

# Input and Language Development in Bilingually Developing Children

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## ABSTRACT

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Language skills in young bilingual children are highly varied as a result of the variability in their language experiences, making it difficult for speech-language pathologists to differentiate language disorder from language difference in bilingual children. Understanding the sources of variability in bilingual contexts and the resulting variability in children's skills will help improve language assessment practices by speech-language pathologists. In this article, we review literature on bilingual first language development for children under 5 years of age. We describe the rate of development in single and total language growth, we describe effects of quantity of input and quality of input on growth, and we describe effects of family composition on language input and language growth in bilingual children. We provide recommendations for language assessment of young bilingual children and consider implications for optimizing children's dual language development.

**KEYWORDS:** Bilingual, language, assessment, input

**Learning Outcomes:** As a result of this activity, the reader will be able to (1) describe sources of variability related to input in the bilingual language learning context, and (2) explain the clinical implications of current evidence.

The language skills of children who speak two languages are highly varied and present unique challenges to speech-language pathologists. Speech-language pathologists face the

difficult task of differentiating typically developing dual language-learning children from dual language-learning children with language disorders. An understanding of the range of

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developmental profiles of typically developing bilingual children is central to meeting this challenge so that appropriate peer-based comparisons can be made in identifying bilingual children with language impairment. One key to understanding the skills of children from dual language backgrounds and to optimizing their language development is to understand the varied nature of the language input to bilingual children and its influence on language outcomes. It is well established in the literature on monolingual development that children's language skills reflect the quantity and quality of their language experience. This is no less true of bilingual children. In this article, we review the literature on the relation of early dual language exposure to bilingual development to provide practitioners with background to inform the approaches they might take in assessing and serving bilingual children and their families.

Nearly a quarter of the children in the United States hear a language other than English at home, and this number is projected to grow as a result of continued immigration and births to immigrant parents.<sup>1-3</sup> In some school districts and clinical practices, children from homes that use a language other than English are the majority. Occupational success for these children depends on their verbal and related literacy skills—more so than for past generations of immigrants and their children. The combination of the large and growing number of children experiencing dual language input and the importance of their developing strong language skills creates an urgent need for practitioners to understand the consequences of dual language input for language development.

We focus our literature review on language development before age 5, on children who hear two languages from birth, and on children in the United States. We focus on the first 5 years because a substantial literature argues that for both monolingual and bilingual children, the oral language skills that children acquire in the first 5 years of life are strong predictors of subsequent academic outcomes.<sup>4-7</sup> We focus on children exposed to two languages from birth because we take it as unsurprising that English skill levels will be low in 4- and 5-year-old children who hear only a heritage language

at home and whose first systematic exposure to English begins with preschool or kindergarten. It is less obvious what one should expect from children who have heard two languages from birth. We focus on children in the United States because the factors that shape input and language development in this circumstance differ from the factors that operate elsewhere. In the United States, the vast majority of children who hear a language other than English at home are children with one or two foreign-born parents.<sup>8</sup> In other places, bilingualism is less of an immigrant phenomenon and more a stable feature of the community. Welsh–English bilingualism in parts of Wales and French–English bilingualism in parts of Canada are just two examples of stable bilingualism.<sup>9</sup>

Scientific and lay opinions regarding the outcome of dual language exposure have changed over the years. In the early part of the 20th century, arguing from methodologically inadequate research on immigrant children, scholars suggested that dual language exposure was detrimental—that it caused confusion and impaired children's ability to learn either language. Subsequent research revealed the error of that conclusion, and that view is no longer taken seriously among researchers.<sup>10</sup> In a more recent era, scholars influenced by the Chomskyan theoretical approach that language acquisition reflects the maturation of an internally specified grammar have made the opposite argument. Scholars have claimed that children exposed to two languages acquire each language at the same rate that children in monolingual environments acquire one language (e.g., Gleitman and Newport,<sup>11</sup> Petitto et al<sup>12</sup>). Although the prevalence of this view appears to be declining, expressions can be found currently in the scientific literature (e.g., Kovács and Mehler<sup>13</sup>) and on Web sites aimed at parents raising bilingual children (e.g., King and Fogle<sup>14</sup>).

