

**TECHNICAL REPORT #1:**

**The Development of Early Literacy Skills in Bilingual and Spanish-speaking Preschool-age  
Children: A Literature Review**

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**The development of early literacy skills in bilingual and Spanish-speaking preschool-age children: A literature review**

The development of early literacy skills for Spanish English bilinguals (SEB) is an important foundation for designing and interpreting assessments and related results with SEB populations. More specifically, understanding the way in which early literacy skills develop in Spanish is crucial when evaluating *performance* and *progress* in U.S. SEB preschool-age children. Without adequate knowledge of the ontogeny of early Spanish language and literacy skills, young children in this population who are at-risk for later reading difficulties cannot be appropriately identified and recommended for intervention. Gaining this understanding is especially timely as the population of Spanish-speaking children continues to increase in the United States (Garcia, Jensen & Scribner, 2009).

While some SEB children fare well on early literacy achievement standards, many others are not so lucky: Among all Latino students in special education, approximately fifty-six percent have a learning disability related to reading (Zehler, Fleischman, Hopstock, Stephenson, Pendzick & Sapru, 2003). Furthermore, SEB preschoolers generally perform poorly on measures evaluating language and early literacy, and continue to perform worse than Caucasian and Asian children throughout all years of formal schooling, even when controlling for socio-economic status (Garcia & Jensen, 2009). Similarly, statistics from 2000 state that 58% of Hispanic fourth graders performed at a below-basic reading level, as compared to 27% of Caucasian fourth graders with the achievement gap between Hispanic and Caucasian children continuing to widen (Paez, Tabors & Lopez, 2007): as of 1999, Spanish-speaking high school seniors were, as a population, performing at an eighth grade reading level (Dickinson, McCabe,

Clark-Chiarelli & Wolf, 2004). More up-to-date statistics from the National Assessment of Educational Progress (NAEP) suggest that performance of Spanish-speaking children has improved, but performance of English-speaking children has as well, thereby cancelling out any gains from a national standard perspective (NAEP, 2011). This disadvantaged performance record may be due to the fact that Spanish-speaking families are more likely to live in situations that add risk factors to their children's academic achievement (e.g. live in poverty and in densely populated areas, do not have health insurance, have less access to preschool, speak primarily Spanish at home, less likely to read to their children, etc.) (Garcia & Jensen, 2009; Mancilla-Martinez & Lesaux, 2011). On the same note, Davison and Brea-Spahn (2012) state that the two major risk factors for developing reading difficulties are low economic status and a non-English-speaking home. From these statistics, it seems highly likely that SEB children will possess both of these risk factors.

One purpose of the Individual Growth and Development Indicators 2.0 (IGDIs 2.0, McConnell et al., 2010) is to assess early language and literacy skills for English-speaking preschool-age children in order to inform early intervention decisions to prevent reading difficulties in later grades. Given the statistics regarding reading difficulties in the Spanish-speaking population, it seems necessary to develop a complementary measure for Spanish-English bilingual children. There are three challenges that accompany the prospect of designing this assessment, however: First, Spanish language is acquired in patterns that differ from those in English. Second, the variability in the timing, quantity, and quality of language input received by Spanish-English bilingual children in both English and Spanish creates a broad range of expected ability based on environmental factors (including home language use patterns, SES, language of instruction, and community language contexts) (Hammer & Rodríguez, 2012). This

continuum of performance leaves researchers with the challenging task of developing norms or cut-off scores to identify delay given the broad range of ability to be expected in this population. Third, the measures must also reflect cultural differences in early vocabulary development as early language development is most directly influenced by the child's socialization within their home environment.

Although there is still considerable work to be completed in the area of Spanish language acquisition, differences between Spanish and English language development have been identified. For example, Spanish has more defined syllabic structure and more straight-forward orthography than English. As a result, onset-rime awareness and division are more important for English than for Spanish given the focus on the syllable level in Spanish (Durgunoglu, Nagy, & Hancin-Bhatt, 1993). Also, Spanish follows a noun-adjective grammatical pattern, as compared to an adjective-noun sequence in English (Gorman & Gillam, 2003). Finally, differential performance on a variety of semantic tasks suggests that receptive and expressive language may develop in a different order in Spanish than in English: in a study by Peña, Bedore, and Rappazzo (2003), children performed better on function tasks in English but better on similarities and differences tasks in Spanish (Peña, Kester & Sheng, 2012).

In addition to the challenge presented by the differences in acquisition of English and Spanish, the process of designing the Spanish IGDIs (S-IGDIs) may be further complicated by the heterogeneity found in the SEB preschool population given the differences in the timing, quality, and quantity of exposure in both English and Spanish. Two broad but distinctive categories exist to provide a starting point for organizing the diversity in language backgrounds into meaningful units of analysis. First, simultaneous bilinguals are those children who are exposed to relatively balanced amounts of English and Spanish in their homes. Second,

sequential bilinguals are those children who primarily speak Spanish at home, but are formally exposed to English when they enter predominantly English preschool environments (Paradis, Genesee, & Crago, 2010; Gorman & Gillam, 2003). The S-IGDIs will be designed for use with both of these populations and, as significant differences in performance would be expected in both Spanish and English across these populations, children's linguistic backgrounds (i.e. whether they are simultaneous or sequential bilinguals) will need to be factored into the interpretation of their performance on the S-IGDIs.

Regardless of whether SEB children's English exposure occurs simultaneously with or sequentially after Spanish, their existing Spanish skills are connected to their English skill development. Two theories help to explain this language learning relationship. First, the Developmental Interdependence Hypothesis (DIH; Cummins, 1979) asserts that competence in a second language (L2) depends upon proficiency achieved in the first language (L1) at the time when L2 acquisition begins (Cummins, 1979; Cardenas-Hagan, Carlson & Pollard-Durodola, 2007). From this premise, it makes sense that L1 vocabulary and language home environment influence the ease with which L2 can be learned. Competence in L1 skills should be the best predictor of learning to read in L2 (Cardenas-Hagan et al., 2007). Second, MacWhinney's Unified Model of Language Acquisition (2008) builds upon the DIH by stating that whatever can transfer from L1 to L2 will do so. This theory in particular provides hope for SEB children from varying linguistic backgrounds as it suggests that even children with lower L1 skill levels can transfer what they know to their L2. Furthermore, transfer depends on the similarity between languages, making the investigation of similarities and differences between English and Spanish all the more informative for S-IGDI development.

Perhaps the most important challenge to overcome during the development of the S-IGDI measures will be to take one step further and apply the knowledge we have regarding the linguistic and cultural differences that exist between English-speaking and SEB children (e.g. language-specific acquisition skills, variability in exposure to each language, culture-specific home language environment). In order to successfully account for inter-language diversity, it will be helpful to consider the four tenets of equivalency as described by Peña (2007): linguistic, functional, cultural, and metric equivalence. While Spanish and English are linguistically different languages, it is essential that the S-IGDIs still achieve the same outcomes as do the English IGDI 2.0: to accurately evaluate the early literacy skills of preschool-age children in order to identify those who need early intervention. Adhering to the definitions and suggestions of Peña's tenets will assist the research team in creating a complementary, equivalent measure to the English IGDI 2.0.

The most basic of the four tenets is linguistic equivalence, which calls for equality in word use and linguistic meaning in both measures: If an item is the same on both measures, then the Spanish word chosen must reflect the same meaning as the English word. Instructions delivered to the children also need to be linguistically equivalent to elicit the same response to a prompt. However, linguistic equivalence is rarely considered without the other equivalency tenets, as direct translation from English to Spanish would leave the S-IGDIs biased toward English language and literacy developmental trajectories.

Functional equivalence will ensure that both measures evaluate the same construct through the use of decentered (translated to make the measure linguistically familiar for both languages) and dual-focus (translated to make each language's measure equally clear, usually resulting in different stimuli for each language) translation.

