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MAKING EVIDENCE-BASED ASSESSMENT DECISIONS FOR
CHILDREN WHO ARE INTERNATIONALLY ADOPTED

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Structured Abstract

Clinical Question: What is the best language assessment battery to determine if a second-grade student, who was internationally adopted (IA) at 36 months old, has language impairment?

Method: Scoping Review

Study Sources: ASHA.org, Cochrane.org, ERIC, IES What Works Clearinghouse, and PubMed

Search Terms: *adopt* and *international* and *language* and *reading*

Number of Included Studies: 21

Primary Results:
1) During the early years postadoption, measures of vocabulary and prelinguistic skills (vocalizations, gestures, early pragmatic skills) are used in determining those children who may be at an increased risk of language acquisition difficulties.
2) Language skills of children who are IA can be examined two to three years postadoption, using norm-referenced testing in conjunction with language/narrative sampling.
3) Although the majority of children who are IA do not experience language difficulties postadoption, some do. Some children appear to have difficulties when they reach the school-age years and more decontextualized use of language is required.

Conclusions:
1) At two years postadoption (and beyond), a complete assessment of a child who is IA may include norm-referenced testing, but it should also include naturalistic sampling. Length of exposure to English is an important consideration.
2) Monitoring language development of children who are IA well into the school-age years is prudent.

Making Evidence-Based Assessment Decisions for Children Who Are Internationally Adopted

Kathleen A. Scott
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Clinical Scenario

Natalie is a speech language pathologist (SLP) in a rural school district in a Midwestern state. Natalie has been working for the district for five years. Although her caseload is varied and includes several English language learner students, she has had limited experience assessing and treating bilingual children. The parents of Alison, a second-grade girl, have requested an evaluation because they see Alison struggling to keep pace in the classroom, particularly in reading. The second-grade teacher is also concerned about Alison's language and literacy skills. The teacher informally reported to Natalie that Alison's progress throughout the year has been slow. Alison did not receive special education services in kindergarten or first grade, but has received some additional classroom reading instruction in second grade from the reading teacher.

Natalie spoke with Alison's mother to obtain additional background information. Natalie found out that Alison was adopted from an orphanage in China when she was 36 months old. Upon her arrival in the US, Alison had a few minor medical issues. She was evaluated for early intervention services, but received none prior to school-age. Postadoption, Alison's parents report good health and no complicating medical issues during the preschool and early school-age years. Alison's mother reported that Alison appeared to use many English words soon after her arrival, and that her language showed good growth during her first three years in her new home. At 5 years old, upon entrance into kindergarten, Alison was evaluated by an SLP at her parents' request. The SLP found Alison's overall language skills to be in the low average range except for receptive vocabulary, which was in the moderately high range of ability. Articulation skills were good at that time and treatment was not recommended.

Natalie needed to determine if a full evaluation was warranted and, if so, what an appropriate assessment plan would entail. She also needed to make these clinical decisions quickly, due to her own schedule and that of her district.

Clinical Question

Natalie needed to develop a clear, diagnostic question that could be answered within an evidence-based framework. Because her question would be focused on assessment and not treatment, she needed to adapt the PESICO format (Hargrove, 2005; Schlosser, Koul, & Costello, 2005). Specifically, Natalie altered it to identify the client (population), environment, stakeholders, measurement tools for the assessment, possible alternate or additional measurement tools for assessment, and behaviors/outcomes of concern. She used the following format to develop her diagnostic question:

P: A girl, internationally adopted at 36 months, now 7 years old

E: Second-grade classroom

S: Student, teacher, and parents

I: Instrument(s) for identifying language impairment, with evidence of the accuracy of the instruments

C: Alternate or additional instrument for identifying of language impairment or no comparison

O: Rule in/out spoken and/or written language impairment

Natalie posed her question as, "What is the best language assessment battery to use to determine if a second-grade student, who was internationally adopted at 36 months old, has a language impairment?"

Background

The number of children adopted from foreign countries into the US has grown substantially over the last ten years (U.S. Department of State, 2010). Interest in how these children learn language has also increased, as evidenced by the growing number of studies that have examined early and later language skills of children who are internationally adopted (IA). Central to the discussion is that children who are IA are exposed to one language at birth, and then at the time of adoption, are exposed to a new second language. For the majority of these children, the first language to which they were exposed is no longer available to them in their new environment. Therefore, the children cannot be viewed as being true monolingual language learners, nor can they be viewed as being typical simultaneous or sequential bilingual language learners. This language-learning profile has prompted some researchers to refer to the language acquisition pattern as "second first-language learning" (Roberts et al., 2005).

According to Glennen (2008), most of the children who are IA present with rapid attrition of their first language and equally impressive gains in their new home language. It has also been found that when children are adopted before they are 2 years old, their acquisition of English generally parallels the patterns of typically developing monolingual English speakers (Jacobs, Miller, & Tirella, 2010; Roberts et al., 2005). There is converging evidence that by two years postadoption, the majority of children who are IA have acquired language skills that are comparable to their nonadopted peers. Questions persist, however, regarding whether or not these strong early language gains can be sustained as the children enter school and the language demands become increasingly more rigorous. In particular, as children get older, literacy skills become central to academic success, and such skills require foundational oral language abilities for both the decoding and comprehension of text (Roberts & Scott, 2006). Children also require mastery of an "academic language register" (Silliman & Scott, 2009) that enables them to comprehend a variety of texts in their curriculum.