There is only a weak empirical basis for this widely made claim that bilingualism has no cost in terms of the rate of single language development. It consists of findings from small-sample studies designed to ask theory-based questions about the human capacity to acquire two languages, not studies aimed at providing normative data on the rates of monolingual and bilingual development.

Two widely cited studies found that bilingual children are within monolingual norms for the age at which they achieve basic milestones of language development and in the acquisition of some aspects of grammar.<sup>12,15</sup> One also widely cited study found no statistically significant difference in vocabulary growth between monolingual and bilingual children.<sup>16</sup> As practitioners know, however, the range of normal individual differences in language development is large. That variability makes it possible for bilinguals to lag behind monolinguals but still to fall within the normal range of variation and makes it difficult for even substantial differences to reach statistical significance when sample sizes are small.<sup>17,18</sup>

Research on early bilingual development has grown rapidly in recent years. The results of this new body of research suggest a middle ground position between the opposing views that dual language input is harmful and that dual language input results in bilingual development that proceeds at the same pace as monolingual development. The findings of the past decade of research provide evidence that although children most certainly have the ability to process dual language input and learn two languages, learning two languages takes longer than learning one—even for children. The research also makes clear that variation in the quantity and quality of input in each language affects the rate at which each language is learned. Finally, the research suggests that high-quality input is more likely to be provided by adults whose own level of language proficiency is high. All of these findings have implications for clinical practice with children from dual language environments. We review that evidence and discuss its implications below.

### CONSEQUENCES OF DUAL LANGUAGE INPUT FOR THE RATE OF LANGUAGE DEVELOPMENT

Children who hear and acquire two languages build linguistic knowledge at a rate comparable to or greater than is observed in children who hear and acquire only one language. But the language growth of bilingual children, like their language input, is divided between two languages. The result is that young bilingual children tend to lag behind monolingual

children of the same age in vocabulary and grammatical development when measured in each language separately. Multiple studies provide the evidence for these conclusions. Evidence of comparable rates of total language knowledge growth comes primarily from studies of vocabulary development, where it is relatively straightforward to estimate total language knowledge by summing vocabulary size estimates in children's two languages.<sup>19–22</sup>

One study also created a combined measure of grammatical knowledge and found skill levels comparable to those of monolingual children.<sup>23</sup> Evidence of a lag in single language development comes from many studies of both vocabulary and grammatical development.<sup>9,18,19,24–27</sup>

Some evidence suggests that in grammatical development, bilingual children catch up to monolingual children in single language skills by the age of 9 or 10.<sup>9</sup> The bilingual–monolingual difference in vocabulary size may be lifelong, because vocabulary development does not have a point at which it is complete.<sup>9,18,28</sup> One last point to make about the differences in single language skills between monolingual and bilingual children is that they are observed even when there are not differences in socioeconomic status (SES).<sup>19,29</sup> Homes in which a language other than English is spoken are, on average, characterized by lower levels of parental education and income than monolingual homes, but there are differences associated with dual language exposure that are not confounded by SES.

These features of bilingual development, comparable total language growth, and lags in single language growth are illustrated in a recent study of English monolingual and Spanish–English bilingually developing children in South Florida.<sup>19</sup> Because the Spanish-speaking immigrant population of South Florida includes large numbers of highly educated professionals, the monolingual and bilingual children came from households of equivalent SES. We studied the language development of 56 monolingual and 47 bilingual children from the age of 22 months to 30 months, using the MacArthur–Bates inventories to assess vocabulary and grammar, in English (MacArthur–Bates Communicative Development Inventory [CDI]<sup>30</sup>) for all children and also in Spanish (Inventario del Desarrollo de Habilidades

Comunicativas [IDHC]<sup>31</sup>) for the bilingual children. We found that the monolingual English-speaking children had larger English vocabularies and were more advanced on the measures of utterance length and grammatical complexity in English than were the bilingual children. When the bilingual children's vocabulary scores in English and Spanish were combined into a total vocabulary (TV) score, however, there was no difference between the monolingual and bilingual children. These data are presented in Fig. 1.