Cultural equivalence builds upon functional equivalence by taking into account the cultural differences between speakers of each language that may cause differential interpretation of item meaning or may influence what vocabulary is learned first given the child's cultural context. For example, Spanish-speaking children may be more familiar with mangos and tortillas than apples and bread. Therefore, under this tenet, vocabulary used in stimuli may differ by language in order to reflect words and concepts that are culturally relevant to SEB preschoolers. Vocabulary words for the S-IGDIs will be selected from robust indicators of Spanish oral language including the MacArthur-Bates Inventario del Desarrollo de Habilidades Comunicativas (Fenson, Marchman, Thal, Dale, Reznick & Bates, 2007) which was developed with SEB children in the U.S. The vocabulary reflects the developmental trajectory found in this population.

Achieving metric equivalence in the S-IGDIs will mean that there is equality in item difficulty even though exact stimuli content may vary in order to satisfy functional and cultural equivalence. Examples of metric equivalence include the use of word frequency lists for each language to ensure that words chosen for items are comparable in familiarity, the use of the same number of each word category (although the actual words may differ by language), and the use of the same range of item difficulty based on each language's properties (Peña, 2007). While designing an equivalent measure will be difficult, the use of these four equivalency tenets will ensure that the S-IGDIs are an accurate measurement of SEB literacy.

The purpose of this literature review is to outline the continuum of skills represented within each of three early literacy domains in Spanish-English bilingual (SEB) and Spanish-speaking preschool-age children: phonological awareness (PA), oral language (OL), and alphabet knowledge (AK). Each domain will be defined and findings regarding current understanding of

the domains for SEB children will be presented. By defining each domain and reviewing the literature to support the development of each domain in Spanish we will be better equipped to begin the process of creating S-IGDIs. From this information, suggestions for item design in each domain will be offered, as well as a summary of the ways in which items in each domain will meet equivalency tenet standards.

### **Phonological awareness**

The development of phonological awareness (PA) in SEBs has been the subject of a relatively large body of research reflecting on the current need for exploratory analyses describing how the continuum of skill is obtained. However, even with the recent intensity in research examining PA, understanding how it develops and the necessary component skills is still incomplete (Branum-Martin, Mehta, Carlson, Carlo, Fletcher, Ortiz & Francis, 2006). Common themes in existing research will be highlighted in order to refine and scope the nature of the continuum of PA development in SEB children, thereby ensuring that robust, evidence-based practices will be used to develop PA items on the S-IGDIs. First, however, it is essential to answer the question: What is phonological awareness?

*Defining phonological awareness.* In general, previous studies' definitions of phonological awareness overlap in semantics yet differ in exact phrasing. For example, Durgunoglu and colleagues (1993) describe PA as a meta-linguistic ability involving manipulation of the structural properties of a language. Branum-Martin and colleagues (2006) refer to PA as the recognition, discrimination, and manipulation of linguistic sounds. Cardenas-Hagan and colleagues (2007) say that PA is the identification and manipulation of speech units and the development of letter-sound correspondence. To consider the contributions of each definition, it seems most appropriate to attempt to combine the wording from several sources to

paint the clearest picture of this domain. *Phonological awareness, then, is the meta-linguistic ability to understand that spoken words are comprised of small sound units; to detect, discriminate between, and manipulate these structural components; and to perform these skills independent of word meaning (Durgunoglu, Nagy & Hancin-Bhatt, 1993; Branum-Martin, Mehta et al., 2006; Cardenas-Hagan, Carlson & Pollard-Durodola, 2007; Kuo & Anderson, 2010; Gorman & Gillam, 2003; Anthony et al., 2011; Cisero & Royer, 1995).*

Generally, PA in Spanish does not differ from PA in English by definition, but rather in the way in which skills are obtained in order to achieve PA. Phonological awareness is a critical early literacy domain as it predicts spelling and comprehension skills in all alphabetic languages (Cardenas-Hagan et al., 2007; Anthony et al., 2011). Delays in these skills inhibit children's ability to recognize words based on letter-sound relationships, potentially leading to reading delay or failure (Gorman & Gillam, 2003), which is the exact outcome the S-IGDIs will attempt to prevent. Further, Carrillo (1994) describes PA as a concomitant of reading development, in that PA predicts reading ability and reading subsequently improves and increases sophistication of PA skills.

Phonological awareness has been tested via a variety of tasks, all of which involve identification and manipulation of the structural units of language and vary in level of difficulty. These tasks include *segmenting* (dividing words into syllables, phonemes, and onset-rime units), *blending* (identifying a word when its phonemes or syllables are spoken with breaks in between), *matching* (identifying a word with the same onset sound as the target word; referred to as sensitivity to alliteration by Carrillo (1994)) (Durgunoglu et al, 1993); *elision* (deleting syllables and phonemes in order to form new words) (Cardenas-Hagan et al, 2007); *rhyming* (identifying a word with the same rime, or ending sound, as the target word) (Anthony et al, 2011; Carrillo,

1994); *identification of discrepant sounds* (Kuo & Anderson, 2010); *position segment identification* (stating whether the target phoneme is the initial, medial, or final phoneme), and *segment isolation* (identification of initial or final phoneme or syllable following hearing the target word; related to segmenting) (Carrillo, 1994; Cisero & Royer, 1995).

Due to strong correlations between PA tasks, phonological awareness can be thought of as a unified underlying construct that manifests in a sequence of skills that are increasingly complex (Anthony et al., 2011; Branum-Martin et al., 2006). One point to note, however, is that elision tasks in Spanish and English seem to bring out unique aspects of PA that are not present in other tasks (Branum-Martin et al., 2006), so it is still possible that viewing PA as completely unified is inaccurate. Now that PA has been defined, recent findings related to this suite of component skills can be discussed.

*Current state of research.* The extant work involving Spanish phonological development provides enlightening convergence as well as thought-provoking divergence. An important issue from the linguistic equivalence perspective of S-IGDI development is to note that current literature does not provide a clear answer of whether the sequence of Spanish PA skills progresses in a manner that is similar to or differs from that of English phonological awareness. Before addressing the possible similarities and differences in Spanish and English PA development, however, it may be most sensible to outline the structural differences between the two languages.

To begin, English is a language with deep, opaque orthography (Gorman & Gillam, 2003), meaning that phonology does not always predict word spelling. In contrast, Spanish has shallow, transparent orthography (Anthony et al., 2011) which often enables Spanish-speaking children to spell words that they cannot yet read (Manrique & Signorini, 1994 in Gorman &

Gillam, 2003) because phonology maps onto orthography so consistently. To continue characterizing each language's phonology and structure, English is a stress-timed language with syllable duration dependent upon syllable stress and unclear syllable boundaries due to a consonant-vowel-consonant pattern, and Spanish is a syllable-timed language with syllables of equal duration and syllable boundaries made clear by the consonant-vowel pattern that signals syllable break (Gorman & Gillam, 2003). As a result of these structural properties, onset-rime units are a more helpful way for English speakers to understand orthography, while the syllable is a more salient sound unit for Spanish speakers learning to spell (Durgunoglu et al., 1993).

Gaining awareness of other structural properties of these two languages will enhance our understanding of the need for linguistically equivalent items in the S-IGDIs. For example, content words in English are often monosyllabic while content words in Spanish are often polysyllabic and function words are more likely to be monosyllabic (Anthony et al., 2011; Gorman & Gillam, 2003). Also, consonant blends are more frequent in English and can occur in all positions of a word, whereas these clusters are less common in Spanish (Gorman & Gillam, 2003). Finally, English has more possible vowel sounds than does Spanish, leading beginning English speakers to make more vowel identification errors than early Spanish speakers (Gorman & Gillam, 2003).

The knowledge of structural differences between English and Spanish can be used as a building block to understanding the similarities and differences in PA development in these two languages. Anthony and colleagues (2011) call the differences in Spanish and English PA sequences "small exceptions" (p. 858), and Gorman and Gillam (2003) and Carrillo (1994) assert that the developmental progression of PA is similar in Spanish and English. Exact terminology of PA development stages differs by author, but a consensus seems to have been reached that PA

abilities can be placed on a developmental continuum and split into categories. In both languages, children become increasingly aware of smaller units of sound as they get older, following a progression of awareness from words to syllables to onsets and rimes to phonemes. They distinguish between same- and different-sounding words before same and different sounds, blend units before segmenting them, and gain elision ability last (Anthony et al., 2011; Gorman & Gillam, 2003; Branum-Martin et al., 2006). One important exception to this agreed-upon developmental pathway is that Spanish-speaking children may acquire skills that involve syllable blending and segmenting before English-speaking children do (Anthony et al., 2011) due to the salience of the syllable as a phonological unit.

