

Linguistics and speech-language pathology: Combining research efforts toward improved interventions for bilingual children

**Adele W. Miccio, Carol Scheffner Hammer, and
Almeida Jacqueline Toribio**

The Pennsylvania State University, University Park

Introduction. Becoming proficient speakers of English is a multifaceted skill that all children living in the United States must accomplish in order to be successful. This process becomes more complex when the children's primary language is different from the oral and written language they encounter in school. Because bilingual children's language acquisition differs from that of their monolingual counterparts, they may be referred for speech and language services when their teachers or parents express concerns. Because the investigation of bilingual language acquisition may be most profitably viewed as a continuum from formal inquiry to applied study, services that involve bilingual children can be maximized if an interdisciplinary approach is taken.

Researchers in formal areas of linguistics study the differential status of two component systems of the bilingual child (e.g., disparities in phonological inventories and processes and the language convergence at all linguistic levels), with the aim of achieving an adequate characterization of bilingual competence. At the same time, researchers in more applied fields such as speech-language pathology assess the bilingual child's linguistic competence and usage to determine the role psychological and social factors play in the language acquisition process, and plan interventions for children presenting difficulty learning any aspect of language. In addition, they are increasingly called on to consult and collaborate with teachers and policy makers to plan educational programs for children whose home language differs from that of the language of instruction in school. Language interventions are complex and problematic in optimal situations. To address more difficult issues of bilingual language development, collaboration among research scholars in diverse disciplines is essential. Research efforts in the formal and applied disciplines of linguistics and speech-language pathology can contribute to each other in informing and advancing successful interventions for Spanish-speaking children.

This paper is organized as follows: First, we present examples of typical and atypical monolingual and bilingual phonology, illustrating the ways in which generative linguistics informs speech-language pathology. Second, we address

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selected aspects of the speech production and language use of children exposed to two languages, attending to the observed patterns of language apparent convergence and separation. Subsequent discussion expounds on the importance of an ethnographically oriented assessment to more effective clinical remediation. Finally, the paper ends with summary commentary on the benefits accrued from the cross-disciplinary approach advocated here.

Clinical linguistics: Examples of phonological disorder. Some children learning a language have difficulties at the phonological level of language acquisition, including problems with knowledge of phonetic segments and phonological constraints, and how that knowledge is implemented in speech production (Powell et al. 1999). These problems result in impaired intelligibility and most often difficulty in other language domains such as lexical and syntactic development. In addition, they may lead to later problems in developing literacy (Bird, Bishop, and Freeman 1995).

Early research in speech production disorders had little concern with the nature of phonology (Locke 1983). Rather, children who used few speech sounds or used them incorrectly were studied to determine if they had problems with sensory, cognitive, motor, or perceptual tasks. A speech sound production problem was presumed to be a peripheral motor problem. Much later, research began to attend to the nature of the phonology itself through the use of analytical procedures of generative linguistics (Dinnsen 1984). Attention to the linguistic aspects of speech production revealed that speech errors were not random but systematic patterns of difference from the typical acquisition. Researchers concluded that children's speech problems could derive from problems at higher levels.

Phonetic problems, however, do occur. Many clinicians and researchers continue to argue that problems with speech sound production are peripheral motor problems, a position that will likely be defended for years to come. We cannot yet distinguish unambiguously among levels of phonology. A child may misidentify phonetic cues to a phonological contrast and, consequently, store incorrect forms in lexical memory. Unless an obvious sensory or motor deficit such as deafness or cleft palate occurs, it is not easy to definitively determine whether a problem is related to the grammar of a sound system or to its physical properties (Powell et al. 1998). It is probable that problems arise from the interaction of a number of factors, including phonetic capabilities, the nature of the environmental input, and pressures from a rapidly developing lexicon (Locke 1983).

Monolingual phonology. Miccio and Ingrisano (2000) presented an example of a 5;3 (years; months) year-old monolingual English-speaking child with a systematic gap in her phonological system. Her consonant inventory contained all of the consonants of English except the fricative sound class. In other words, an

inventory constraint limited obstruents to stops. In addition, coronal harmony occurred among stops and palatal and glottal glides varied freely in onset position. Traditionally, intervention would target each missing or error sound following a sequence based on development norms (Smit et al. 1990). Sounds produced correctly some of the time would be treated first, and sounds would be taught in all positions. In other words, glides would be taught first, followed by dorsal stops, and finally each fricative. If, however, one applies linguistic principles to remediation, a different course of action is indicated. Implicational relationships among sounds would be exploited by teaching one sound as a vehicle for learning phonological features (Gierut 1998). The target sound is then chosen based on principles of markedness and naturalness, and within- and across-class generalization is predicted. In this case, the fricative /v/ was taught in the onset position of words. As a result, the child learned /v/ and its voiceless cognate /f/ and began to produce interdental fricatives and affricates. Moreover, coronal harmony disappeared and glides were produced target-correctly. Second, the coronal /z/ was taught in the onset position of words. Subsequently, the child acquired the remainder of the fricative class without further direct intervention. Thus, by providing limited information on a small subset of the problem, sounds, the child filled in the remainder of the paradigm.