Citing the Basic Interpersonal Communication Skills/Cognitive Academic Language Proficiency (BICS/CALP) proposal (Cummins, 1984), several researchers have proposed that these rapid early gains in language made by IA children may not be enough to support later language acquisition (e.g., Dalen, 1995). The Cummins' proposal states that early basic interpersonal communication skills (BICS) can be established rather well in young children when their use of language is for social purposes in everyday, routine, highly contextualized environments. CALP, on the other hand, are those cognitive academic language proficiencies that children must acquire to use language in a context-reduced environment, such as an academic setting. The question of whether children who are IA will achieve age-appropriate cognitive-academic language skills is a question that, in some ways, parallels the research on children who are bilingual or English language learners. An oft-cited statistic derived from Cummins' work (1981) is that CALP requires approximately 5 to 7 years of exposure to the school language, whereas conversational competence may occur within a few years of exposure to a second language.

However, the BICS/CALP model was originally conceived and applied to children who were from low socioeconomic backgrounds and whose parents had fewer years of formal education than parents of children who are IA. In this group of children, Cummins hypothesized, there would be a distinct disconnection between home and school language use (Cummins, 1984). Children who are adopted internationally, on the other hand, are in home environments where parents are reported to be older than biological parents, financially stable, and highly educated (Tan & Yang, 2005). Therefore, it is unlikely that children who are IA will experience great differences between home and school environments along these sociolinguistic lines. The Cummins proposal also operates with the assumption that both languages will continue to be available to the child, but for the majority of children who are IA, this is not the case.

Researchers investigating the long-term outcomes and cognitive academic language skills (CALP) are not in full agreement on whether children who are IA struggle with academic language proficiency in their school-age years. Several researchers have found that the oral and written language outcomes of the children continue to be good into the early school-age years (Scott, Roberts, & Krakow, 2008). Other researchers, however, have found that when children move into the more decontextualized language found in school settings, they struggle with using language for academic purposes (Dalen, 1995).

These latter findings are further supported by reports that high numbers of IA children are receiving speech-language therapy or special education services by the school-age years. In fact, some researchers reported figures as high as 62% of children who were adopted internationally have subsequent communication disorders (Beverly, McGuiness, & Blanton, 2008). Systematic reviews have documented a number of studies reporting both good and poor later language outcomes (Scott, 2009); however, a recent meta-analysis indicated that although some children who are IA do well during the toddler and preschool years, when language skills are examined during the school-age years, their language abilities are not comparable to those of their peers (Scott, Roberts, & Glennen, 2011). Taken together, these studies do not provide a uniform profile of the IA child's long-term language outcomes, but they do indicate a great variability in the language profiles across the children.

Natalie's case was complex because the child was both school-age and was older than 2 years when she was adopted. In fact, Alison had only 4 years of exposure to English by the time she was in the second grade. Alison's parents, as well as her classroom teacher, were expressing concerns regarding Alison's language development. Natalie knew her assessment of Alison's language skills would have important consequences and affect Alison's academic success.

Search for the Evidence

Information Retrieval Strategy

Prior to this experience, Natalie was unfamiliar with many of the language development issues among children who are IA. In order to better understand the language concerns of this group of children, Natalie searched ASHA.org and found an article that provided an overview of the language development and language issues of IA children (Glennen, 2008). The article and subsequent readings highlighted to Natalie that the language concerns of this group were not identical to those of the bilingual children that she had assessed. For example, she learned that most children adopted internationally were adopted by monolingual English speaking parents (Tan & Young, 2005), and experienced rapid attrition of the birth language (Gindis, 2005), with subsequent rapid

acquisition of the new home language (Krakow & Roberts, 2003). Researchers also reported patterns of language acquisition that parallel those of monolingual children (Snedeker, Geren, & Shafto, 2007).

However, there were some age of adoption effects in that older adoptees appeared to make faster progress than younger adoptees (Krakow, Tao, & Roberts, 2005) although they had a greater amount of language to learn in a shorter period of time (Glennen, 2009; Krakow, Tao, & Roberts, 2005). There was mixed evidence for cross-linguistic interference (Glennen, 2009; Glennen, Rosinsky-Grunhut, & Tracy, 2005). Collectively, these research findings indicate that language development of IA children is not directly comparable to that of bilingual children and IA children may face different language development challenges as a function of age at time of adoption. Natalie agreed that the child's age at the time of adoption was an important factor to consider, because it was directly linked to his or her length of exposure to the second first language. For many IA children, it was also tied to the time spent in an institutionalized living arrangement. Natalie acknowledged that examining the literature regarding assessment in general, or language acquisition in second language learners, would not clearly answer her question. She needed to find literature specific to the language assessment of IA children. After reading a brief article, Natalie selected the key terms for her search; "international adoption" and "language" and "reading."

Inclusion Criteria

To keep the focus targeted and pertinent to her question, Natalie decided on three inclusion criteria: the children in the study must be internationally adopted; the focus of the study must relate directly to language and literacy skill development; and the study must be published in a peer-reviewed journal. This effectively ruled out articles that examined the health, social-emotional, and other developmental issues of internationally adopted children, as well as articles in which the participants of the study were described as bilingual. In light of her time constraint, Natalie ruled out dissertations and theses.