The PA abilities at the beginning of the developmental sequence have been referred to as basic meta-phonological skills (Gorman & Gillam, 2003), non-analytic PA (Carrillo, 1994), and syllable and onset-rime awareness (Cisero & Royer, 1995). However, all of these labels describe the PA skills of rhyming, sound matching, syllable awareness, and onset-rime awareness. Carrillo (1994) even takes a step further to say that these skills comprise a basic meta-phonological ability that underlies PA and gives way to decoding abilities in pre-readers. The more advanced PA skills of blending, phoneme segmentation and reversal, deletion, and sound-letter identification fall under the titles of segmental awareness (Gorman & Gillam, 2003), analytic PA (Carrillo, 1994), and phonemic awareness (Cisero & Royer, 1995). Rhyme and syllable awareness can precede formal instruction, but segmental awareness seems to develop after some kind of alphabetic exposure or instruction (Carrillo, 1994). In support of such a pattern, Carrillo's study found that rhyme and alliteration tasks were easiest and deletion and segment reversal tasks were most difficult for kindergartners (Carrillo, 1994).

The development of segmenting abilities, however, has caused some controversy in existing literature. For example, in her study of kindergartners and first graders in mainstream and bilingual classrooms in Spain, Carrillo (1994) yielded conflicting results about the timing of segmenting skills. On one hand, early readers performed significantly better than pre-readers on segmenting tasks, suggesting that basic segmenting abilities may therefore act as proximal precursors to the beginning of reading. At the same time, however, some pre-readers did have segmenting awareness and some kindergarten readers with sufficient skill still lacked segment awareness when evaluated a second time (Carrillo, 1994), so it may be true that analytic PA abilities can emerge before reading and may vary greatly, perhaps depending upon type and quality of preschool instruction, home language environment or whether or not a child gains alphabetic exposure through being read to. Regardless of exact timing, segment awareness was achieved among first graders in Carrillo's study, but even the best readers still struggled with deletion and segment reversal tasks (Carrillo, 1994), confirming that these advanced tasks indeed belong at the end of the PA developmental pathway.

Upon discussing the proposed sequence of PA development in English and Spanish, it seems appropriate to introduce a debate in the field of SEB phonological awareness research: Do cognitive abilities for more sophisticated PA skills (i.e. initial and final phoneme detection) develop in response to direct experience with these tasks? Are PA abilities independent of one another, or is there a developmental progression from basic to advanced skills in which competence in basic PA skills must be achieved in order to give way to more advanced skills?

Empirical evidence seems to support a developmental progression rather than independent abilities that require explicit experience: In Cisero and Royer's (1995) investigation of PA skills, kindergartners and first graders in mainstream and bilingual classrooms in

Massachusetts performed best on basic rhyming tasks and worst on advanced tasks like final phoneme detection. Also, mainstream children and bilingual first graders made more gains between assessment periods on phoneme tasks than on rhyming tasks, suggesting that improvements can only be made to abilities that are not yet mature, and that, by first grade, rhyming abilities for the most part, are fully developed (Cisero & Royer, 1995). A finding of particular interest to the SEB preschool and kindergarten population is that kindergartners in bilingual classrooms did not make any gains in task performance between evaluations (Cisero & Royer, 1995), suggesting that SEB kindergartners' competence in rime awareness had still not been achieved to the point where the next most difficult PA skills could develop (Carrillo, 1994). Conclusions from this debate and empirical evidence suggest PA follows a developmental progression in which more advanced skills build upon competent basic skills, and that this progression may be slower in SEB children than in their monolingual classmates.

Support for the developmental progression of PA allows for the inference that PA may be a trait of heterotypic continuity, which is defined as a trait comprised of various skills that emerge across development that are all indicative of the same underlying characteristic (Anthony et al., 2011). While direct research of heterotypic continuity does not exist for Spanish PA, there is strong evidence of heterotypic continuity in English (Anthony et al., 2011); given the assertion that PA sequences are similar in Spanish and in English, it may be accurate to say that PA is a domain that exhibits heterotypic continuity in Spanish. However, this statement should be interpreted with caution, as it extrapolates from other findings.

*The role of cross-linguistic transfer.* A unique feature of PA, and one that is of particular interest for the SEB population, is that of cross-linguistic transfer. This characteristic of PA is supported by Cummins' (1979) Developmental Interdependence Hypothesis, which is the idea

that skills from one language influence development of a second language. Similarities between PA development in two languages suggest that PA abilities can and will transfer between these languages (Cisero & Royer, 1995). As previous research has highlighted, PA development in Spanish and English is highly similar, so it can be inferred that cross-linguistic transfer is present in the PA development of SEB children. The relevant question when developing the S-IGDIs, then, is how well Spanish PA skills transfer to assist in English literacy achievement (Gutierrez, Zepeda, & Castro, 2010). Evidence for cross-linguistic transfer of PA is outlined here.

When evaluating English word reading abilities in SEB first graders, Durgunoglu and colleagues (1993) found that children who performed well on segmenting, blending, and initial sound matching tests in Spanish were able to read more English words. Similarly, among SEB children in kindergarten through second grade whose language of instruction was Spanish, children who performed better on Spanish PA tasks in the fall (and whose English skills were weak) performed better on English word recognition tasks in the spring than their counterparts with poorer Spanish PA skills (Cardenas-Hagan et al., 2007). In other words, Spanish PA skills transfer to benefit English word recognition skills in the early elementary grades, especially when Spanish is a child's stronger language.

In light of these positive findings, cross-linguistic transfer of PA skills may be considered a bilingual advantage. For example, bilingual children tend to perform better on PA tasks when one of their spoken languages has a transparent orthography, a simpler phonological structure, and/or a salient segmental unit. Spanish has all three of these characteristics. Furthermore, according to bilingual facilitation theory, bilingual children attend more to the structural features of language in response to "inter-lingual interference" (Kuo & Anderson, p. 369), and this interference may increase salience of structural similarities and differences between the two

languages. Thus, PA in bilingual children should progress more quickly than in monolingual children because bilingual children gain more experience with phonological units. Also, the structural similarities that do exist in Spanish and English should help to improve PA skills due to the mere fact that similarities signify less new language knowledge to be mastered (Kuo & Anderson, 2010).

However, not all findings related to cross-linguistic transfer of PA seem to benefit SEB children's PA development and English reading achievement. By testing traditional classroom SEB first graders' PA skills in their non-native language, Cisero & Royer (1995) found that due to the order of developmental progression and the developmental age of the children, phoneme detection performance (but not more basic PA abilities) in L1 transferred to L2. This result suggests that, because phonemic awareness was still developing, the presence of cross-linguistic transfer was able to be identified, while cross-linguistic transfer of rime awareness could not be perceived because of the children's advanced competence of this PA ability according to the developmental progression previously described. Of course, the lack of transfer of rime awareness could also be explained by the fact that rime awareness does not have as much salience or utility in Spanish. However, in bilingual classrooms, correlations between L1 and L2 performance were strongest for rime tasks, suggesting that children in these classrooms were delayed as compared to their traditional classroom counterparts (Cisero & Royer, 1995). Carrillo (1994) also found a delay in bilingual kindergartners' PA development as compared to that of monolingual kindergartners. Finally, the cross-linguistic transfer found by Cardenas-Hagan and colleagues (2007) was conditional: when language of instruction was English, Spanish PA skills in the fall did not significantly benefit English PA skills in the spring, which is an unsettling

finding because this is the instruction situation in which most SEB children actually find themselves.