Bilingual phonology. In the case of bilingual children, the normal process of acquiring two languages may be misdiagnosed as a phonological disorder. A child of the same age as the one previously described, for example, may substitute [b] for /v/, produce stops for interdental fricatives, and confuse nonanterior coronal fricatives and affricates. These would not be typical substitutions of a five-year-old monolingual English-speaking child, but they are all easily explained by the influence of Spanish on English acquisition. Allophonic versus phonemic differences may be confused in the second language. Unfortunately, a fear of misdiagnosis combined with minimal information on young children learning two languages has led to the lack of identification of bilingual children with problems learning language. To further illustrate this point, consider a third child, also bilingual. This child substitutes [w] for /l/, for example, saying [pɪwo] for “pillow.” In addition, this child says [tʊtbal] for “football,” [tutek] for “toothache,” and [hexo] for “hello.” Because the voiceless interdental fricative /θ/ does not occur in U.S. Spanish, and the velar fricative /x/ does occur in some Spanish dialects, this child was mischaracterized as a typical speaker of Spanish-influenced English. Clearly, however, the influence of Spanish does not explain the production of [t] for /f/ in “football,” and the child is too old to use consonant harmony. Although /x/ occurs in Spanish, its substitution for /l/ is not explained by either acquisition or Spanish influence. Thus, while some substitution types may possibly be attributed to the influence of Spanish, the child’s overall pattern argues against this explanation. Furthermore, examples from the child’s Spanish language

productions support the diagnosis of disorder. This child sometimes omitted obstruent stops in the onset position of Spanish words, a characteristic of atypical acquisition (Stoel-Gammon 1985). The child, for example, also substituted [t] for /s/ in “dos” and produced [gago] for “gato,” illustrating that her difficulties producing fricatives and her overuse of harmony were not limited to sounds that occur only in English. To be sure, distinguishing between typical and atypical acquisition of two languages requires a thorough understanding of both monolingual and bilingual acquisition.

Language acquisition in the context of language contact. Linguistic convergence is observed in other components of the developing language systems of bilingual children. Here again, it will be shown that a properly linguistic approach to the analysis of the patterns of early speech productions of bilingual children avails an appreciation of these linguistic forms as a source of facts appropriate to theories of language acquisition and language contact, rather than as peculiar linguistic artifacts of bilingual speech that deviate from the monolingual standard. As such, the ensuing paragraphs should confirm that studies grounded in linguistics can inform the work of scholars and practitioners in applied areas such as speech-language pathology.

Childhood bilingualism. While there is no universal agreement as to the precise definition of childhood bilingualism, many researchers distinguish between simultaneous (or primary) and successive (or secondary) acquisition: the former refers to the exposure to two languages before the age of three, while the latter refers to the exposure to one language in infancy and the second after age three (cf., McLaughlin 1984; Meisel 1994, 1989; De Houwer 1990, 1995). Perhaps more importantly, accounts of early bilingual acquisition must include an explicit description of the paradigm by which a child is exposed to two languages. A review of the literature reveals a variety of paradigms, among these the one-parent/one-language paradigm, the one-context/one-language paradigm, and the mixed-input paradigm (cf., Harding and Riley 1986; Hoffman 1991; and Romaine 1995). As noted in Babbe (1995), precisely how the manner in which two languages are presented affects the child’s ultimate bilingual attainment remains a much-debated topic. “Beginning with Leopold’s (1970, c. 1939–49) seminal study of his daughter Hildegarde, many researchers have argued that maintaining a strict one-parent/one-language paradigm could obviate the language contact normally in evidence, especially during the initial stages of bilingual development. Interestingly, it appears that regardless of the paradigm by which a child is exposed to two languages, some degree of language contact is invariably in evidence in the speech production of a child acquiring two languages simultaneously” (2–3).

Language contact phenomena defined. The majority of researchers who have observed language development in bilingual children have focused on the interaction of the two linguistic systems. In characterizing the contact phenomena attested, Babbe (1995) distinguishes two distinct stages of bilingual development: Phase I language contact refers to cross-linguistic interaction that occurs prior to the time that a child's two grammars are fully realized, while Phase II language contact refers to cross-linguistic interaction that occurs in the speech of a child who has two fully developed linguistic competencies. Moreover, a distinction can be made between pragmatic and grammatical bilingual ability, such that prior to having two fully developed grammars, bilingual children are assumed to use a pragmatic mode of language processing, and only after their two grammars are fully differentiated are they able to employ a syntactic mode of language processing (cf., Köppe and Meisel 1995).

