit at Memorial Hermann Hospital in Houston, and Director of the Vivian Smith Advanced Studies Institute of the International Neuropsychological Society. Dr. Papanicolaou is currently Principal Investigator on a number of grants, including NICHD-funded grants on “Mathematics Cognition and Specific Learning Disabilities,” “Imaging Networks for Memory Processing,” and “Biological and Behavioral Variation in the Language Development of Spanish-Speaking Children.” He received his Ph.D. in Psychology from Southern Illinois University at Carbondale.

Kenneth R. Pugh, Ph.D. is a research scientist at the Yale University School of Medicine (Pediatrics) and also holds an appointment as a Senior Scientist at the Haskins Laboratories, New Haven, CT. His

primary research interests are in the areas of cognitive neuroscience and psycholinguistics. His research program examines the neurobiology of language development with a particular emphasis on reading and reading disability, and employs combined behavioral and functional neuroimaging techniques. He also directs the NIH-funded Yale Reading Study.

Rebecca Sandak, Ph.D. is a senior scientist at Haskins Laboratories. Her research is focused on understanding the cognitive processes underlying skilled and impaired reading, reading acquisition, and successful reading instruction and remediation. In her recent work she has been employing functional neuroimaging (fMRI) to investigate how learning conditions, reading expertise, and reading strategies influence the cortical areas that are recruited for reading. She is presently a lead investigator on a research project (in collaboration with the Kennedy-Krieger Institute and Educational Testing Services) evaluating the behavioral and neural effects of several research-driven intervention methods for improving the reading abilities of struggling adolescent readers.

Linda Siegel, Ph.D. is Associate Dean of Graduate Programs and Research and a professor in the Department of Educational Psychology and Special Education at the University of British Columbia in Vancouver, British Columbia, Canada, where she holds the Dorothy C. Lam Chair in Special Education. She has conducted research in learning disabilities, language and cognitive development, the role of psychoeducational assessment in the identification of learning disabilities, bilingualism, premature and high-risk infants, and the early identification of learning disabilities. Dr. Siegel received her B.A. degree from Queens College in New York and a M.S. and Ph.D. degrees from Yale University. She has served as the editor of the *International Journal of Behavioural Development* and the Associate Editor of *Child Development*.

Ian Smythe, Ph.D. is an international dyslexia consultant, working on specific learning difficulties in different countries and multilingual environments. He has worked with government departments and non-governmental organizations in many countries, developing resources and conducting workshops for teachers, parents, researchers, and other professionals working with dyslexic individuals. His web-based assessment tools in multiple languages developed in association with the Adult Dyslexia Organisation, is now being promoted by the U.K. government as a model for internet based-support systems for other organizations. He is also team leader for several multinational European Union funded projects, including internet delivery of training for those teaching dyslexics in many languages, including bilingual contexts. Dr. Smythe writes extensively on the assessment of the multilingual individual, was editor of the *British Dyslexia Association's Dyslexia Handbook* from 1999 to 2001, and is the principle editor of *The International Book of Dyslexia* (2003), which includes reviews of dyslexia in 18 languages and dyslexia provision in 53 countries.

Richard Wagner, Ph.D. is the Alfred Binet Professor of Psychology at Florida State University. He earned a Ph.D. in cognitive psychology from Yale University in 1985, and a Master's Degree in School Psychology from the University of Akron. Before embarking in his research career, he completed a year of internship and two years of experience as a school psychologist. His major area of research interest is the acquisition of complex cognitive knowledge and skills, which he has pursued in two domains. In the domain of reading, his research has focused on the role of reading-related phonological processing abilities in normal and abnormal development of reading skills, and in the prediction, prevention, and remediation of dyslexia. In the domain of human intelligence, his research has focused on the role of practical knowledge and intelligence in intellectual performance manifested outside the classroom setting. His work has addressed a variety of measurement issues and practical considerations involving assessment of constructs in the domains of language, reading, and intelligence. He has coauthored a test of practical intelligence called the *Tacit Knowledge Inventory for Managers* published by the Psychological Corporation, and is coauthor on tests of phonological processing and reading published by PRO-Ed.

**APPENDIX B:
SYMPOSIUM PARTICIPANTS**

Jamal Abedi, University of California Los Angeles
Drew Albritten, Council for Exceptional Children
Diane August, Center for Applied Linguistics
Manuel Barrera, Metropolitan State University
Joanne Carlisle, University of Michigan
Lilly Li-Rong Cheng, San Diego State University
Alan Coulter, Louisiana State University
Laurie Cutting, Kennedy Krieger Institute and Johns Hopkins University
Timothy D'Emilio, Office of English Language Acquisition
William Demmert, Western Washington University
Grace Zamora Durán, Office of Special Education and Rehabilitative Services
Guinevere Eden, Georgetown University
Maria Ferrier, Office of English Language Acquisition
Todd Fletcher, University of Arizona
David Francis, University of Houston
Fred Genesee, McGill University
Russell Gersten, Instructional Research Group
Darion Griffin, American Federation of Teachers
Nancy Hennessy, International Dyslexia Association
Erika Hoff, Florida Atlantic University
Sheldon Horowitz, National Center for Learning Disabilities
Aquiles Iglesias, Temple University
Kathryn Kohnert, University of Minnesota
Socorra Lara, Office of English Language Acquisition
Stephanie Lee, Office of Special Education and Rehabilitative Services
Kathleen Leos, Office of English Language Acquisition
Richard Long, International Reading Association
Giselle Lundy-Ponce, American Federation of Teachers
Joy Markowitz, National Association of State Directors of Special Education, Inc.
Peggy McCardle, National Institute of Child Health and Human Development
Denise McKeon, National Education Association
Gail McKoon, Ohio State University

Joan Mele-McCarthy, Office of Special Education and Rehabilitative Services

Robin Morris, Georgia State University

Andrea (DeeDee) Moxey, American Speech-Language-Hearing Association

Jack A. Naglieri, George Mason University

Alba A. Ortiz, University of Texas – Austin

Verónica Ortiz de Elizondo, Mexico

Andrew Papanicolaou, University of Texas – Houston

Robert Pasternack, Office of Special Education and Rehabilitative Services

Kenneth R. Pugh, Yale University

Patti Ralabate, National Education Association

Jorge Ramos, Pro-ed Latinoamerica, S.A. de C.V., Mexico

Margarita Ramos, Centro de Investigacion y Diagnostico, S.C., Mexico

Charlene Rivera, George Washington University

David Rose, Center for Applied Technology

Claudia Saad, American Speech-Language-Hearing Association

Rebecca Sandak, Yale University

Tanya Shuy, National Institute for Literacy

Linda Siegel, University of British Columbia, Canada

Ian Smythe, Ibis Creative Consultants, Ltd., United Kingdom

Deanna Stecker, National Center for Learning Disabilities

Marina Tse, Office of English Language Acquisition

Carol Valdivieso, Academy for Educational Development

Thomas Viall, International Dyslexia Association

Rick Wagner, Florida Center for Reading Research