These divergent findings bring to light the question of whether cross-linguistic transfer for SEB children's PA development actually gives these children a bilingual advantage. It is obvious from previous research that the cross-linguistic transfer of PA skills in Spanish and English is real, but whether or not it is an effective phenomenon for improving SEB children's later literacy skills as compared to other student groups is still unclear. Regardless, measuring SEB children's PA development is not only informative for Spanish literacy but also for English reading and academic achievement predictions (Anthony et al., 2011).

*Suggestions for item development and achieving equivalence.* A great deal of literature exists that will help to inform item development decisions. To begin, it may be useful to eliminate item types that will be less effective in assessment of SEB preschool-age children. For one, researchers have found that elision items may not be developmentally appropriate for this age group (Carrillo, 1994; Gorman & Gillam, 2003). Analyses by Branum-Martin and colleagues (2006) unveiled that limited English proficiency kindergartners' performance on Spanish elision tasks was less informative of general PA ability than were other PA skill tasks (i.e. blending non-words). Elision also scored lowest on construct validity in their analyses. With these findings, it may be safe to say that sound deletion items should not be included in the S-IGDIs.

Another potentially ineffective item characteristic is the incorporation of multi-syllable, compound vocabulary words when evaluating PA performance. While using compound words in English PA tasks actually facilitates correct answers, using Spanish compound words in segmenting items actually may make the items more difficult: Spanish content words often

already contain several syllables, so to use compound words would be to approximately double the syllable count, likely overwhelming the SEB child. As such, research has recommended the use of longer Spanish vocabulary words only in contexts where the polysyllabic word is more familiar and/or more culturally relevant than a shorter word (Anthony et al., 2011).

Anthony and colleagues (2011) also asserted that all word structures should be able to be used to measure the same range of Spanish phonological ability without altering item difficulty (in other words, an item that asks a child to blend phonemes should not be any more difficult than one that asks a child to blend syllables) but they also found that performance on items involving syllables was more informative in identifying individual differences in PA abilities than on items involving phonemes. Furthermore, word structure does affect item difficulty in English (Anthony et al., 2011), so, given the identified similarities in PA developmental progression between English and Spanish, it seems that more sophisticated word units (like phonemes) should present a higher level of difficulty. The type of task (multiple choice vs. free response) has also been found to influence difficulty in Spanish in addition to level of word unit (Anthony et al., 2011).

These findings suggest a series of features that may be best suited for measure development. Anthony and colleagues (2011) propose that it may be best to have all items involve manipulation of syllables, but to test syllable manipulation via a variety of tasks (i.e. blending, segmenting, and sound identification of syllables). In other words, it seems effective to use one level of linguistic complexity evaluated by tasks that vary in difficulty. The type of test, rather than the phonological unit, is what will poise some items to have the potential to require higher levels of ability. The use of multiple tasks should be more helpful to researchers and educators in the identification of children with delayed PA abilities.

In sum, the PA items that should be considered for the S-IGDIs should involve blending, sound identification, and segmenting of syllables using culturally appropriate, two-to-three-syllable vocabulary words (Gorman & Gillam, 2003; Anthony et al., 2011; Carrillo, 1994; Branum-Martin et al., 2006). In particular, initial and final sound identification are developmentally appropriate for preschool children and are strong predictors of reading ability in the early elementary grades (Gorman & Gillam, 2003), so it seems necessary to include this type of task when constructing PA measures. Gorman and Gillam (2003) also suggested a few intriguing testing ideas, such as asking children to segment a word into the smallest pieces they can rather than explicitly asking for segmentation of syllables as an attempt to gauge SEB children's skill level to see if it matches the developmental progression outlined in the literature. This strategy may be of interest in pilot testing to determine its effectiveness and to inform the decisions made for the final version of the S-IGDIs.

In addition to using empirical evidence to choose PA item types, Peña's four tenets of equivalence must be taken into account to ensure sound assessment design. To satisfy linguistic equivalence, it may be best to begin by using direct translations of the vocabulary words used in the English IGDI 2.0, but then to replace words with ones that are more culturally relevant where necessary in order to practice cultural equivalence. Functional equivalence will be satisfied by using the syllable as the phonological unit for all Spanish items, while using onset-rime patterns for English items, as syllable awareness in Spanish is salient in the way that onset-rime awareness is in English. PA items on the S-IGDIs will be functionally equivalent because they will be mindful of the types of items that best represent PA development for SEBs rather than for monolingual English speakers, resulting in assessment items that measure the construct of PA in ways that match and complement the English IGDI 2.0. Finally, metric equivalence

requirements will be met by comparing the range of item difficulty on the English IGDIs 2.0 and employing the Rasch measurement model to achieve a similar scale for S-IGDIs.

### **Oral language**

Oral language (OL) abilities are especially heterogeneous and varied in the SEB population due to children's differential timing and amount of exposure to Spanish and English (Hammer, Lawrence & Miccio, 2008; Peña, Bedore & Rappazzo, 2003; Peña & Halle, 2011). While some studies question the usefulness of OL skills in predicting literacy outcomes, other research asserts that the biggest issue for OL is not whether it predicts literacy, but rather whether the skill level achieved in the SEB population reaches national population norms and predicts literacy that also reaches that standard. Before diving into these issues, however, it is essential to begin at the basic level of defining the domain of OL.

*Defining oral language.* The term 'oral language' encompasses a variety of skills relating to the understanding and production of spoken words. Miller, Heilmann, Nockerts, Iglesias, Fabiano, and Francis (2006) summarize OL as "language used for communicative purposes" (p. 30) and conclude that language performance abilities include syntax, narrative structure, and vocabulary diversity. OL is also described as a suite of "literacy-related skills...expressed in vocabulary and language recall skills" (Paez, Tabors & Lopez, 2007, p. 86) and is sometimes considered independent from more traditional early literacy skills like PA (Paez et al., 2007). Peña, Bedore, and Rappazzo (2003) make a point to include semantic abilities as part of OL. Similar to the definition of PA, it also seems appropriate to combine these pre-existing definitions of OL in order to create a comprehensive representation of OL.

*Therefore, oral language is the ability to use words to communicate thoughts and ideas to other, and in turn, understand ideas and thoughts from others (Dunst, Trivette, Masiello, Roper, & Robyak, 2008; Morgan & Meier, 2008). Where expressive language is the use of words to express meaning and receptive language is the ability to listen, process, and understand the meaning of spoken language.*

Within the overarching construct of OL lie several ‘sub’-constructs that are often the subjects of OL assessment tasks. These abilities include global syntactic ability, vocabulary skills, fluency, and narrative structure. Global syntactic ability is measured by mean length of utterance (MLU). Vocabulary skills are the focus of the majority of OL assessments, and are measured by number of different words (NDW) when explaining a concept or retelling a story. Evaluating a child’s vocabulary is very useful for identifying language disorders. Fluency, an ability of special interest for second language learners, is measured by words per minute (WPM). Speaking rate is positively correlated with L2 proficiency. Finally, children’s narrative structure abilities, or skills related to producing a coherent story, can be measured via story grammar analysis, which evaluates child’s ability to tell a story that includes pieces that are seen as required for producing a coherent story (i.e. setting, initiating event, plan, attempt, consequence, resolution) (Miller et al., 2006).

In order to tap into these ‘sub’-constructs of OL, researchers have used two major types of assessments: *decontextualized assessments* (standardized tests) and *contextualized measures* (listening and speaking tasks) (Miller et al., 2006). A common decontextualized assessment is the *Peabody Picture Vocabulary-IV* and its Spanish complement *Test de vocabulario imagenes-Peabody* (Dunn et al., 1986 and 1997 in Hammer, et al., 2008). Another well-known standardized test for evaluating OL skills is the *Woodcock Language Proficiency Battery-*

*Revised* (Woodcock & Muñoz-Sandoval, 1991 in Mancilla-Martinez & Lesaux, 2011). Most of these tasks involve picture naming, which is the task used to measure OL in the English IGDIs 2.0. Other OL measures can be standardized or contextualized, including semantic tasks like *associations* (analogies), *categorizations* (grouping or naming words that fall into the same category), *functions* (showing or explaining how an object is used), *similarities and differences* (comparing, contrasting, and explaining relationships between objects), *characteristic properties* (listing characteristics of an object), *linguistic functions* (tasks that demonstrate understanding of relational words, prepositions, locations, etc.) (Peña et al., 2003). Sentence memory tasks are also important when evaluating OL skills, as language memory influences the ease with which a child can recall another person's oral language and respond accordingly (Mancilla-Martinez & Lesaux, 2011). Unfortunately, bilingual children tend to score lower on OL skill measures than do monolingual children (Peña et al., 2003), which is an issue worth investigating as it has critical implications for the population of interest for the Spanish IGDIs.