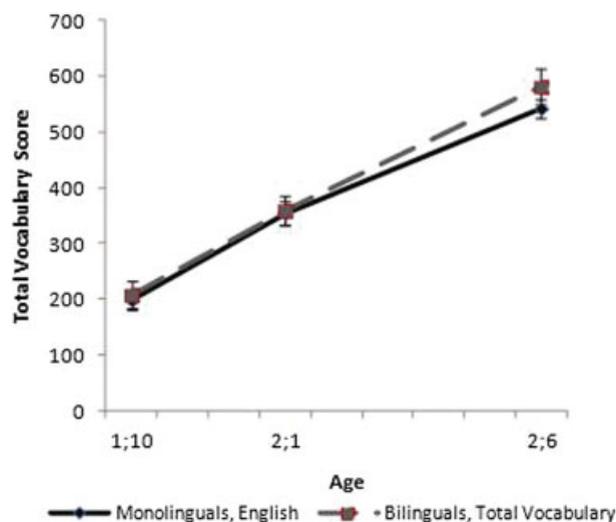
We followed 31 of the monolingual and 26 of the bilingually developing children at 4 years of age and found that, on average, the children from dual language homes scored at age level on measures of productive English vocabulary based on monolingual norms. However, their vocabulary scores were significantly lower than their SES-equivalent monolingual children.<sup>32</sup> Those data are presented in Fig. 2.

### EFFECTS OF THE QUANTITY OF LANGUAGE INPUT ON LANGUAGE DEVELOPMENT IN BILINGUAL CHILDREN

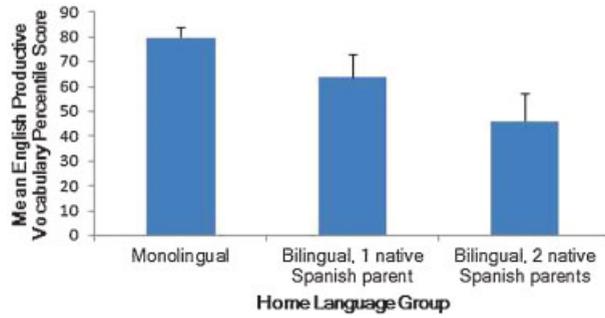
Most children exposed to two languages hear one of those languages more than they hear the other. This feature of dual language input

creates a common feature of bilingual children's language skills—that they are more advanced in one language than the other.<sup>19,21,33</sup> Findings from the study of Spanish–English bilingually developing children followed from 22 to 30 months illustrate this effect. The children whose homes were English dominant were stronger in their English skills, the children whose homes were Spanish dominant were stronger in their Spanish skills, and the children who experienced relatively balanced input were relatively balanced in their language skills.<sup>19</sup> Those findings are presented in Fig. 3 for two measures, vocabulary and the onset of combinatorial speech. The same pattern of findings were obtained for the other measures of grammatical development on the CDI and IDHC.<sup>19</sup> Another feature of bilingual children's vocabulary knowledge is its distributed nature.<sup>34,35</sup> Because bilingual children may experience each language in different contexts, they may know different vocabulary in each language. For example, children may know words for school-related items in English and for home-related items in their heritage language.