Living in a rural area, Natalie did not have access to a university library, and she had limited access to full-text database searching at her local public library. Thus, she decided that she would develop a search strategy that would allow her to search free databases and return a good

selection of studies. Natalie returned to the ASHA website (www.asha.org) because, as a member, she had access to the peer-reviewed journals of the organization. She felt that those journals would have the most pertinent articles for her review. Using the advanced search features in the ASHA publications search, she selected the three most relevant ASHA peer-reviewed journals, *American Journal of Speech-Language Pathology*; *Language, Speech, and Hearing Services in Schools*; and *Journal of Speech, Language, and Hearing Research*; and three division Perspectives journals; *Perspectives on Communication Disorders and Sciences in Culturally and Linguistically Diverse Populations*; *Perspectives on Language Learning and Education*; and *Perspectives on School-Based Issues*.

Using the "abstract/title" choice, Natalie searched with the terms *adopt** and *international** and *language*, using the wildcard (*) to make sure the words *international* and *internationally* and *adoption* and *adopted* all appeared in her search. The search returned 14 hits, 13 of which were relevant. She tried substituting *reading* for *language*, but the search yielded no new hits. Natalie widened her search by using the free ERIC search engine, which includes a wide array of articles in the social sciences. She used the advanced search function and entered the same search terms she used previously; however, ERIC did not allow combined title and abstract searches, so Natalie typed *adopt** in the title, and *language* and *international** in the keyword search, and then restricted the search to peer-reviewed articles. This search returned 20 articles. She substituted *reading* for *language* and repeated the search. No new articles were returned. After reviewing these article titles, Natalie eliminated some based on title alone, and all the duplicates. Her review of the remaining article titles yielded six additional articles. Natalie ran the ERIC search again, but this time she deleted *international* from the keywords. Natalie found one more article on children adopted at older ages from abroad. She searched PubMed with the same terms and limited the search to title/abstracts conducted on humans that were free of charge. This searched returned nine articles, but only one relevant study. Natalie also searched the Cochrane and the IES What Works Clearinghouse sites, but found no useable articles. Her searches yielded a total of 21 articles—13 of them through her ASHA membership, 1 open access article from PubMed, and 7 from ERIC that she purchased (see Table 1).

Table 1 Key Word Search and Selected Studies

Database	Limiters	Terms	Hits	Articles Selected	Studies Selected (After title/abstract review and duplicate removal)
Eric	Title/Keywords/Peer Reviewed	adopt*, International*, language, reading	20	7	Beverly et al., 2008 Glennen & Masters, 2002 Glennen, 2002 Glennen, 2007a Glennen, 2007b Glennen, 2007c Glennen, 2009* Hough & Kaczmarek, 2011~ Hwa-Froelich & Matsuo, 2008~ Hwa-Froelich & Matsuo, 2010 Jacobs et al., 2010~ Loman et al., 2009 Pearson, 1997 Roberts & Scott, 2009* Roberts et al., 2005 Scott & Roberts, 2007 Scott et al., 2008 Scott et al., 2011 Scott, 2009* Steele & Hwa-Froelich, 2010 Tirella et al., 2006~
Cochrane	Abstract	adopt*, International*, language, reading	0	0	
Pub Med	Title/Abstract/Free Full Text	adopt*, International*, language, reading	9	1	
IES What Works Clearinghouse	Search all of IES	adopt*, International*, language, reading	0	0	
ASHA	Title/Abstract	adopt*, International*, language, reading	14	13	

~Required purchase of article.

Evaluating the Evidence

After reading the abstracts of all the articles, Natalie quickly recognized that the selected articles were not treatment studies. She could not evaluate her evidence based on procedures she used to evaluate reviews that addressed treatment questions. For questions concerning treatment decisions, quality reviews are evaluated according to criteria such as treatment fidelity, attrition, etc. Natalie's objective was to determine an appropriate assessment plan, taking into consideration the components of her PESICO question. Natalie found only one study that investigated the sensitivity and specificity of an assessment instrument on IA children, and its focus was on language development within the first year after adoption. Given the specifics of her question and the studies she found (no study was found that reviewed the sensitivity/specificity of a specific instrument on school-age, IA children), Natalie found that it was also not appropriate to use a quality review process that was directed at determining the levels of sensitivity and specificity of a particular instrument on this population (Dollaghan, 2007). She recognized that the study of language acquisition of IA children was a relatively new body of literature, and that much of the research probably would be focused on identification of important variables to be considered. Natalie needed to organize, read, and evaluate her research relatively quickly to meet the deadline date for the evaluation. Given her time constraints, Natalie decided to code her studies according to the Oxford Hierarchy (Phillips et al., 2011), and to indicate broadly the level of quality for the studies. The Oxford Hierarchy ranks the evidence for research outcomes from a low of 5 (authoritative opinions, descriptive studies, etc.) to a high of 1 (systematic review of multiple randomized-control trials).

This coding reflected a broad, yet considered, examination of the level of evidence for each study and supplied her with an index of quality. She embedded a column for Oxford coding into the table that summarized her studies and coded each study as she reviewed it. As she further reviewed the articles, she noted that several issues were consistently discussed—the age of the child at the time of adoption, age at the time of testing, country of origin, and measurements/instruments used to determine language proficiency. She added these variables to the table as well (see Table 2).