*Current state of research.* On the surface, it seems as though researchers stand divided regarding the effectiveness of OL abilities in predicting early and later literacy. For example, Durgunoglu and colleagues (1993) stated that OL alone is not a reliable antecedent of word recognition in English, while Miller and colleagues (2006) called the ability to produce oral language to communicate “the gold standard of language knowledge” (p. 31). The National Early Literacy Panel (NELP) contradicted itself when discussing OL's importance: they concluded that OL skills are a moderate to strong predictor of early literacy, but also discussed findings in which OL skills were weak predictors of later reading skills and were less informative than PA skills (Gutierrez et al., 2010).

However, Gutierrez and colleagues (2010) conclude that it is misguided to downplay the role of OL in literacy development, declaring that OL is indeed a predictor of learning to read. It is well-documented that children with better OL skills gain literacy more quickly than do children with poor OL skills (Miller et al., 2006). Thus, OL skills should be seen as predictive of literacy acquisition and later literacy outcomes (Paez et al., 2007), including reading difficulty or disabilities (Miller et al., 2006). Poor vocabulary prevents children from achieving adequate comprehension skills, so it is important to build expressive and receptive vocabularies early (Mancilla-Martinez & Lesaux, 2011). Research that supports OL as a literacy predictor will be discussed in this section while focusing on the major challenges faced by the SEB population when attempting to gain proficiency in OL skills. These challenges are (1) English OL and early literacy begin at school entry for many of these children, (2) characteristics of the home and language environment, including parental language knowledge, community use of English and Spanish, poverty, amount and quality of input in each language (Peña & Halle, 2011) contribute to OL skill achievement, and (3) while SEB children do learn to read, their OL skill performance repeatedly falls below the national average (Mancilla-Martinez & Lesaux, 2011).

Before addressing the issues related to OL for SEB children, however, it is important to understand how OL skills develop, are characterized, and manifest in the population of interest for the S-IGDIs. Miller and colleagues (2006) split OL into two broad categories: local structure, which includes “utterances with varying levels of syntactic complexity” (p. 31), and narrative structure, which is described as a more global ability to express a story in a structured manner. Research suggests that lexical representation of L2 vocabulary occurs in the same way that it does for L1, expanding in breadth and depth as children gain more language knowledge (Peña et al., 2003). When children learn a new word, they must revise their existing lexical

representations to include this new word (i.e. refine meanings of known words in light of the new addition, place new word in representational categories of function, characteristics, etc.). As children gain more language exposure and proficiency, they become increasingly able to place new words in more sophisticated, meta-linguistic categories (i.e. color, shape, size) and understand relationships between words (i.e. comparing and contrasting). This process is the development of semantic knowledge, which is critical to OL development as it helps children become able to verbally convey their thoughts (Peña et al., 2003).

While lexical representation and restructuring seem to be language-general, lexical frequency is language-specific (Peña et al., 2003). Findings like these support the necessity of the S-IGDIs rather than the mere translation of the English IGDIs 2.0. Word frequency is influenced by two factors: prototypicality and linguistic structure. Prototypicality is the extent to which a word is familiar based on familiarity with objects they represent. Of particular interest for the SEB population is the role played by cultural familiarity, as any given object may be more or less familiar for speakers of different languages. Linguistic structure relates to syntax and grammar rules that vary by language. For example, verbs in Spanish can be used without stating a subject, while in English stating the subject of a verb is required. This structure may make pronouns and relational words less frequent in Spanish than in English. Further, verbs are a greater focus in Spanish language input, whereas nouns are more emphasized in English. Nouns are more likely to occur in the final position of a sentence in English, while nouns and verbs are equally likely to end sentences in Spanish (Peña et al., 2003). Spanish's emphasis on verbs may be explained by the collectivistic attitude of Spanish culture, in which interaction occurs for a specific purpose (Peña & Halle, 2011). Indeed, the focus of conversations in Spanish is often about actions unshared by the two speakers rather than reiterating past shared

events and emphasizing object names as is frequently done in English parent-child interactions (Peña et al., 2003). As a result of language-specific prototypicality and linguistic structure, known vocabulary categories for SEBs may differ by language based upon the settings in which each language's input is gained (i.e. school words in English if a child attends an English-speaking preschool, home/daily life words in Spanish when Spanish is spoken at home) (Peña et al., 2003).

Unlike in phonological awareness skill development, SEB children cannot rely on cross-linguistic transfer to aid in the development of OL abilities, as measures of OL proficiency best predict within-language phonological awareness skills and reading outcomes (Miller et al., 2006; Paez et al., 2007). When Miller and colleagues (2006) tested Spanish and English story retelling abilities of SEBs in kindergarten through third grade transitional education classrooms (meaning that instruction was in Spanish but gradually transitioned to English as children's skills improved), they found that OL skills of syntax, fluency, and narrative structure best predicted within-language passage comprehension and word reading efficiency. While they did find slight evidence for cross-linguistic relationships that aided in the opposite language's word recognition efficiency, the within-language OL-reading relationships were much stronger (Miller et al., 2006).

Only after understanding the characteristics of OL skill development can the issues unique to SEB children be considered. In terms of developing OL and subsequent literacy, SEB children are a difficult population to evaluate due to their varying language backgrounds. Existing research findings imply that sequential SEB children may be at a particular disadvantage, as their English OL skills can only begin when formal instruction begins and they must learn English at an accelerated rate in an attempt to catch up to peers (Mancilla-Martinez &

Lesaux, 2011). Similarly, when comparing simultaneous and sequential SEB Head Start children, Hammer and colleagues (2008) noted that sequential SEBs began Head Start with a lower baseline English receptive vocabulary than did simultaneous SEBs, learned English vocabulary faster than did simultaneous SEBs, but still did not close the gap in receptive vocabulary performance throughout the two-year study. Further, a cross-sectional study by Oller and Eilers (2002, from Hammer et al., 2008) found that sequential SEB bilinguals performed equal to or worse than simultaneous SEB bilinguals on OL tasks.

However, being a simultaneous bilingual may not provide an advantage, either; even when children are exposed to English before school, the quality and quantity of input still comes into question (Peña & Halle, 2011). Oller and Eilers' cross-sectional study also found that both bilingual groups had lower receptive vocabulary than the monolingual English group (Hammer et al., 2008), suggesting that the timing of English exposure may not make much of a difference in terms of growth in English receptive vocabulary size and ability. Also, both groups of SEBs in the Head Start study experienced growth in English receptive language abilities but still fell below monolingual English standards. An interesting advantage for sequential SEB Head Start children is that they experienced more growth in Spanish receptive vocabulary than did simultaneous SEB children (Hammer et al., 2008), probably because sequential SEB children are more likely to continue speaking Spanish at home.

To add to the challenge to OL skill development posed by the timing of English exposure, SEB children's Spanish skills may experience attrition when exposure to English begins at school because fewer opportunities are presented to use and hear Spanish (Miller et al., 2006). Paez and colleagues (2007) found that English OL skills surpass Spanish OL skills by the end of pre-kindergarten even though SEB children generally do not make statistically significant

gains in English OL or reading skills during this time. Attrition findings are not completely convergent, however, as some studies conclude that Spanish OL skills continue to improve over time as Spanish exposure continues in the home (Miller et al., 2006).

Another component of bilingual OL development to consider is the developmental growth trajectory. According to Hammer, Lawrence, and Miccio (2008), OL development is exponential in children from upper and middle class families, but linear in children from lower socioeconomic statuses. This difference in developmental course could be due to risk factors that often accompany bilingualism, including a lower amount or quality of language input and less advanced maternal language and literacy skills. While many studies have found this pattern (Mancilla-Martinez & Lesaux, 2011), Hammer and colleagues (2008) caution that more research must be completed before concluding that low SES bilingual children always experience linear OL growth.