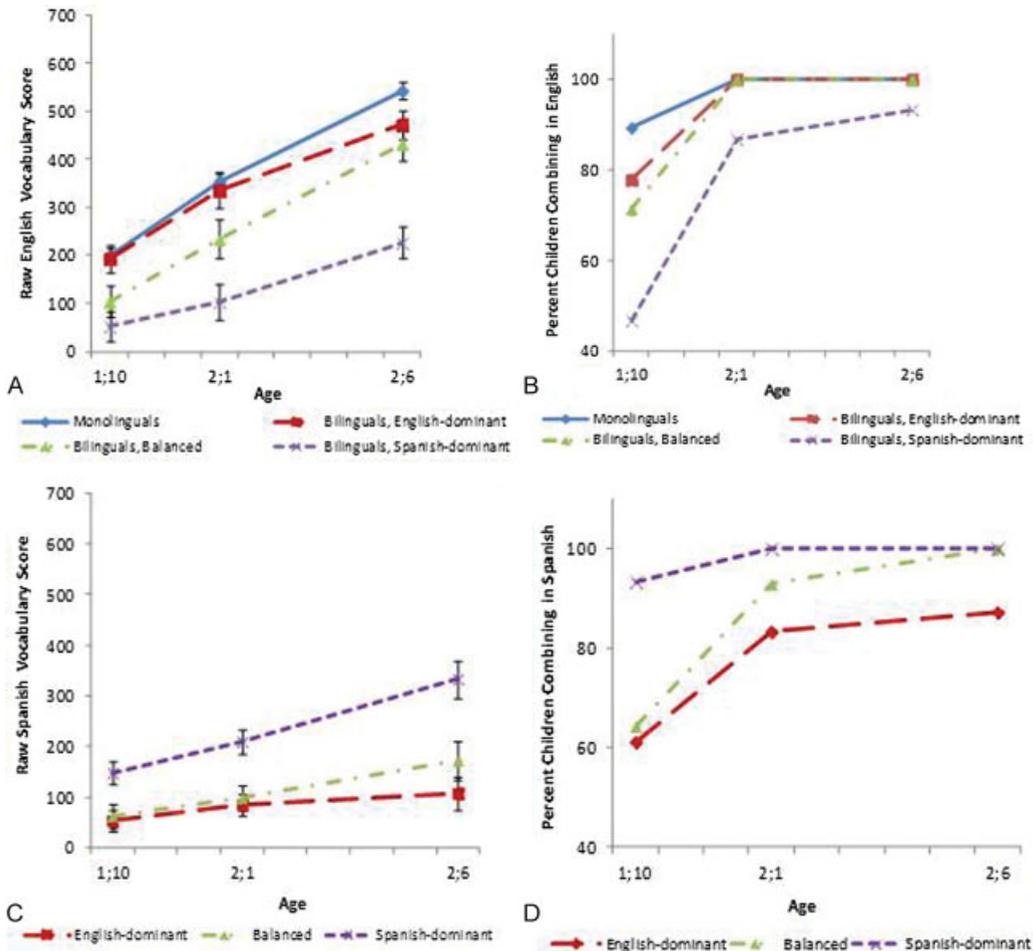
One topic of interest in the study of input effects on bilingual development is whether there are threshold effects. A minimum threshold has been suggested, such that children will not acquire a language if it represents less than



**Figure 1** Total raw vocabulary scores (English + Spanish) for bilingually developing children and English raw vocabulary scores for monolingual children at 22, 25, and 30 months.



**Figure 2** Productive English vocabulary percentile scores at 4 years for children from English monolingual homes, children from Spanish–English bilingual homes with one native Spanish and one native English speaking parent, and children from Spanish–English bilingual homes with two native Spanish speaking parents.



**Figure 3** (A and B) English vocabulary scores and percent of children combining words in English for monolingual children, and for bilingual children with English-dominant, balanced, and Spanish-dominant input. (C and D) Spanish vocabulary scores and percent of children combining words in Spanish for bilingual children with English-dominant, balanced, and Spanish-dominant input—at 22, 25, and 30 months.

20% of their input. The evidence for this belief is inconclusive. At the age of 2 years, even children who hear only 20% of their input in Spanish have learned some Spanish.<sup>19,27</sup> However, this skill gap between languages may not be sustainable. Children may ultimately stop using and thus stop learning a language in which they have low skill levels.<sup>21,36</sup> An upper threshold has also been suggested, such that children who have 60 or 80% of their input in one of their languages develop that language no differently from monolingual children. In the data on early productive language development, there is no evidence of this sort of threshold. Although the size of the difference between monolinguals and bilinguals is smaller and not always statistically significant when bilinguals are assessed in their dominant language (which constituted 70% or more of their input), some significant differences are still observed.<sup>19</sup> The relation of input to the development of receptive language skills may be different, however. There is some evidence that developing the ability to understand a language does not require as much input as developing the ability to speak a language.<sup>37-39</sup>

### **EFFECTS OF FAMILY COMPOSITION ON CHILDREN'S DUAL LANGUAGE INPUT AND BILINGUAL DEVELOPMENT**

The balance of heritage language and English use in bilingual homes varies as a function of who lives in the household and the age of the child. When both parents are native heritage language speakers, heritage language use is greater than when only one is.<sup>27</sup> When the children in the household include children who go to English language schools, English use is greater than in households with only preschoolers.<sup>33</sup> As children move from infancy to school age, parents increase their use of English.<sup>32</sup> There are multiple possible reasons for this, including the parents' deliberate use of more English because they believe they should do this to prepare the children for school and also because their own English skills may be growing with more time since immigration. Also, as children get older, home language use accounts for a decreasing portion of their total language input.