In Phase I several forms of cross-linguistic influence are observed. Fusion refers to either the intra-lexical or inter-lexical juxtaposition of elements from two languages; such fusion may occur at the phonological, morphological, syntactic, or semantic level (cf., Babbe 1995, Köppe and Meisel 1995, Meisel 1994), as illustrated below.

PHONOLOGICAL FUSION (Genesee 1989: 162):

Swedish *katt* + Estonian *kass* → *kats* ('cat')

MORPHOLOGICAL FUSION (Petersen 1988: 480):

Danish *lav-* + English *-ing* → *laving* ('making')

SYNTACTIC FUSION (Miller 1995: 14–15):

- a. a pig and a kitty big and a snake big
- b. Only I like Burger King

SEMANTIC FUSION (Swain and Wesche 1975: 21):

Adult: Ask Helen if she'll turn off the lights, OK? (English)

Child: *Veux-tu fermer la lumière?* (French)

'Do you want to turn off the light?'

Child: You want to open the lights?

Adult: *Demande-lui de fermer les lumières.*

Ask her to turn off the lights.'

Child: Close the lights.

In Phase I Babbe also identifies language shifting, which refers to instances where a child shifts from one language to the other at a sentence boundary. Such shifting serves as a measure of a child's pragmatic ability to make the appropriate language choice according to interlocutor. Bilingual children also employ language shifting to draw attention to themselves or to assure that their utterance was understood. Last, language mixing in this phase is used to refer to all instances where lexical items from two languages are juxtaposed within an utterance; such mixing occurs at both the single word and the phrasal level.

LANGUAGE SHIFTING (Volterra and Taeschner 1978: 320):

Guilia: *Quetto parla no.* (Italian)

'This speaks no.'

(looking at and speaking to an Italian boy)

Guilia: *Das hier splecht nicht.* (German)

'This here speaks not.'

(looking at her mother and pointing to the boy)

Guilia: *Quetto è buono.*

'This is good.'

(and again she talks to the boy)

Guilia: *Das hier lieb.*

'This here is good.'

(looking and talking to her mother and pointing to the boy)

LANGUAGE SHIFTING (Fantini 1985: 68):

Mario: (to Mamá) *Mira . . . look, look!* (Spanish/English)

'Look.'

Mario: (to Papá) *Ven, ven, papá; come!*

'Come, come, papa.'

Mario: (to Mamá) *Batis (Beatriz), ven aquí; come on!*

'Beatriz, come here.'

LANGUAGE MIXING (Paradis and Genesee 1996: 18):

- a. *I pousse là.* (English/French)
'I am pushing there.'
- b. *Moi play this.*
'I play this.'

LANGUAGE MIXING (Redlinger and Park 1980: 350):

- a. *Ça pique, das hier.* (French/German)
'It itches, this here.'
- b. *Jeune fille ist das.*
'Young girl is that.'

In Babbe's Phase II the child is assumed to possess two fully developed grammars, such that any "mixing" attested may be manifested instead as code-switching (cf., Romaine 1995). Code-switching refers to a certain skill of the bilingual speaker that requires pragmatic and grammatical competence in both languages (cf., Timm 1993; Gumperz and Toribio 1999). Pragmatic competence in Phase II pertains to the ability to select the appropriate language (or language combinations) not only according to the interlocutor but also to the situational context and the topic of conversation, thereby reflecting the child's increased bilingual awareness (cf., Zentella 1997). Babbe enumerates various functions of such code-switching: from age 2;3 onward children engage in role-play and translation games (cf., for example, Saunders 1988); from age 3;0 onward children begin to comment on their own language use and ask their parents for translations (cf., for example, Köppe and Meisel 1995, Taeschner 1983); and finally, from age 4;0 onwards children use marked language choice to tease their interlocutor or exclude a third person from the conversation (cf., for example, Fantini 1985). The nature of the intersentential code-switching in evidence in Phase II clearly indicates separation of the two languages: entire segments can be identified as adhering to monolingual norms.

MARKED LANGUAGE CHOICE (Köppe and Meisel 1995: 288–289):

- a. A: (to M) *Mais maintenant comment ça s'appelle encore vorlesen?*
'But now how does one say again for to read?'
- M: *Qu'est-ce que tu veux savoir?*
'What do you want to know?'