Perhaps the most relevant and troubling issue related to OL skill achievement in SEB children is the fact that these children continually perform significantly below the population mean on OL tasks in both languages (Paez et al., 2007). When comparing SEB Head Start children in Maryland and Massachusetts to monolingual Spanish-speaking Head Start children in Puerto Rico, differential gains in OL skills were observed for both groups of children, but neither group's improvements reached monolingual population means (Spanish means for Puerto Rican children, Spanish and English means for American SEBs). Monolingual Spanish-speaking children also outperformed SEB children in Spanish vocabulary and sentence memory, suggesting that monolingual children's Spanish OL skills were stronger than the SEB's Spanish OL skills after SEB children had one year of English Head Start. Conclusions to draw from this study are that the language of pre-kindergarten instruction influences OL skill development and

that, regardless of any gains made, SEB and monolingual Spanish-speaking children still fall below age-appropriate means in monolingual populations (Paez et al., 2007).

Mancilla-Martinez and Lesaux's (2011) longitudinal study that followed SEB children who primarily spoke Spanish at home from ages 4.5 to 11 drew conclusions that generally support this pattern of making OL gains but not reaching the average national level of performance. At the beginning of the study, children's short-term language memory was similar in both languages and their English vocabulary was already stronger than their Spanish vocabulary. By the end of the study, children's English OL skills were significantly better than their Spanish OL skills, and English language memory improved more than did this ability in Spanish. Despite gains in English OL skills, vocabulary growth and language memory levels were still below the national norm. Spanish OL skills at age 11 were not even equivalent to a 4.5 year-old monolingual's OL skills, which is three times below the national average. Interestingly enough, however, English word reading abilities mapped perfectly onto national norms. This finding is strange and should be interpreted with caution considering the "developmental lag" (p. 1556) experienced in OL skills in both languages, but provides hope that SEB children may still be able to achieve on-par reading levels even with below average OL skills (Mancilla-Martinez & Lesaux, 2011).

Regardless of exact performance levels of each SEB child, the overwhelming theme to be extracted from extant OL research is that, as a population, SEB children's OL skills are particularly variable and that this variation may be responsible for these children's lower OL skill levels as compared to their monolingual counterparts. However, Peña and Halle (2011) mention an important consideration for future research and assessment of OL and reading: it is possible that SEB children fall below the national norm for OL skills for monolingual children

because this norm should not be extrapolated to or expected of children who are not monolingual.

*Suggestions for item development and achieving equivalence.* Building off of Peña and Halle's critique of using monolingual norms to label SEB children's OL and reading skills, it seems important to point out the flaws in past and current assessment efforts so that the S-IGDIs can avoid these mistakes. Most existing measures of Spanish OL skills (i.e. Test de vocabulario en imagenes Peabody, Dunn et al., 1986) were designed for monolingual Spanish speakers in Spain and Mexico, so using them to evaluate the abilities of SEB children in the U.S. may not be accurate (Peña et al., 2003). Basing conclusions about SEB children on results from assessments that were not specifically designed for this population threatens test validity (Peña & Halle, 2011). Furthermore, tasks designed for monolinguals of either language may not be representative of SEB children's performance, as SEBs likely have incomplete language knowledge in both languages (i.e. began learning English before Spanish linguistics and vocabulary were mastered) (Peña & Halle, 2011). Future assessments must be responsive to these potentially varying OL abilities.

Although existing assessments have their drawbacks, their development and use has laid the groundwork that can assist researchers in choosing the most effective and representative task types and assessment structures. For vocabulary-based tasks, picture naming tasks are especially robust in measuring OL skills and predicting literacy (McConnell et al., 2010) even though they only evaluate word recognition abilities and do not take into account the role played by semantics in OL development (Peña et al., 2003). Peña and colleagues (2003) evaluated SEB 4-7 year olds' performance on a variety of expressive and receptive semantic tasks. In Spanish, the easiest tasks (the tasks on which children performed the best) were functions and receptive

characteristic properties. In English, the easiest tasks were receptive similarities and differences and expressive functions. The most difficult tasks (the tasks on which children scored the lowest) in both languages were expressive associations, expressive characteristic properties, and linguistic concepts. All receptive tasks were generally easier than expressive tasks, as evidenced by higher scores on tasks that did not require expressive responses. In general, performance in both languages was similar (Peña et al., 2003). Another potentially effective OL task is immediate sentence recall, which has been found to be strongly correlated with reading achievement because they tap into syntactic and semantic knowledge simultaneously (Mancilla-Martinez & Lesaux, 2011).

In terms of assessment structure, it is important to keep a few points in mind. First, not all children exhibit their knowledge in a similar fashion, so tasks should be varied to account for the different ways in which OL knowledge can be displayed (Peña & Halle, 2011). Second, it is very likely that performance on language testing will be different for each language (Peña et al., 2003), so it seems most suitable to develop a measure that will evaluate proficiency in both languages to document the clearest picture of a child's OL ability (Miller et al., 2006; Peña & Halle, 2011). Third, the influence of cultural and linguistic familiarity on word knowledge must be considered (Peña et al., 2003), as children from diverse cultural backgrounds will likely perform differently on assessments developed for mainstream American culture (Peña & Halle, 2011). Finally, Peña and Halle (2011) argue that a separate norm for bilingual children should be set that accounts for the timing, amount, and quality of exposure to each language, and the contexts in which the child learns each language. A unique standard of this type will help to assess overall abilities rather than solely which abilities a child possesses in each language.

Suggestions for designing an appropriate OL assessment for young SEB children stem from understanding the drawbacks that have plagued assessments in the past and the unique considerations for the bilingual population. An important characteristic for an OL measure is to evaluate the children in both languages, as having a child talk about the same content in both languages makes it easy to directly compare oral proficiency via narrative ability and vocabulary use (Miller et al., 2006). However, as a decontextualized test such as story retelling may not account for the between-language differences in known vocabulary categories, eliciting the most accurate level of OL skill performance may come from contextualized interactions (Miller et al., 2006). Another way to measure both languages could be to allow children to respond in whichever language is more accessible for each item and then develop a standardized summary score of their OL abilities rather than isolating abilities in each language (Peña & Halle, 2011). Additionally, in order to account for the varied ways in which children can demonstrate their OL knowledge (Peña & Halle, 2011), it may be necessary for task type on the S-IGDIs to differ from the picture naming task used on the English IGDIs 2.0. However, given the documented strength of picture naming as an OL task type that predicts literacy, it may be even more effective to add an OL task to each language's assessment in order to widen the scope of OL evaluation in an equal manner. For instance, it could be useful for this additional task to be based upon tasks in which performance in Spanish and English is similar (e.g. categorization of words) (Peña & Halle, 2011). Of course, adding a new OL task to the measures brings up the question of whether or not simply using a variety of tasks will sufficiently and systematically account for differences in how children can express their understanding of OL.

As with PA items on the S-IGDIs, it is critical to be mindful of Peña's four tenets of equivalence. For linguistic equivalence, it is just as important for task directions to be

linguistically equivalent as for item words, because if SEB children do not understand what is expected of them in a task, it will most certainly misrepresent their actual skill level (Peña & Halle, 2011). For example, if a directly-translated verb does not carry the exact same meaning in both languages, a more descriptive Spanish verb must be used in order to convey the same direction. Also, when using a single-word vocabulary test (like picture naming on the English IGDIs 2.0), it may be best to focus vocabulary on verbs rather than nouns due to the verb-heavy focus in Spanish (Peña et al., 2003). In terms of functional equivalence, task types that differ from those that measure OL on the English IGDIs 2.0 may not need to be developed, as no task type seems to significantly vary in difficulty between languages (Peña et al., 2003). Achieving cultural equivalence will involve being mindful of interaction patterns or purposes that may be different from what Spanish-speaking children are used to in their homes. For example, as interactions in Spanish are driven by a specific purpose to gain new information rather than to simply to converse for fun, an SEB child may be confused about the purpose of an interaction in which the examiner already knows the answers to the questions being asked. This confusion may lead to task performance that underestimates their actual OL skill level (Peña & Halle, 2011). Finally, metric equivalence will be met by performing Rasch model analyses that will ensure that the range of item difficulty is consistent in both languages. These analyses will be especially useful when considering the addition of an OL task, as the resulting numerical values will reveal whether or not this additional task is necessary or scientifically sound.