For all these reasons, many children exposed to English and a heritage language from infancy often become increasingly dominant in English as they get older,<sup>9,40,41</sup> and not all children who begin language development acquiring two languages ultimately become bilingual.<sup>42</sup> One factor that appears to predict which young bilingually developing children will continue to develop as bilinguals is whether one or both parents speak the heritage language. When both parents are minority language speakers, the children are more likely to sustain bilingual development than when only one is.<sup>32,42,43</sup> Some studies also find that parents are more likely to use the minority language with daughters than with sons and that girls are more likely to develop as bilinguals than boys.<sup>44,45</sup>

### **EFFECTS OF THE QUALITY OF LANGUAGE INPUT ON LANGUAGE DEVELOPMENT IN BILINGUAL CHILDREN**

All input is not equal; some input is more supportive of language development than other input. Studies of input and monolingual development have identified several properties of child-directed speech that are positive predictors of children's language development, including use of a diverse vocabulary, diverse syntactic structures, and decontextualized language use.<sup>46-48</sup> There is every reason to think that these relations would also be observed in bilingual development, although few studies have measured quality of input in bilingual environments (but see Grüter and Paradis<sup>49</sup>). Two findings from studies of children in bilingual environments do echo similar findings from studies of monolingual children: Language exposure in the context of book reading is particularly supportive of development in that language,<sup>50,51</sup> and language exposure via television is not particularly supportive.<sup>50</sup>

Research on the relation of properties of input to bilingual development has more frequently examined properties of input that are particularly likely to be sources of variance for children in bilingual environments. In addition to balance in the relative amount of input, these properties include how separate the two

languages are in experience, how many different people the children have as sources of input in each language, and how much of their input in each language children hear from native speakers.

Evidence suggests that hearing a language from several different speakers is more supportive of language development than the same number of hours of language exposure from fewer speakers.<sup>27</sup> This finding is consistent with other evidence that illustrates the variability and diversity of the language—at the phonological, lexical, and syntactic levels—is supportive of language development.<sup>52,53</sup> Input from multiple people is likely to be more diverse than input from fewer people.

The question of whether the degree to which two languages are mixed or intermingled in bilingual children's experience influences bilingual development is not settled. Studies of infant speech perception make it clear that children exposed to two languages can tell them apart, even if they come from the same speaker, and that young bilingual children distinguish between their two languages in their own use. However, even if children are not confused by language mixing, it is possible that input that contains language mixing is not as useful a database for language acquisition as input in which two languages are clearly separated.<sup>54</sup> That argument is supported by one finding that parents' intrasentential language mixing (using words from both languages within the same sentence) was negatively related to children's comprehension vocabularies at the age of 1 and a half years.<sup>54</sup> Other studies have found no relation of language development to either intersentential language mixing or to measures of how frequently children experienced their two languages in the same context or in the same 30-minute time block.<sup>27</sup> It is possible that language separation is not necessary for children to learn two languages, but that when language mixing occurs within individual sentences, some of the cues that children use in word learning might be obscured. It is important to point out that language mixing serves a variety of sociolinguistic and pragmatic functions in bilingual interactions, and, at this point, there is no evidence that would warrant discouraging parents from the practice.