- A: *Vorlesen.*
'To read.'
- M: *Lire.*
'To read.' (Annika 3;7)
- b. Iv: (to M) *Böse kleine männchen und dann ham sie a(ber) bestimmt angst.*
'Wicked little men and then they surely are afraid.'
- F: *Moi j'comprends pas, oui mais ça c'est de l'allmand dis donc.*
'I don't understand, yes but that's German.'
- M: *Elle comprend pas Marie-Claude, tu sais.*
'Marie-Claude doesn't understand, you know.'
- Iv: (to M) *Ça fait rien.*
'That doesn't matter.' (Ivar 4;4)

As children develop the ability to alternate between their languages for pragmatic aims, they extend this ability to switching within sentences, especially with bilingual interlocutors. In this phase, words and constituents no longer appear randomly in the intrasentential "mixes" of bilingual children; rather, the type of code-switching done correlates with the increased competence that the child possesses in the two component languages (Zentella 1997). (This tendency is observed among adults: the more proficient bilinguals exhibit a greater sensitivity to grammatical constraints on code-switching than their nonfluent counterparts.) Speaking specifically to bilingual children, McClure reports that "just as the monolingual improves his control over his verbal resources with age, so too does the bilingual. Further, just as there is a developmental pattern in the monolingual's syntactic control of his language, so too may such a pattern be found in the bilingual's control of the syntax of code-switching, which begins with the mixing of single items from one code into discourse in the other and culminates in the code-changing of even more complex constituents" (1981: 92). As should be apparent, then, regardless of age, a bilingual's language-mixing/code-switching-ability serves as a measure of bilingual competence (cf., Toribio 2001a, 2001b).

To recapitulate, the paradigms by which children come to be exposed to two languages are extremely diverse; however, what is noteworthy is that children acquiring two languages will invariably demonstrate some degree of language contact between the two languages. Moreover, the language contact that is

attested in the linguistic behavior of bilingual children is representative of diverse forms of cross-linguistic interaction, reflective of differential levels of bilingual ability, from incipient to advanced. While most investigators of bilingual language development agree that children exposed to two languages may combine elements from both, what is at issue is the importance ascribed to the interaction of the two linguistic systems. Thus, language-mixing issues must be considered when describing the language systems of bilingual children referred for evaluation and possibly intervention. To appropriately address these issues, the work of linguists related to this and other aspects of early bilingual language acquisition must be accessible to speech-language pathologists in order to assure accurate assessment of children's linguistic systems.

Language assessment and intervention in context. An adequate assessment of bilingual acquisition must also take account of nonlinguistic factors, as children acquire language in a social and cultural context. Three essential components of this context include cultural beliefs about language, development, and parenting; cultural communication styles; and environmental factors that influence language acquisition. A large body of research supports the view that cultural values and beliefs are reflected in parents' child-rearing practices. It is well documented that parents employ child-rearing practices that are designed to assist their children in becoming competent members of their culture (Rogoff 1990). Because cultures may hold particular beliefs and value different competencies, differences in parenting beliefs and practices exist between cultural groups. Similarly, cultural beliefs and norms are reflected in the language and communication styles between parents and children (cf., Schwartz 1981; Ochs and Schieffelin 1984). As stated by Ochs and Schieffelin (1984: 284), "How caregivers and children speak and act toward one another is linked to cultural patterns that extend and have consequences beyond specific interactions observed." Additionally, environmental factors such as maternal education, family income or poverty, and maternal depression may impact children's language acquisition. Specifically, research has documented that children of parents with higher levels of education perform better on cognitive measures (Auerbach, Lerner, Barasch, and Palti 1992) and have better language outcomes than children of parents with lower educational levels (cf., Schacter et al. 1979; Hart and Risley 1995; Hoff-Ginsberg 1991; Tomblin, Hardy, and Hein 1991). Related to this is family income. Children living in low-income or impoverished families tend to have parents with lower educational levels, and they have less access to resources, material goods, and opportunities as compared to middle-income and wealthy families. In addition, recent research has demonstrated that chronic maternal depression in combination with low maternal sensitivity is associated with lower cognitive-linguistic functioning and school readiness at age three (NICHD Early Child Care Research Network 1999). The effects of depression, however, can be buffered through

social support, as has been shown in Hispanic populations (Guarnaccia, Angel, and Worobey 1991; Leadbeater and Linares 1992). We assert that all three of these components must be understood in order to appropriately assess the language abilities of bilingual children and intervene with children when additional services are warranted. In the following sections, an approach for assessing children's abilities that takes into account these contextual variables will be presented. This discussion begins with a review of how traditional assessments are performed and then presents an ethnographic approach for working with bilingual children.