### **Alphabet knowledge**

Of the three domains in question, alphabet knowledge (AK) for SEBs is the least researched. The majority of completed AK studies relate to the development of AK in English-speaking children, and the degree to which the results can generalize to Spanish-speaking

children is unclear given the similarities and differences that exist between the two languages.

Relevant findings for English-speaking and SEB children will be presented and implications for

SEB preschool-age children will be discussed in hopes of developing a clear enough

understanding of AK development in order to develop pilot items for the S-IGDIs.

Unfortunately, this small research base may leave some important questions unanswered in terms of how to best design an equivalent assessment when existing evidence is not fully informative.

As with PA and OL, however, it seems most logical to begin at the basic definitional level of AK.

*Defining alphabet knowledge.* From existing sources, it seems as though researchers agree upon what ‘alphabet knowledge’ really is. McBride-Chang (1999) described AK as the “knowledge of names and sounds made by letters of the alphabet” (GET PAGE #). AK has also been referred to as the “understanding that language can be represented symbolically through writing” (Davison & Brea-Spahn, 2012, p. 253). Davison and Brea-Spahn (2012) also refer to AK as an ‘inside-out’ emergent literacy ability, meaning that AK is an internal process that transfers to an external context of reading. As was the case for PA and OL construct definition development, the most comprehensive definition of AK can be formed by combining these existing definitions. ***Thus, alphabet knowledge is knowledge about the names, sounds, and symbolic representation of the 27 letters of the alphabet*** (McBride-Chang, 1999; Davison & Brea-Spahn, 2012).

The most frequently available measures of AK skill level represent *letter naming* and *letter-sound identification* tasks (McBride-Chang, 1999). Letter-name identification is evaluated via tasks that ask children to select a particular letter (e.g. “Point to the letter ‘B’”) or that ask children to differentiate between letters and non-letter symbols (e.g. a swirl, a Greek letter, and

the letter 'D' are lined up in a row and children must identify which of these symbols is a letter in their language). Letter-sound identification tasks often overlap with PA sound/phoneme identification tasks. In general, letter naming tasks are easier than letter-sound identification tasks (McBride-Chang, 1999).

*Current state of research.* Perhaps due to the small body of AK research, a few debates and inconsistencies exist in the literature. These contrasting ideas will be outlined in an attempt to reach conclusions about how AK develops in SEB children and how to best evaluate AK in the S-IGDIs.

To begin, existing studies of AK in early childhood have reached different conclusions about when children gain knowledge of most capital letters. Researchers do agree that AK is variable in early childhood, as McBride-Chang (1999) presented this finding for English-speaking children and Dickinson and colleagues (2004) found this variability among SEB Head Start children. However, the timing at which this variability evens out is up for debate. For example, it is thought that most English-speaking children know all capital letter names by age 7 (McBride-Chang, 1999). In contrast, according to a nationally representative sample of Hispanic and Caucasian parents of pre-kindergartners, only half as many young Hispanic children as Caucasian children could name most letters (Dickinson et al., 2004). Of course, Dickinson and colleagues' result does not apply to 7-year-olds, so it is possible that Hispanic children catch up to Caucasian children in terms of letter naming ability as a result of formal AK instruction at school. On the other hand, Dickinson and colleagues' finding matches the overall pattern that SEB children perform worse than English-speaking children on early literacy measures (Garcia & Jensen, 2009). It seems, then, that the timing of AK development may not be grounds for debate at all. Unfortunately, not enough studies have focused their efforts on SEB AK

development and whether it falls below the monolingual norm as do so many other SEB early literacy skills.

Continuing with the inconsistencies in AK literature, McBride-Chang (1999) outlined a debate over whether letter-name and letter-sound skills are two overlapping abilities or two distinct abilities (McBride-Chang, 1999). In support of an ability overlap, many researchers collapse these abilities into one AK score when evaluating children. Furthermore, letter name knowledge is correlated with letter-sound knowledge when learning to spell. However, other studies find only modest correlations between the two abilities, thereby suggesting that letter-name and letter-sound knowledge are separate skills. In fact, one study found almost no relationship between letters that four- and five-year-olds could name and letters for which they could name the letters' sounds (McBride-Chang, 1999).

Both perspectives seem to agree that letter-name knowledge precedes letter-sound knowledge, but disagree over whether letter-name overlaps with letter-sound or whether the two abilities are completely separate. Before fully evaluating which viewpoint is more accurate, it is important to understand the development of both AK skills. In terms of letter-name knowledge development, learning letter names requires “mapping a visual symbol to a phonetic representation” (McBride-Chang, 1999, p. 288) and may be an easy task for young children, especially when learning letter names that sound like words they already know (e.g. *B, C, R, Y* in English) (McBride-Chang, 1999). Unfortunately, no research to specifically address letter-name development has been conducted for SEBs or for Spanish-speaking children, so it is difficult to say whether or not Spanish letter names that sound like Spanish words (if there are any) would be easier for Spanish-speaking children to learn. Letter-sound development may be much more difficult as it requires phoneme awareness, which arrives later in PA development. PA and AK

overlap in this manner, and this relationship will be further considered later. As letter-sound skill may be more advanced, this ability is more related to reading skills than letter-name knowledge (Davison & Brea-Spahn, 2012). In English, children use letter-name knowledge to learn corresponding letter sounds, and considerable evidence supports that such a pattern exists in different languages (Davison & Brea-Spahn, 2012).

In order to uncover nature of the construct of AK (including letter-name and letter-sound abilities), McBride-Chang (1999) evaluated general cognitive ability, PA (via phoneme elision and sound isolation tasks), letter-sound skills, letter-name knowledge, reading, and spelling skills of pre-reading, English-speaking kindergartners from a range of socioeconomic statuses over a 15 month period and found that letter-name and letter-sound abilities contributed unique variance to reading and spelling abilities. From this result, letter-name and letter-sound abilities seem to be separate yet related, and will be considered as such when developing the S-IGDIs.

Now that the state of relatedness between AK's two abilities has been identified, it is applicable to highlight the interconnected development of these two skills. McBride-Chang (1999) outlined a few patterns ranking skill development from easy to more difficult. First, children may learn the initial letters and sounds of the alphabet before they learn the end of the alphabet, as letter-name and letter-sound abilities are positively correlated with alphabetical order (McBride-Chang, 1999). Similarly, letter sounds that occur at the onset of a letter name are easier to learn than letter sounds that occur in the rime portion of a name, with letter sounds that do not appear anywhere in the letter name being the most difficult of all (e.g. *W*) (Davison & Brea-Spahn, 2012). This developmental pattern has not been well-researched in Spanish, however. Perhaps Spanish-speaking children find letter sounds in the first syllable of a letter

name easier to learn than letter sounds in subsequent syllables due to the salience of the syllable as a phonological unit (Durgonoglu et al., 1993).

Also, it is easier for English-speaking children to learn letter-name-sound relationships for consonants than for vowels (McBride-Chang, 1999), but this may not be true for Spanish-speaking children as Spanish orthography is more transparent and vowels do not correspond to as many different sounds as they do in English (Anthony et al., 2011). Similarly, consonant-vowel letter sounds (e.g. *B*) are easier to learn than vowel-consonant sounds (i.e. *S*), and obstruent consonants (those that most frequently occur at the beginning or end of a syllable) are learned more quickly than non-obstruent consonants (those that are typically present at the middle of a syllable) (McBride-Chang, 1999). Of course, not a lot of research directly investigating these concepts for SEBs has been done, and studies involving Head Start children find that Latino children leave Head Start with abilities that fall below the monolingual English norm (Davison & Brea-Spahn, 2012).