Natalie then created a snapshot of the quality of her evidence by taking the Oxford hierarchy, as it is depicted within a pyramid, and shading in the levels that were represented by her selected papers (see Figure 1). After examining this graphic presentation of the levels of evidence from the papers that she had selected, she felt certain that she had a representative sample of papers that would provide her with a balanced examination of the literature. Seven of the studies were rated at the lowest level of evidence; however, Natalie found these articles helpful in providing a firm foundation for understanding the background literature adequately, as well as the numerous issues that make assessment of the international adoption population difficult. One article was rated as a higher-quality series case study, eleven were rated as level two studies, and two studies provided the highest level of evidence in her search, one of which was a systematic review and the other was a meta-analysis. Though Natalie began her search unsure if she would be able to find high quality studies, the approach she ultimately adopted yielded evidence-based information.
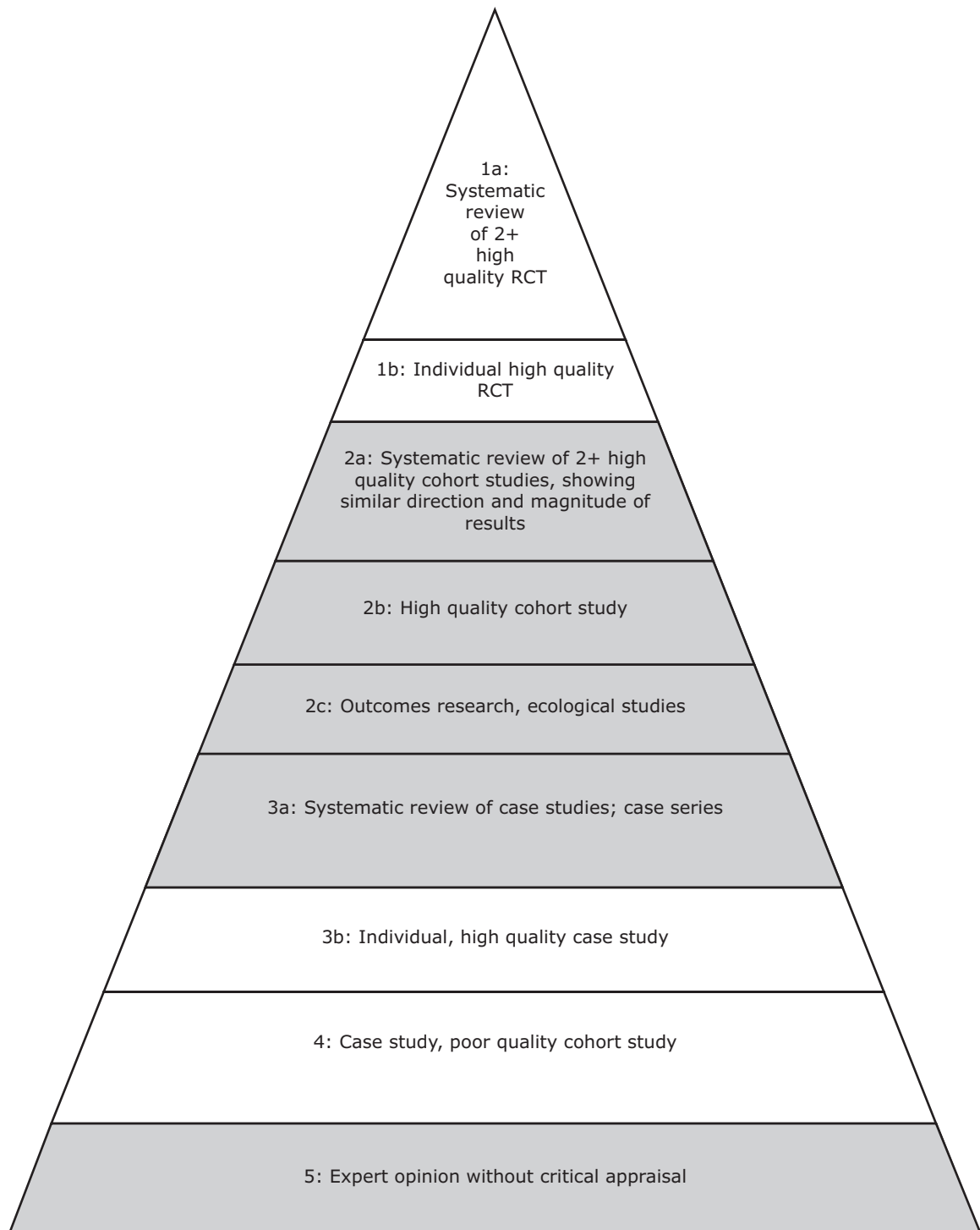
Figure 1 Quality Review Pyramid—Highest (Level 1) to Lowest (Level 5)

Adapted with permission from the Oxford Hierarchy of Evidence; Phillips, et al., 2009, 2011; Retrieved from http://www.cebm.net/index.aspx?o=1025

From the narrative-review papers, three salient factors emerged—the types of language assessment selected to measure outcomes, the effects of preadoption experiences on later language development (including age at the time of adoption), and the degree to which school-age language might be differentially affected compared with earlier language development. First, the types of assessment measures researchers used to evaluate IA children were a factor in the results of her review of the studies. Four types of assessment methods dominated the research and these types of assessment were similar to those used to assess both monolingual and bilingual children (Roberts & Scott, 2009). The four primary types of instruments included the following; published survey measures, parent-report measures, norm-referenced measures, and language and narrative samples. Though any nuanced interpretation of normative scores requires information about the psychometric properties of the respective measures, more information about the performance of adopted peers would provide the best possible information for clinical interpretation of children adopted internationally (Roberts & Scott, 2009). However, relatively few researchers have included detailed, individualized information about the performance of adopted children in comparison to one another. When provided, such information has shown subtle difficulties on a variety of measures (e.g., sentence memory) for a small subset of adopted children, but has not shown a unified set of difficulties across children (see Roberts & Scott, 2009, for a full discussion).