### **ADULTS' LANGUAGE PROFICIENCY IS RELATED TO THE BENEFIT OF THEIR INPUT FOR LANGUAGE DEVELOPMENT**

A final source of variability that is particularly relevant for children in bilingual environments is whether the language they hear is the native or second language of the people who talk to them. Several findings suggest that when parents are not native speakers of the language they use with their children, the language exposure they provide may be less supportive of language development than the language exposure provided by native speakers who, on average, are more proficient speakers. One study of children from Spanish-speaking homes found that the children whose parents spoke more English to them did not have stronger English skills, although they did have weaker Spanish skills.<sup>55</sup> Another study of 2-year-olds in Spanish-English bilingual homes found that the proportion of the children's English that came from native speakers was a positive predictor of the children's English skills, over and above effects of how much English the children heard,<sup>27</sup> and that finding has been replicated in a separate sample of 30-month-olds.<sup>54</sup> A follow-up of those 2-year-old bilingual children at the age of 4 years found that English use at home was a strong predictor of these children's English skills only if one of their parents was a native English speaker; English use at home was a weak and not statistically significant predictor of the English language skills of children with two foreign-born parents.<sup>38</sup>

The distinction between native and non-native speakers as sources of input is probably not categorical but rather reflects graded effects of language proficiency. A study of immigrant children in Canada found that the amount of English the children heard at home was a positive predictor of their English language development only among children whose parents had a fairly high degree of English language proficiency.<sup>56</sup> Other studies have found that the English proficiency of immigrant mothers predicts their children's English vocabulary both as children<sup>57</sup> and as adults.<sup>36</sup>

## IMPLICATIONS FOR THE ASSESSMENT OF CHILDREN FROM DUAL LANGUAGE ENVIRONMENTS

The heterogeneity in language experience among young bilingual children results in a range of language abilities that reflect the properties of the input that bilingual children hear. This wide range of abilities in each of a bilingual child's languages makes it virtually impossible to identify a single reference group for standardized testing of bilingual children. Yet, standardized tests are generally required for establishing eligibility for services that receive public funding, presenting a challenge for speech-language pathologists to provide objective evidence of language disability and to differentiate language disability from language difference in young bilingual children. Further, it is well established that using monolingual norms to assess one of a bilingual child's languages offers a limited view of language development, and that this practice results in an underestimate of bilingual children's overall language knowledge, and over-identifies children at risk for continuing language.<sup>23,58,59</sup>

One approach to bilingual assessment is to test bilingual children in their dominant language and compare them to monolingual norms. This approach may help speech-language pathologists rule out a language impairment when bilingual children score in the normal range for monolingual development. When bilingual children score below monolingual norms, however, inferring a language impairment is not warranted. Even when a child has a relatively dominant language, results from standardized testing using tests designed for and normed on monolingual children will underestimate a bilingual child's abilities.<sup>19</sup>

One common recommendation to speech-language pathologists is to test in both of a child's languages and to consider children's skill levels in both languages in light of the balance of the two languages in children's experience.<sup>61</sup> However, that recommendation may be difficult to implement. There is no accepted method for considering abilities in each language as part of a whole set of language skills for a child,<sup>23</sup>

and dominance may be difficult to determine for children whose language environment has varied during their lives.

One last recommendation is for assessments to be conducted in both languages at different points in time, on the logic that lack of growth would be an indicator of impairment. However, work in progress in our laboratory indicates that close to 50% of the children in our high-SES sample of bilingual toddlers had persisting low scores from 22 to 30 months (below the 16th percentile, i.e., one standard deviation below the mean) in both of their two languages. Relatedly, a recent study of 163 dual language-learning children from predominantly Spanish-speaking homes found that a majority of the children (63%) had standardized test scores that indicated low proficiency in both of their languages at kindergarten entry.<sup>62</sup> Follow-up data indicated that after 2 years of English language education, the majority of the children (64%) were performing in the proficient range in one of their two languages. Together, the data from these two samples suggest that assessment at multiple early time points will not solve the problem of identifying language impairment among children exposed to two languages if scores in each language are interpreted relative to monolingual norms.