The assessment. A standard assessment of a child's language and communication abilities typically consists of a structured interview during which the speech-language pathologist asks the child's parents a preset list of questions about the child's developmental history and language development. In addition, standardized language tests are administered, and a language sample is elicited from the child by the clinician. The difficulty with this approach is that the information obtained does not typically afford the opportunity to learn about the parents' cultural values and beliefs or about the parents' views on language and their child's development. Additionally, because this approach emerges from the scientific tradition, which seeks to test and confirm hypotheses, speech-language pathologists often compare what is learned about the child's and parents' interaction styles to the white, middle-class norm. If the child and parents differ from this norm, which is likely for a bilingual family, intervention programs are developed that assist the child and family in meeting this norm.

An ethnographic approach to assessment. We argue that an ethnographic approach to assessment yields valuable information about the cultural values and beliefs the parents hold, as well as provides the speech-language pathologist with the opportunity to learn about the communication styles used by the child and parents and to identify factors in the child's environment that may support or hinder the child's acquisition of language. The reason for this is that an ethnographic approach follows an inductive process. The goal of this process is to ascertain the cultural perspectives of the child's parents and to develop an understanding of language and communication behaviors in their cultural context.

An ethnographic assessment consists of the triangulation of data from multiple sources (Hammer 1998; Crago and Cole 1990). The sources include written documents, semi-structured interviews, observations of the child interacting with family members and/or significant caregivers, and language samples collected in a naturalistic environment. Prior to the assessment, the speech-language pathologist consults written documents, such as medical and educational reports, to learn about the child's developmental and medical history. In addition, she consults journal articles and books to acquire information about the family's culture if she lacks the requisite knowledge.

When the speech-language pathologist meets with the family, she conducts a semi-structured interview that consists of a series of open-ended guide questions. A semi-structured interview is similar to a traditional interview in that one of the speech-language pathologist's goals is to obtain a developmental history about the child. It differs from the traditional format in that the speech-language pathologist also strives to determine the parents' beliefs about language acquisition, their child's language abilities, their concerns about their child, and their views about services and their role in it. The speech-language pathologist follows the parents' lead during the interview and explores each topic thoroughly before moving on to a related topic.

Information gained through a semi-structured interview may be very informative as to how parents view their child's language acquisition, which in turn has implications for intervention services. Hammer and Weiss (2000) have interviewed African American mothers about their children's language acquisition and found beliefs vary. Mothers responded with a range of responses to the question about their beliefs regarding children's acquisition of language. A large number of mothers stated that children learned to talk by watching and listening to others. Another subset indicated that imitation of others' speech played a significant role in children's acquisition of language. A smaller subset thought that children learned to talk by others talking to them, and another group believed that children learned to talk by listening to music, because the rhythm of music assisted their children in learning the rhythm of language. When asked what they had done to assist their children to learn to talk, a small group of mothers with a low educational level and with low incomes thought that language developed naturally. As a result, they did not employ specific activities in order to foster their children's language acquisition. Others believed that they could have an impact on their children's language and provided a list of activities and strategies that they used to assist their children. Hammer (2000) has also interviewed Hispanic mothers about their children's written language development. Once again, mothers held a range of views. One mother reported that children learned to read by people talking about the pictures in a book. Another mother believed that children learned by making up their own stories about the pictures (rather than from the adult reading the books to them). Others felt that children learned to read by listening to parents read books to them, and others believed that children learned by parents showing a true interest in books.

In addition to learning about parents' beliefs, information about elements of the environment that may impact the child's development can be ascertained. Because emphasis is on following the parents' lead rather than following a pre-set agenda, parents often volunteer information about significant life events without being prompted by the speech-language pathologist. For example, parents may discuss that they do not have enough money to buy toys for their children.

Parents also may talk about tragic events in their lives. During interviews that we have conducted, parents have shared their experiences of loss, abuse, and violence, as well as feelings of depression and isolation. Such events and sentiments may impact how the parents raise their child or may impact the parents' emotional well-being, which in turn may impact the child's development.

Observations of the child interacting with his or her parents and with significant individuals in the home as well as the school are another major component of an ethnographic assessment. These observations provide the speech-language pathologist with information about the interactional styles of the child's culture and family. Through the observations, information is ascertained about who interacts with the child, what the appropriate topics of conversation are, what activities adults take part in with the child, and what modes of communication are used. In addition, information is gained about what the child's and the adult's roles are during interactions (Crago and Cole 1990; Hammer 1998). In a traditional assessment, these types of analyses are not performed. Instead, observations of the child's language are typically restricted to interactions between the child and speech-language pathologist and occasionally include general observations of the child interacting in his or her classroom.