The types of measurements used to investigate the language outcomes of the IA children varied widely. Among the studies, numerous researchers had used norm-referenced and comprehensive oral language test batteries, extensively. Only two studies had examined reading skills—both used subtests from a well-normed reading battery. Several studies conducted with younger children used norm-referenced and other measures that were not applicable to Natalie's assessment. Other studies used researcher-developed surveys. Many of the higher quality studies had coupled norm-referenced instruments with some type of naturalistic sampling (i.e., language sampling or narrative analysis). Only one of the studies had used a control group; the other studies compared the children's outcomes to the normative data of various tests.

As Natalie read further, it became clear that using norm-referenced measures might be appropriate (particularly if comparisons could be made to other IA children on such measures), but the duration of English language exposure postadoption must be considered. For example, she found that

several papers that supported the use of norm-referenced measures at 2 years postadoption for children adopted at younger ages (Glennen, 2007b; Hwa-Froelich & Matsuoh, 2008; Jacobs et al., 2010; Loman et al., 2009; Roberts et al., 2005; Scott et al., 2008). According to Glennen, however, norm-referenced measures must be used with caution with children adopted at older ages. This recommendation was somewhat supported by the meta-analysis of Scott et al. (2011), who found that the children performed significantly lower on norm-referenced instruments than on other types of instruments. In studies with control groups, IA children performed significantly weaker on norm-referenced measures compared to control groups and normative samples. In contrast, IA children did not perform differently than non-adopted children on other types of measures. As Scott et al. (2011) concluded, their meta-analysis does not "suggest the clinical use of one type of measure over another" (p. 26), but indicates that a selection of various types of instruments should be used in the assessment process.

Combined, these findings suggest that other sources of information, such as the use of language samples and teacher rating scales, were important to include in Natalie's assessment. She particularly wanted to include a narrative assessment measure because it enabled her to evaluate many components of language (such as use of story grammar, cohesion, syntax, and lexical diversity) and she had found narrative analyses to be highly sensitive to language difficulties in children whom she had evaluated in the past. In her review, however, Natalie found little evidence for using a narrative assessment measure with IA children. Although several studies used language sampling with children at younger ages, only one study, by Scott et al. (2008), provided information on school-age narratives. They reported that children who had low scores on norm-referenced measures were more likely to produce high numbers of grammatical errors in their narrative productions. The quality of the study was good, but the number of participants was small. Roberts and Scott (2009) recommended the inclusion of naturalistic assessment practices when assessing IA children. As a result, Natalie decided to include a narrative measure, recognizing it was based on limited, high quality evidence.

The second factor that emerged from Natalie's search was a general consensus that preadoption experiences affect later language outcomes. There were differences in outcomes reported for children depending upon preadoption living arrangements, age at the time of adoption, and amount of exposure that the children had to their new language prior to

testing. For example, there was some evidence that those children who came from institutional living arrangements had poorer outcomes than those children who had lived in foster care environments (Loman et al., 2009). These researchers examined three groups of children—those adopted early (less than 12 months old) from a foster care arrangement, those adopted at older ages (more than 12 months old) from institutional living arrangements, and a group of nonadopted children. They found that the nonadopted children outperformed the children adopted early, and the children adopted early outperformed the children adopted at older ages from institutional living arrangements. This was true across several measures, including those of language and academics.

Glennen and Masters (2002) found that for children adopted from Eastern European countries, as age at adoption increased, delays also increased. Likewise, Roberts et al. (2005) found that although the majority of children were at or above expected language skills at 2 years postadoption, an older age at the time of adoption was correlated with lower scores. Scott et al. (2008) confirmed a similar relationship in young arriving children whose language skills were examined during the early school-age years. Although the relationship between age at time of adoption and school-age language was not particularly strong in the meta-analysis conducted by Scott et al. (2011), the researchers found a trend favoring better language outcomes of children adopted at younger ages. Across the studies, researchers highlighted that age at adoption was inseparable from length of exposure to the new second first language that the children were acquiring, in that at the time of adoption, children were placed in the new home language environment and the birth language was simultaneously unavailable to them.

Overall, Natalie's review revealed that preadoption experiences were significant, not only for age at the time of adoption, but also for preadoption child care environments. This was likely to be due, in part, to the combined effects of English language exposure and family care giving settings postadoption. Determining whether age at time of adoption is a significant factor due to the effects of duration of English language exposure, duration of preadoption experiences, or both, is not possible. Natalie was disappointed that both the systematic review (Scott, 2009) and the meta-analysis conducted by Scott et al. (2011) were silent on the issue of whether preadoption living arrangements impacted later language outcomes; however, she recognized at this time such data may not be available for this type of analysis. She noted that several of the articles proposed a need for research in this area. Natalie recognized that Alison's older age at the time of adoption and the preadoption years she spent in an institutional living arrangement were likely to place her at greater risk for language difficulties.

The third salient factor that emerged from Natalie's search was that there was mixed support for the hypothesis that school-age language might be more challenging for IA children when the children entered the school-age years and the language demands increased. For example, across all of the longitudinal and cross-sectional cohort studies, researchers reported that for the majority of the participants in the study, at 2 years postadoption and beyond, group means for the norm-referenced test results fell within 1.0 or 1.25 standard deviations of the mean of the normative samples, indicating that when the IA children reached the school-age years, they were able to keep pace with their nonadopted peers.

Despite these positive outcomes across the studies, interpretation about performance was tempered by findings that the standard deviations (and reported ranges) of these means in some cases was quite large, illustrating that large numbers of children were both considerably lower and higher than these averages. Further, survey studies indicated large numbers of children receiving speech and language therapy and/or placement in special education programs (Beverly et al., 2008; Tirella et al., 2006).