Two other issues to consider for AK development are the role of explicit instruction and the interrelatedness of PA ability and letter-sound knowledge. In McBride-Chang's (1999) study, English-speaking children began kindergarten with high variability in letter-name knowledge, but ended kindergarten on a similar developmental level, thereby arguing that explicit instruction of AK facilitates its development. While no studies suggest that formal AK instruction in Spanish would not be required in order for Spanish-speaking or SEB children to develop Spanish AK, no studies directly state that Spanish AK follows the same pattern as English of requiring explicit teaching. One study, however, did find a direct relationship between socioeconomic status and print exposure (Dickinson et al., 2004), implying that children from lower SES tend to have less print exposure that precedes formal schooling. While this

result focused on children from lower SES rather than SEB children, this finding could be potentially applicable to the SEB population as many of those children do come from economically disadvantaged backgrounds. For the purpose of S-IGDI development, then, it may be acceptable to infer that SEB children who will be assessed by the S-IGDIS may have less print exposure than English-speaking counterparts who will be assessed by the English IGDI 2.0, and that a lower baseline ability of AK may result.

Explicit instruction may be involved in achieving AK, but implicit cognitive processes like memory and PA development status also influence a child's AK level without formal instruction (McBride-Chang, 1999). Of particular interest to S-IGDI development is the link between PA and letter-sound ability. In McBride-Chang's study of English-speaking pre-kindergartners, letter-sound knowledge varied across all four time evaluations, suggesting that variability in existing PA abilities accounts for variance in letter-sound knowledge (McBride-Chang, 1999). PA development also allows children to link graphemes to phonemes (Dickinson et al., 2004), and this connection between PA and letter-sound awareness may facilitate spelling: in one study, Spanish-speaking first graders were able to use PA knowledge to spell short, simple words correctly regardless of familiarity level (Davison & Brea-Spahn, 2012).

Overall, the state of AK research for SEB preschool-age children lags behind the level of investigation devoted to PA and OL abilities in this population. Gaps in the literature aside, AK items on the S-IGDI must be mindfully developed.

*Suggestions for item development and achieving equivalence.* As it has been emphasized, AK research is far from vast. However, a few suggestions for item development were still provided by extant studies. For one, it may be most effective to use uppercase letters in tasks, as learning lowercase letters seems to occur late in kindergarten (McBride-Chang, 1999), a

landmark unreached by SEB preschoolers. Also, due to the fact that children may have greater knowledge of the letters at the beginning of the alphabet, letter-name and letter-sound abilities may be weaker for the letters at the end of the alphabet (McBride-Chang, 1999), so level of item difficulty may be able to be manipulated by mere letter choice. In addition, letter-sound tasks may take a similar form as phoneme identification PA tasks (McBride-Chang, 1999) (e.g. ¿Cuál sonido oye en \_\_\_\_ que no oye en \_\_\_\_?). Finally, previous versions of the English IGDIs 2.0 implemented a letter identification task that was too easy for English-speaking preschoolers. This task was removed, and the current English IGDIs 2.0 evaluate AK via a sound identification task that combines PA and AK skills (Greenwood, Carta, McConnell, Goldstien, Kaminski, 2008). Because existing research provides no way of knowing whether or not a letter identification task would be too easy for SEB children, it could be informative to pilot a task of this type on the S-IGDIs and subsequently remove it if it is indeed too easy for the children. However, perhaps letter identification should be left out completely in order to maintain equivalence between the English IGDIs 2.0 and the S-IGDIs.

In sum, the development of AK items may need to at least partially rely on inferences from English research because we do not fully understand the differences between AK in English and in Spanish or SEB populations. Although this initially may not seem like a highly systematic method for assessment development, Peña's equivalence tenets will still be actively employed in order to design the most robust items possible. Linguistic equivalence will not be difficult to satisfy, as English and Spanish are both alphabetic languages. The main steps to be taken in order to ensure linguistic equivalence will be to add *ch*, *ll* and *ñ* to AK tasks as these letters are unique to Spanish, and to translate all task instructions to reflect the same meaning on both assessments. Achieving functional equivalence will involve deciding whether or not to

include a letter identification task on the S-IGDIs and whether or not the sound identification task from the English IGDIs 2.0 will be appropriate for measuring AK equivalently in the SEB population. PA findings regarding between-language differences in PA development will be of interest here. Cultural equivalence will only be relevant in letter-sound AK tasks that utilize vocabulary words. In that case, vocabulary words from the English IGDIs 2.0 should be replaced by culturally salient vocabulary words for SEB children when necessary. As for the other two early literacy domains, Rasch model analyses will evaluate the degree of metric equivalence present in AK items.

### **Discussion**

The purpose of this literature review was to evaluate and discuss past and current research of phonological awareness (PA), oral language (OL), and alphabet knowledge (AK) in SEB preschool-age children in order to lay the evidence-based groundwork for the Spanish IGDIs. In general, more similarities than differences between English and Spanish in these three domains have been identified in the body of early literacy literature. The domains even overlap to some degree: vocabulary development (OL) assists in PA development, and phonological awareness (PA) helps with letter-sound knowledge (AK) (Dickinson et al., 2004; McBride-Chang, 1999). It seems, then, that development of all domains is facilitated by the domains themselves; it is a combined effort that propels children toward literacy.

However, the differences between early literacy development for monolingual English-speaking children and SEB children are important to highlight, as these points confirm the need for the S-IGDIs by providing implications for measure design. For PA, the main between-language difference is the salience of syllables in Spanish as compared to onset-rime patterns in English (Durgonoglu et al., 1993). In response to this dissimilar developmental sequence, PA

items on the S-IGDI should focus on the syllable as the phonological unit of interest in order to achieve functional equivalence to the English IGDIs 2.0. The primary issue for OL is that SEB children vary greatly in their Spanish and English exposure backgrounds (Peña & Halle, 2011; Hammer et al., 2008), which could possibly explain their failure as a population to meet monolingual English national standards (Mancilla-Martinez & Lesaux, 2011; Paez et al., 2007). The most important points to remember when developing OL items are to evaluate SEB children in both languages in order to account for bilingual status (sequential versus simultaneous) and that a national norm unique to SEB children may be worth researching (Peña & Halle, 2011). Between-language differences have not been identified for AK per se because the majority of AK research has focused on English-speaking children's development (e.g. McBride-Chang, 1999). The state of AK research in and of itself influences S-IGDI item development, as several AK item decisions will need to be made by using SEB PA research and AK research of an English-speaking population.

Upon developing, piloting, revising, and disseminating the S-IGDI assessment, SEB preschool-age children at risk for reading difficulties can be more effectively identified and placed into interventions following an RTI model. By evaluating these children before their formal schooling begins, teachers and researchers can more successfully prevent reading struggles and subsequent achievement issues rather than reacting to issues that have already manifested. This assessment can act as a springboard for future assessment efforts that systematically target the SEB population in hopes of eventually finding a way to bridge the gaps in literacy development and academic achievement between SEB children and monolingual English children.

**Table 1. *Pena's four tenets in the measurement context of SEB early literacy.***

	Phonological awareness	Oral language	Alphabet knowledge
Linguistic	Focus on syllables as the phonological unit of interest.	Focus on verbs in vocabulary tasks; word choice in task instructions will extend beyond direct translation	Include “ll” and “ñ”; Letter-sound identification tasks will follow documented developmental patterns regarding sound difficulty in each language
Functional	Spanish task types will inform same overall PA development level as English IGDIs	Keep task type consistent in both languages in order to ensure measurement of OL is consistent with English IGDI operationalization	Keep task type consistent in both languages in order to ensure measurement of OL is consistent with English IGDI operationalization; perhaps use letter ID task in pilot?
Cultural	Use of culturally relevant vocabulary words	Use of culturally relevant vocabulary words	Use culturally relevant vocabulary where necessary (if decide to use task that involves phoneme ID within words)
Metric	Complementary range of item difficulty; Rasch model analyses	Complementary range of item difficulty; Rasch model analyses	Complementary range of item difficulty; Rasch model analyses

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