When conducting observations during an ethnographic assessment, language samples are also collected from the child while interacting with familiar interlocutors, as opposed to with the speech-language pathologist who is typically unfamiliar to the child. As in a traditional assessment, the language samples are transcribed in order to examine the content and form of the child's language. In analyzing the samples, it is essential, however, that the speech-language pathologist takes into account the impact the child's communicative partner and the setting may have on the child's language production. For example, a child may respond differently to a bilingual speaker who is not from his or her community than to a person from the community, particularly if the nonnative person does not have physical characteristics similar to the people of that community. If the child does not perceive the interlocutor as a speaker from the home community, the child may speak primarily in English. In addition, samples collected in a school setting may elicit more English utterances from the child because the child perceives the language of the school to be English. We have found this to be true even when the child's teacher is bilingual and from the child's community.

Intervention. Information gained through an ethnographic assessment is then used in developing an intervention plan if the child has been found to have a language disorder. We assert that developing a program that incorporates and/or is sensitive to the parents' beliefs, cultural and family interaction styles, and environmental factors will maximize the intervention because the program is in keeping with the family's beliefs and styles. This approach is different from the traditional approach in which the views and communication styles of the Anglo-

American, middle-class culture are used as the basis for the recommendations given to the parent. More specifically, a standard approach often entails the speech-language pathologist instructing the parents to set aside time to play with their children and to use intervention strategies that are based on the styles of Anglo-American, middle-class mothers that have been described in the literature. The following example will illustrate this point.

Carmen, the mother of a preschool child, had an eleventh-grade education and did not work outside the home. During the interview, Carmen shared that she believed that children learned to talk by listening and watching others. In addition, she stated that because language developed naturally, she did not incorporate play activities into her child's daily routine in order to support her daughter's language development. Triangulation of data from the interview and observations revealed that Carmen allowed her child to set her own agenda during the day, including allowing her child to determine when she played with her mother. Typically, Carmen's daughter played by herself or with her older brothers. Interactions with her mother occurred spontaneously. In other words, Carmen did not plan to "play" with her child on a regular basis, nor did she have a particular teaching agenda when she interacted with her child. Although her daughter was exposed to valuable language models during these interactions, Carmen's goal appeared to be a social rather than a teaching interaction with her daughter. The dyad's interactions often involved turn-taking episodes during which they practiced routines. For example, the mother and child would often pretend to call friends and relatives on the phone during which time interactive routines were practiced. In addition, they would also rehearse familiar songs and sayings. If a traditional intervention plan were developed for Carmen and her child, we assert that the dyad would have difficulty following through with this plan. The reason for this is that in a traditional plan Carmen would be instructed to set aside time and play with toys with her child. In addition, she would be told to comment on her daughter's actions using utterances that were developmentally appropriate for her child. Carmen and her child, however, were not accustomed to playing with toys. During the observations, Carmen attempted to initiate play with toys with her daughter. Her daughter responded by playing briefly with her mother and then disengaging from her mother while continuing to play with the toy. The speech-language pathologist would be more successful if she developed an intervention plan that built upon the dyad's communication style. Rather than telling the mother to set aside time, specific suggestions and example language models could be provided to the mother that could be incorporated into the social routines that had been established by the dyad. As a result of this approach, we hypothesize the parents will be better able to participate in and carry out intervention programs. This, in turn, maximizes the effectiveness of the intervention.

Interdisciplinary collaboration: From description to intervention. We've noted that bilingual children may be misdiagnosed as speech-language disordered when their linguistic productions do not approximate monolingual English- or Spanish-language norms. Developing bilingual systems, nonetheless, are well formed in their own right, and the observed differences may be attributed to the interaction between the languages in question. The nature of a child's own unique system, however, may go unexplored in the absence of a linguistically informed analysis. Alternatively, collaboration across disciplines results in better informed research that follows a continuum from formal linguistic inquiry to applied studies with the ultimate goal of improved intervention.

The direction of our collaboration includes describing the bilingual child's full language competence with due consideration of the interaction between the component systems. Although the language component is a key factor in the planning of intervention, we must also move beyond standard linguistic description to attend to language acquisition and usage in context, for example, the school, home, and larger community environments. Without a thorough understanding of the community and home situation, practitioners cannot design an appropriate intervention that takes into account factors that affect the language input. As illustrated, the latter cannot be underestimated in the development of appropriate interventions for bilingual children because differences in language usage (e.g., the alternating use of Spanish and English, the selection of specific dialectal forms, the reluctance to participate in particular linguistic activities, limitations on language productions) may be due to family practices and community norms, rather than to linguistic deficiencies. Positive qualities of the home environment as well as the support of the community environment may mediate the effects of limited language exposure on language development.

In summary, language interventions are complex and problematic in optimal situations. To address the more difficult issues of bilingual language development, collaboration among research scholars in diverse disciplines is essential. As has been demonstrated, research efforts in the formal and applied disciplines of linguistics and speech-language pathology can contribute to each other in informing and advancing successful interventions for bilingual children.