Though few of the studies included school-age children, those that did reported differing language outcomes, and only two articles reported findings for both spoken and written language outcomes in school-age children. Scott et al. (2008), for example, showed mean average performance on a wide array of norm-referenced tests for children in the first and second grade, with 8% of the sample more than 1.25 standard deviations below the normative means on numerous measures. In contrast, Hough and Kaczmarek (2011) reported that slightly more than 30% of their sample of school-age children who were adopted from Eastern Europe were at or below 1.25 standard deviations of the mean. Therefore, no consistent pattern of later spoken and written language outcomes was reported for school-age children.

The idea that language skill acquisition is good during the early years postadoption, but then appears to stumble as the children reach school-age, was supported in the meta-analysis by Scott et al. (2011). This article had the highest level of evidence that Natalie found in her search. Scott et al. conducted a subgroup analysis by splitting the studies into two groups. The first group comprised studies conducted when the

children were in the toddler/preschool years. The second group comprised studies in which the children were at least at school-age and older. The findings for those studies where the children were toddlers and preschoolers indicated no difference in early language acquisition between the adoptees and their non-adopted peers. There was, however, a difference between the adoptees and their non-adopted peers when language skills were examined at the school-age years and beyond. In this second group, the internationally adopted children performed more poorly than their nonadopted peers.

Although the pattern of findings across many of the studies leaned toward supporting the idea that early language skills for social communicative purposes would falter as children moved into the more demanding arena of school-age language learning, it was unclear exactly why this might be so. For example, the findings by Jacobs et al. (2010) were interesting in that although the children's language scores appeared to be strong within a few years of exposure to the new second first language, there were distinct differences in their attentional, sensory, and executive functioning skills. The researchers hypothesized that such differences may indeed impact later language and academic skills.

Finally, only four of the studies Natalie reviewed included children whose mean age at adoption was more than 2 years old at the time of their arrival in the United States. One article that pertained directly to Natalie's question was Glennen's (2007b) preliminary examination of a group of children who were adopted between ages 2 and 4 years old. The data indicated that many of the children were performing similarly to the normative samples of various language measures by 2 years postadoption, and Glennen characterized the English language accomplishments of these older children as "nothing less than incredible" (Glennen, 2007b, p. 19). However, not all children had equally impressive accomplishments, particularly for measures of expressive language. Recent findings suggest a more cautious interpretation, indicating that the child should make significant language gains by 2 years postadoption, but full proficiency may take several years (Glennen, 2009).

One article that was ranked as a level IIb article in the pyramid provided some support for Glennen's cautionary view. Hough and Kaczmarek (2011) studied children 5 to 11 years old who had been adopted at a mean age of 24 months, with a range of 7 to 81 months. They administered an extensive battery of oral language and reading measures. They reported that approximately 33% of their sample performed poorly on oral language measures. Furthermore, the researchers found a significant negative correlation between performance on norm-referenced reading measures and time spent in an institutional setting. Although in this study, all of the children who were tested had been in the United States for at least two years (and many for considerably longer), the age at time of adoption varied enormously. Furthermore, there was insufficient information provided in the article to fully understand the relationship between language performance and age at time of testing. For example, though negative correlations were reported between reading skills and time spent in institutionalized environments, it was unclear how older children with less English language exposure did relative to either younger children or to same-aged children with greater English language exposure. In summary, the studies showed a mix of results for children adopted at older ages, with some making remarkable progress, others making relatively good progress, and yet others making little progress in their language skills. Combined, the four articles provided a limited understanding as to the trajectory of the expected progress, or when to expect full language proficiency to occur. Consequently, there is a limited understanding regarding what spoken and written language difficulties may arise at later ages for older-arriving children.

Making an Evidence-Based Decision

By this point, Natalie had conducted several major steps. She had posed her PESICO question and conducted her search for the available evidence. Although she found no article that directly related to her question, she found several that would assist her in the process of making an evidence-based decision. She had read and evaluated the external evidence. However, Natalie had not fully evaluated the research with respect to the stakeholders involved (i.e., student, teacher, parents). She also had not yet fully evaluated the internal clinical and client evidence, so she turned next to those aspects of her decision.

In reviewing her own clinical practice decisions regarding assessment, Natalie recognized that when she conducted diagnostic evaluations to identify language impairments, she was careful to select instruments that

reported good levels of sensitivity and specificity. She frequently incorporated various types of naturalistic language samples (such as conversational samples and narratives) because she could obtain richer information than what she could obtain through norm-referenced testing alone. Given this and the ways language was measured across the selected studies, Natalie saw no specific conflicts between her current practice and the measures reported in the studies she had reviewed. The researchers' recommendations mirrored her current practice of conducting assessments to determine if a child had a language impairment.