A better approach for children 30 months and younger, we argue, is to measure TV.<sup>63</sup> The TV measure is the sum of the raw scores from MacArthur-Bates inventories in two languages, which is compared with the norms reported for monolingual English-speaking children. As Fig. 1 shows, TV size for the bilingual children was not different in size or rate of change from the mean English vocabulary in the monolingual children at all three time points.<sup>19</sup> Further, TV identified the same proportion of bilingual children below the 25th percentile and above the 75th percentile on the CDI using English norms as monolingual children in an SES-equivalent control group at 22, 25, and 30 months.<sup>63</sup> The data also suggested that for assessing language learning abilities, TV measures are preferable to conceptual vocabulary measures, which count all the words a child produces in both languages, then subtract the overlapping concepts or translation

equivalents if the purpose is to assess a child's language learning ability. When conceptual vocabulary scores were calculated for these same children and compared with monolingual norms, a greater proportion of bilingual than monolingual children scored below the 25th percentile.<sup>63</sup>

Vocabulary development is easy for both parents and professionals to monitor over time. TV allows clinicians to monitor overall vocabulary growth during this period of rapid learning. Because the measure counts words produced in both languages, growth in vocabulary is able to account for words that are unique to each language as well as words that are translation equivalents across languages, and relationships between a child's two languages can be monitored over time.

Although a TV measure offers some promise for assessing language development in bilingual first language learners under the age of 3 years, it is not sufficient alone. Impressions from teachers, speech-language pathologists, and parents can make important contributions to clinical decision making, particularly when standardized testing provides inconclusive results. Proposed models of risk factors developed for monolingual children suggest that clinical diagnosis should also be informed by including parent and clinician impression, family history of language impairment, delays in comprehension, and use of communicative gestures.<sup>64,65</sup>

Finally, clinicians should be careful drawing conclusions about the influence of the home language environment or the parents' native languages on a child's abilities. As children approach school age their input in English tends to increase, and this leads to an increase in English abilities, but not necessarily in Spanish abilities. Clinicians cannot assume that a child who is exposed to both languages from birth will become bilingual, nor can they assume that a child whose parents speak Spanish at home have better Spanish than English abilities. A child's overall language experience is very likely to increase in English as the child gets older, and a child's abilities in both languages will reflect that change in stronger English and relatively weaker Spanish abilities over time.

## IMPLICATIONS FOR OPTIMIZING THE LANGUAGE DEVELOPMENT OF CHILDREN FROM DUAL LANGUAGE ENVIRONMENTS

It is clear that the human brain can handle dual language input and that children can learn two languages provided sufficient input of sufficient quality. Providing children access to the input that they need can be difficult, however. The challenge is twofold: it can be difficult to sustain heritage language use in the face of the dominance of English in the larger community, and it can be difficult to provide sufficient English language input when both parents are native speakers of the heritage language. Broadscale programs will require public policy initiatives. Individual teachers, early care providers, speech-language pathologists, and pediatricians can also have effects on individual households and children because they are in a position to advise parents. The implications of research on the relation of input to bilingual development are that two widely circulated (and contradictory) pieces of advice are *wrong*:

1. Children do *not* acquire two languages at the same pace as they acquire one. Although the belief that children can acquire both languages equally and at the same rate is often well intentioned and meant to counter the mistaken view that children are confused and damaged by dual language input, it is no favor to parents of bilingual children to lead them to expect that their children will acquire each language at the exact same pace as monolingual age mates. Parents should be told and teachers and clinicians should expect that it will likely take longer for bilingual children to acquire each language, and this is perfectly normal.
2. Parents do *not* necessarily benefit their children by avoiding use of the heritage language and speaking only English. They may be diminishing their children's opportunities to acquire the heritage language without comparable benefit to the acquisition of English. We have focused on findings that nonnative input is less supportive of language development. Information transmitted through parent-child conversation is important to other aspects of learning, to the transmission of

belief systems within the family, and to psychosocial adjustment.<sup>66,67</sup> Those benefits may also be diminished when parents are limited to speaking a language they do not know well. Furthermore, there is evidence that some literacy-related skills transfer across languages and therefore experience in one language benefits development in another.<sup>67</sup>

## CONCLUSION

The claims that (1) children's rates of language acquisition depend on their language experience and (2) that both the quantity and quality of language experience affect language development are no longer controversial as statements about monolingual development. Recent evidence makes it clear that these statements apply to bilingual development as well. Average characteristics of bilingual children and individual differences among bilingual children arise to a substantial degree from effects of input.

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