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REFERENCES

- Auerbach, J., Y. Lerner, M. Barasch, and H. Palti. 1992. "Maternal and environmental characteristics as predictors of child behavior problems and cognitive competence." *American Journal of Orthopsychiatry* 62: 409-420.

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- Babbe, Meredith. 1995. "Language contact in childhood bilingualism." MA thesis, University of California, Santa Barbara.
- Bird, J., D. V. M. Bishop, and N.H. Freeman. 1995. "Phonological awareness and literacy development in children with expressive phonological impairments." *Journal of Speech and Hearing Research* 38: 446–462.
- Crago, M., and E. Cole. 1990. "Using ethnography to bring children's communicative and cultural worlds into focus." In Tanya Gallagher (ed.), *Pragmatics of language*. San Diego: Singular Press. 99–131.
- De Houwer, Annick. 1990. *The acquisition of two languages from birth: A case study*. Cambridge: Cambridge University Press.
- De Houwer, Annick. 1995. "Bilingual language acquisition." In Paul Fletcher and Brian MacWhinney (eds.), *The handbook of child language*. Cambridge, Mass.: Blackwell. 219–250.
- Dinnsen, Daniel A. 1984. "Methods and empirical issues in analyzing functional misarticulations." ASHA monograph 22: *Phonological theory and the misarticulating child*. Rockville, Md.: American Speech and Hearing Association. 5–18.
- Fantini, Alvino. 1985. *The language acquisition of a bilingual child*. Clevedon, U.K.: Multilingual Matters.
- Genesee, Fred. 1989. "Early bilingual development: One language or two?" *Journal of Child Language* 16: 161–179.
- Gierut, Judith A. 1998. "Treatment efficacy: Functional phonological disorders in children." *Journal of Speech, Language, and Hearing Research* 41: S85–S100.
- Guarnaccia, P., R. Angel, and J. Worobey. 1991. "The impact of marital status and employment status on depressive affect for Hispanic Americans." *Journal of Community Psychology* 19: 136–149.
- Gumperz, John, and Almeida Jacqueline Toribio. 1999. "Code-switching." In F. Keil and R. Wilson (eds.), *The MIT encyclopedia of the cognitive sciences*. Cambridge, Mass.: MIT Press. 118–119.
- Hammer, Carol Scheffner. 1998. "Toward a 'thick description' of families: Using ethnography to overcome the obstacles to providing family-centered early intervention services." *American Journal of Speech-Language Pathology* 7: 5–22.
- Hammer, Carol Scheffner. 2000. "The book reading behaviors of Puerto Rican mothers and their preschool children." Unpublished manuscript.
- Hammer, Carol Scheffner, and Amy L. Weiss. 2000. "African American mothers views about their infants' language development." *American Journal of Speech Language Pathology* 9: 126–140.
- Harding, Edith, and Philip Riley. 1986. *The bilingual family: A handbook for parents*. Cambridge: Cambridge University Press.
- Hart, B., and T. Risley. 1995. *Meaningful differences in the everyday experiences of young American children*. Baltimore: Paul H. Brookes.
- Hoff-Ginsberg, E. 1991. "Mother-child conversation in different social classes and communicative settings." *Child Development* 62: 782–796.
- Hoffmann, Charlotte. 1991. *An introduction to bilingualism*. New York: Longman.
- Köppe, Regina, and Jürgen Meisel. 1995. "Code-switching in bilingual first language acquisition." In Lesley Milroy and Pieter Muysken (eds.), *One speaker, two languages*. Cambridge: Cambridge University Press. 276–301.
- Leadbeater, B., and O. Linares. 1992. "Depressive symptoms in black and Puerto Rican adolescent mothers in the first three years postpartum." *Development and Psychopathology* 65: 451–468.
- Leopold, Werner F. 1970. *Speech development of a bilingual child*. 4 Vols. c. 1939–1949. New York: AMS Press.
- Locke, John L. 1983. "Clinical phonology: The explanation and treatment of speech sound disorders." *Journal of Speech and Hearing Disorders* 48: 339–341.
- McClure, Erica. 1981. "Formal and functional aspects of the code-switched discourse of bilingual children." In Richard Duran (ed.), *Latino language and communicative behavior*. Norwood, N.J.: Ablex. 69–94.