Natalie examined the measures used in her selected studies and found several of the norm-referenced and criterion-referenced instruments were age appropriate for her assessment. So, the next question Natalie needed to answer was, would administering any of these specific measures influence the identification of a language disorder and possible treatment decisions? Because the referral was not concerned with articulation skills, Natalie immediately ruled out using any norm-referenced measure of articulation. Given the time constraints of the evaluation, she decided that a broad-based language assessment instrument was more appropriate for her diagnostic plan, and that she would not have sufficient time to include additional measures of vocabulary. Natalie noted that the *Clinical Evaluation of Language Fundamentals–fourth edition* (CELF–4, Semel, Wiig, & Secord, 2005) was used in several of the studies and she was comfortable with its reported psychometric qualities. Given the reported academic concerns, Natalie needed to include measures of written language. Again, she reviewed the articles for the measures used to establish language outcomes in this group of children. She knew that the *Woodcock Johnson Diagnostic Reading Battery, third edition* (WJDRB-III; Woodcock, 2004) and the *Comprehensive Test of Phonological Processing* (CTOPP; Wagner, Torgesen, & Rashotte, 1999) reported adequate evidence of validity and good reliability. Using the CTOPP would also provide a nonword repetition measure, which Steele & Hwa-Froelich (2010) suggested as important to include in the assessment of IA children. Based on the purpose of the evaluation, the parents' and teacher's reported concerns, and the evidence Natalie's search uncovered, she chose those three instruments and a narrative task to use in her assessment. Although the evidence did not directly support the use of a teacher observation scale, Natalie decided to include one because she had found teacher's observations helpful in understanding a student's performance in the classroom. Natalie thought the teacher's classroom observations might provide insight to Alison's attentional, sensory, and executive functioning skills as well.

Natalie noted that both the parents and the classroom teacher were concerned with Alison's lack of continued growth in the spoken and written language skills she had demonstrated in the second grade. Because Natalie's clinical judgment had been enlightened by her search, she recognized that several preadoption and postadoption issues were important to consider in her evaluation. Among articles of both low and high levels of evidence, there appeared to be some converging thought that, although many IA children would not experience language problems, some do. If Alison performed poorly on measures within her battery, it was likely that such performance would indicate a need for treatment, rather than the residual effects of catch-up in English language learning acquisition. Natalie had found enough evidence to justify an assessment to rule out a specific language impairment and to create an assessment plan that included broad-based, norm-referenced measures of language and reading, a narrative assessment, and parent/teacher reports.

The three components of evidence-based research are typically depicted in a triangle, with each tip of the triangle representing one of three components; clinical expertise, current best research evidence, and client/patient perspectives. In most depictions, the apex or top tip of the triangle represents best research evidence. This may lead one to believe that research evidence is the most important aspect to consider in the process. However, perhaps a more useful depiction is one in which the components of evidence-based research are shown with the components aligned along the sides of the triangle rather than the tips. Such a depiction would illustrate that not a single component of the triangle should be favored, but each component should be considered as the practitioner synthesizes the three aspects of evidence-based practice. The question that Natalie posed concerned an area of practice in which the literature is relatively new. Moreover, the literature specific to her question regarding children who are adopted at older ages was particularly lacking. Nonetheless, after a reasoned, systematic approach to evaluating the existing research, Natalie was confident in her evidence-based assessment decisions.

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Table 2 Selected Studies and Language Outcomes

Reported Study	Design	Country	Mean Age at Testing (unless otherwise specified)	Mean Age at Adoption (unless otherwise specified)	Sample Size Adopt/Control	Language Measure	Quality Rating	Finding: As it relates to PESICO
Beverly et al., 2008	Survey	Eastern Europe	10.95 yrs.	42 mos.	55/none	Researcher developed survey	IIc	High rate of speech/language problems and high rate of special education labels by school-age.
Glennen & Masters, 2002	Longitudinal; Cohort Study	Eastern Europe	6–40 mos.	Infant–30 mos.	130/Norms	LDS; MCDI; Rosetti Infant-Toddler Scale (modified)	IIb	Language developed similar to nonadopted children; delays noted through 36 months of age PA; delays increased as age at adoption increased.
Glennen, 2002	Narrative Review	n/a	n/a	n/a	n/a	n/a	V	Preadoption experiences are important to consider when assessing IA children.
Glennen, 2007a	Prospective; Longitudinal; Cohort Study	Eastern Europe	Time 1 = 18.7 mos.; Time 2 = 31.26 mos.	16 mos.	23/Norms	CSBS-DP; GFTA2; MCDI; PLS–3 & 4; language sample	IIb	Initial assessment using the CSBS–DP and MCDI–WG provides guide for early intervention services. Children with delays in prelinguistic skills and vocabulary comprehension were more likely to have language difficulties later.
Glennen, 2007b	Narrative Review	Eastern Europe	n/a	n/a	n/a	n/a	V	Describes risk factors associated with older arrivers and difficulties of assessment; briefly describes performance on standardized tests for a group of older arrivers.

Study	Design	Origin	Age	Age at test	N/Norms	Measures	Level	Findings
Glennen, 2007c	Narrative Review	n/a	n/a	n/a	n/a	n/a	V	Preadoption experiences are important to consider; loss of L1 may impact academic learning; assessment of L1 upon arrival may be informative; preliminary data indicates rapid early language gains should be seen.
Glennen, 2009	Longitudinal; Cohort and Case Series	Eastern Europe	Time 1 = 3 mos. PA; Time 2 = 9 mos. PA; Time 3 = 14 mos. PA	2:1–2:11 yrs. 3:4–4:9 yrs.	15/ Norms and local norms	CELF–P2; GFTA2; MCDI; PPVT4; PLS–4; MLU	IIb	Mean scores within 1 SD of test after 1 year home for both younger and older adoptees; expressive language lags seen compared to articulation and receptive language. Great variability seen in expressive language in particular.
Hough & Kaczmarek, 2011	Cross-sectional; Cohort study	Eastern Europe	5;10–11;8 yrs	7–81 mos.	44/ Norms	CASL; CCC; Leiter; TOLD3; WRMT-R/ NU; MLU	IIb	All mean oral language test scores and reading test scores within 1 SD of mean, but high numbers of children below average on various subtests compared to normative data. Oral and written language skills were negatively correlated with length of time in orphanage.
Hwa-Froelich & Matsuo, 2008	Longitudinal; Cohort Study	China, Eastern Europe	Time 1 = 16.9 mos. Time 2 = 26.8 mos.	8–20 mos.	14/Norms	CSBS-DP; MCDI; PLS–4;	IIb	With outliers removed, no differences observed between Eastern European and Chinese cohorts; by 2 years PA most children in average range compared to normative data.

Study	Design	Country	Age at testing	Age at adoption	N	Measures	Level of evidence	Findings
Hwa-Froelich & Matsuo, 2010	Longitudinal; Case series	China	1 yr; 2–3 yrs.	12 mos.	4/Norms	CELF P–2; CSBS-DP; MCDI; Westby Play Scale	IIIb	Much variability in language development observed during the first 2–3 years PA.
Jacobs et al., 2010	Longitudinal; Cohort Study	Varied	54.1 mos.	12.2 mos.	37/Norms	Mullen Scales; PLS–4	IIb	Mean language scores over 1SD above mean; early Mullen expressive scores predictive of PLS–Expressive; high rates of difficulties with executive functioning and sensory skills; Language delays increased as age at adoption increased.
Loman et al., 2009	Cross-sectional; Cohort study	Varied	10.1–10.4 yrs.	PI group 24.0 mos.	PI = 91; EI/FC = 109 Control = 69	CASL; CELF–4	IIb	Mean scores in average range for all groups but PI lower than foster care or controls. As age at adoption increased likelihood of weaker later language outcomes increased.
Pearson, 1997	Narrative Review	n/a	n/a	n/a	n/a	Varied	V	Discussed issues of adopting older children; contrasted two 11-year-olds, one made good progress and the other did not.
Roberts & Scott, 2009	Narrative Review	n/a	n/a	n/a	n/a	Varied	V	Within 2 years PA use of criterion-referenced instruments and parent/teacher survey recommended; 2+ years PA judicious use of norm-referenced measures coupled with criterion-referenced instruments and naturalistic language sampling recommended.

Study	Design	Origin	Age	Age at adoption	N/Comparison	Measures	Level	Outcomes
Roberts et al., 2005	Cross-sectional; Cohort study	China	52.9 mos.	13.5 mos.	55/Norms	CELF–P; EOWPVT–R; GFTA2; PPVT-III	IIb	Majority of children were at or above expected language skills when compared to normative sample at 2+ years PA.
Scott & Roberts, 2007	Narrative Review	n/a	n/a	n/a	n/a	Varied	V	Some children performed more poorly at school-age than at younger ages; no watchful waiting recommended by school-age; age at time of adoption inconclusive.
Scott et al., 2008	Cross-sectional; Cohort study	China	7– 8 yrs.	6–24 mos.	24/Norms	CELF–4; CTOPP; WJDRB; WRAT3; Narrative	IIb	Good language outcomes compared to norms; age at adoption predictor of outcomes.
Scott et al., 2011	Systematic review and meta-analyses	Varied	Toddler–Adult	3 mos. and older	Varied	Varied	IIa	Good language outcomes for toddler/preschool ages; weaker language outcomes for school-age; age at adoption indicates slight trend favoring younger adoptees.
Scott, 2009	Systematic review of school-age outcomes	Varied	School-age–Adult	Varied	Varied	Varied	IIa	Reported positive and negative long-term language skill outcomes when IA children reach the school-age years. This paper lists all language measures used across studies.

Steele & Hwa-Froelich, 2010	Narrative Review	n/a	n/a	n/a	Nonword repetition tasks	V	Describes nonword repetition in children with LI; then reports that 60 adopted children scored within 1 SD of mean and concludes that nonword repetition measures can be given to rule out LI in adopted children.
Tirella et al., 2006	Survey	Eastern Europe	8–12 yrs.	1–8 yrs.	81/none	Researcher developed survey	IIc	High percentages of children reported to have language difficulties or learning disabilities and high percentages received speech-language therapy and special education services.

Table 2 Abbreviations:

CASL = Comprehensive Assessment of Spoken Language
CCC = Children's Communicative Checklist
CELF–P = Clinical Evaluation of Language Fundamentals–Preschool
CELF–4 = Clinical Evaluation of Language Fundamentals–Fourth Edition
CELF P–2 = Clinical Evaluation of Language Fundamentals Preschool–Second Edition
CSBS-DP = Communication and Symbolic Behavior Scales-Developmental Profile
CTOPP = Comprehensive Test of Phonological Processing
EA/FC = Early Adopt/Foster Care
EOWPVT-R = Expressive One Word Picture Vocabulary Test-Revised
GFTA2 = Goldman Fristoe Test of Articulation-2
LDS = Language Development Scale

MCDI = MacArthur-Bates Communication Development Inventory
MLU = Mean Length of Utterance
Norms = Tests' normative data (sample)
PA = Postadoption
PI = Post-institutional
PLS–3/4 = Preschool Language Scale—Third and Fourth Edition(s)
PPVT-3/4 = Peabody Picture Vocabulary Test, third edition/fourth edition
TOLD3 = Test of Language Development, third edition
WJDRB = Woodcock Johnson Diagnostic Reading Battery
WRAT3 = Word Reading Achievement Test–3
WRMT-R/NU = Woodcock Reading Mastery Test–Revised/Normative Update