- McLaughlin, Barry. 1984. "Early bilingualism: Methodological and theoretical issues." In Michel Paradis and Yvan Lebrun (eds.), *Early bilingualism and child development*. Lisse, Netherlands: Swets and Zeitlinger. 19–45.
- Meisel, Jürgen. 1989. "Early differentiation of languages in bilingual children." In Kenneth Hyldenstam and Loraine Obler (eds.), *Bilingualism across the lifespan: Aspects of acquisition, maturity, and loss*. Cambridge: Cambridge University Press. 13–40.
- Meisel, Jürgen. 1994. "Code-switching in young bilingual children: The acquisition of grammatical constraints." *Studies in Second Language Acquisition* 16: 413–439.
- Miccio, Adele W., and Dennis R. Ingrisano. 2000. "The acquisition of fricatives and affricates: Evidence from a disordered phonological system." *American Journal of Speech-Language Pathology* 9: 214–229.
- Miller, Elaine. 1995. "Language interaction in two bilingual four-year-olds." Unpublished manuscript, University of California, Santa Barbara.
- NICHD Early Child Care Research Network. 1999. "Chronicity of maternal depressive symptoms, maternal sensitivity, and child functioning at 36 months." *Child Development* 35: 1297–1310.
- Ochs, E., and B. Schieffelin. 1984. "Language acquisition and socialization: Three developmental perspectives and their implications." In R. Shweder and R. LeVine (eds.), *Culture theory: Essays on mind, self, and emotion*. New York: Cambridge University Press. 276–320.
- Paradis, Johanne and Fred Genesee. 1996. "Syntactic acquisition in bilingual children: Autonomous or interdependent." *Studies in Second Language Acquisition* 18: 1–25.
- Petersen, Jennifer. 1988. "Word-internal code-switching constraints in a bilingual child's grammar." *Linguistics* 26: 479–493.
- Powell, Thomas W., Mary Elbert, Adele W. Miccio, Christine Strike-Roussos, and Judith A. Brasseur. 1998. "Facilitating [s] production in young children: an experimental evaluation of motoric and conceptual treatment approaches." *Clinical Linguistics and Phonetics* 12: 127–146.
- Powell, Thomas W., Adele W. Miccio, Mary Elbert, Judith A. Brasseur, and Christine Strike-Roussos. 1999. "Patterns of sound change in children with phonological disorders." *Clinical Linguistics and Phonetics* 13:163–182.
- Redlinger, Wendy, and Tschang-Zin Park. 1980. "Language mixing in young bilinguals." *Journal of Child Language* 7: 337–352.
- Rogoff, B. 1990. *Apprenticeship in thinking*. New York: Oxford University Press.
- Romaine, Suzanne. 1995. *Bilingualism* (second edition). Oxford, U.K.: Blackwell.
- Saunders, George. 1988. *Bilingual children: from birth to teens*. Clevedon, U.K.: Multilingual Matters.
- Schacter, F. with R. Marquis, E. Shore, C. Bundy, and J. McNair. 1979. *Everyday mother talk to toddlers*. New York: Academic Press.
- Schwartz, T. 1981. "The acquisition of culture." *Ethos* 9: 4–17.
- Smit, Ann Bosma, L. Hand, J. Freilinger, John E. Bernthal, and A. Bird. 1990. "The Iowa articulation norms project and its Nebraska replication." *Journal of Speech and Hearing Disorders* 55: 779–798.
- Stoel-Gammon, Carol. 1985. "Phonetic inventories, 15–24 months: A longitudinal study." *Journal of Speech and Hearing Research* 28: 505–512.
- Swain, Merrill, and Mari Wesche. 1975. "Linguistic interaction: Case study of a bilingual child." *Language Sciences* 17: 17–22.
- Taeschner, Traute. 1983. *The sun is feminine: A study on language acquisition in bilingual children*. New York: Springer-Verlag.
- Timm, Leonora. 1993. "Bilingual code-switching: An overview of research." In Barbara J. Merino, Henry T. Trueba, and Fabián Samaniego (eds.), *Language and culture in learning: Teaching Spanish to native Spanish speakers*. Washington, D.C.: The Falmer Press. 94–112.

- Tomblin, J. Bruce, J. C. Hardy, and H. A. Hein. 1991. "Predicting poor-communication status in preschool children using risk factors present at birth." *Journal of Speech and Hearing Research* 34: 1096–1105.
- Toribio, Almeida Jacqueline. 2001a. "On the emergence of bilingual code-switching competence." *Bilingual: Language and Cognition*. Forthcoming.
- Toribio, Almeida Jacqueline. 2001b. "Assessing bilingual code-switching competence." *International Journal of Multilingualism*. Forthcoming.
- Volterra, Virginia, and Traute Taeschner. 1978. "The Acquisition and Development of Language by Bilingual Children." *Journal of Child Language* 5: 311–326.
- Zentella, Ana Celia. 1997. *Growing up bilingual*. Malden, Mass.: Blackwell Publishers.