

Bilingual Children Referred for Psychiatric Services: Associations of Language Disorders, Language Skills, and Psychopathology

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ABSTRACT

Objective: To investigate (1) the prevalence of language deficits and disorders and (2) the relationship of bilingual language skills and psychopathology, in Spanish-English bilingual children referred for child and adolescent psychiatry services. **Method:** Bilingual language skills, emotional/behavioral problems, sociodemographics, immigration variables, and nonverbal IQ were studied in 50 consecutively referred children. **Results:** Estimated prevalence was high for language deficits (48%) and disorders (41%), with most cases (>79%) being of the mixed receptive-expressive type. In children with clinically significant emotional/behavioral problems, bilingual language skills were strongly and inversely correlated with problem scores, particularly global problems ($r = -0.67, p < .001$); social, thought, and attention problems ($r \geq -0.54, p < .004$); delinquency ($r = -0.66, p < .001$); and aggression ($r = -0.52, p < .01$). These correlations remained significant after IQ adjustment. **Conclusions:** Prior findings from monolingual children were confirmed in this bilingual sample, namely (1) the high prevalence of mixed receptive-expressive and other language disorders and delays and (2) the close tie between poor language skills and emotional/behavioral problems. The data strongly suggest the clinical importance and feasibility of language assessment and the significance of receptive problems in bilingual children referred for psychiatric services. A safe approach is to fully assess language skills, rather than misattributing these children's language delays to normal bilingual acquisition processes. *J. Am. Acad. Child Adolesc. Psychiatry*, 2002, 41(6):712–722. **Key Words:** bilingualism, psychopathology, language disorders/delays.

Language skills are related to child psychopathology (Beitchman et al., 1996a; Cantwell and Baker, 1991; Toppelberg and Shapiro, 2000). On the one hand, language problems often co-occur with poor adaptations and psychopathology, according to both epidemiologi-

cal and clinical studies (Beitchman et al., 1996b; Cantwell and Baker, 1991; Giddan et al., 1996). On the other, strong language skills are substrate to many protective factors, such as IQ, communicative and social competence, and academic success (Hinshaw, 1992). These relations, mostly found in research with monolingual children, may have particular relevance to bilingual children. As we witness the largest wave of child immigration in American history (Suarez-Orozco and Suarez-Orozco, 2001), we must consider that bilingualism is common and becoming more prevalent. It is estimated that 6 million American children (14% of the U.S. child population, mostly U.S.-born children of immigrant parents) have English as a second language and a different language (most commonly Spanish) as the home language (U.S. Census Bureau, 1990). Focusing on the relationship between language and psychopathology in bilingual children is critical for clinical, educational, and policy purposes. For instance, language delays in bilingual chil-

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dren may go unsuspected, because of beliefs that they are part of normal bilingual development or that language tests for bilingual populations are not available. If unsuspected, language impairments are associated with higher levels of delinquent and other externalizing behaviors and, by definition, with the denial of highly needed remedial services (Cohen and Horodezky, 1998). The main purpose of the current report is to explore relations between language skills and emotional/behavioral problems in a bilingual child population referred for psychiatric services. At the same time, it addresses beliefs about the "normalcy" of language delays and the feasibility of testing bilingual youths.

The prevalence of language disorders among children referred for psychiatric services is very high, ranging between 30% and 75% (Cantwell and Baker, 1991). In one study, approximately 53% of children referred to urban community clinics suffered from a language disorder (Cohen et al., 1993). Of these children, approximately half had not been diagnosed prior to the referral. Epidemiological and clinical longitudinal studies have shown that language disorders predict greater severity and prevalence of (1) attention-deficit/hyperactivity disorder (ADHD) and externalizing disorders, (2) learning disorders, and (3) internalizing disorders (anxiety and depression) (Beitchman et al., 1996b; Cantwell and Baker, 1991; Toppelberg and Shapiro, 2000). The *DSM-IV* (American Psychiatric Association, 1994) defines two types of language disorders: expressive and mixed receptive-expressive; a third form, pure receptive disorder, is rarely if ever found. Although more likely to be overlooked than expressive delays, receptive delays are the strongest psychopathology predictors, particularly of aggressive, hyperactive, and anti-social outcomes (Beitchman et al., 1996b; Toppelberg and Shapiro, 2000). Clinical and language researchers in this area have strongly advocated for a low threshold of suspicion and the early detection of language disorders as unsuspected language disorders are associated with more severe psychopathology and are not serviced adequately, even at later points in the school trajectory (Cantwell and Baker, 1991; Cohen and Horodezky, 1998). Although these studies have firmly established the relevance of language to developmental psychopathology, most, if not all, explicitly excluded bilingual children or those who spoke languages other than English. Our study precisely focuses on these previously excluded children.

Bilingual skills comprise a wide range of competencies and performances. Proficient bilingualism (native

mastery of two languages) is associated with sociocultural, linguistic, and cognitive advantages (Diaz, 1985; Hakuta, 1986). While clear benefits have been documented in children with proficient bilingualism, persistent nonproficient bilingualism may be detrimental, as indicated by the increased educational, social, and economic risk of low English proficiency (Hakuta, 1986). It is conceivable that psychopathology interferes with bilingual language acquisition. For instance, the specific social, cognitive, and linguistic strategies that normal children use to acquire a second language (Wong Fillmore, 1979) are likely undermined in children with psychopathology. Conversely, it is also conceivable that bilingual skills protect from and bilingual deficits predispose to psychopathology. Low bilingual proficiency may be chronically stressful, while sudden and complete language immersion of a child may be acutely stressful. Stress may trigger, cause, or aggravate psychopathology (Mazure, 1995). In addition, low bilingual proficiency may constitute a vulnerability leading to impaired emotional and behavioral modulation and social adjustment. Poor language skills predict social skill deficits (Beitchman et al., 1996b), and communicative and social competences are correlated (Farmer, 1997) in monolingual children. Language-delayed monolingual children are often poorly socialized, shy, aloof or less outgoing (Paul and Kellogg, 1997), and poorly accepted by their peers (Craig, 1993). Bilingual children with limited English skills are treated "as babies," not spoken to and often ignored by their peers (Rice et al., 1991; Tabors, 1997). Language in childhood is a major tool for emotional, behavioral, and cognitive self-regulation and for social communication (Dale, 1996). However, while it has been demonstrated that language deficits in monolingual children (i.e., deficits in *monolingual* language skills) are associated with psychopathology, a similar association of low *bilingual* language skills is not known. Likewise, it is unclear whether the prevalence and types of language disorders in bilingual children are similar to those of their monolingual peers.

To start addressing this knowledge gap, the current study investigated language competence, emotional/behavioral problems, and related variables in a sample of 50 bilingual children consecutively referred for outpatient child and adolescent psychiatric services. The research questions for this sample are (1) what is the prevalence of language deficits and disorders and their types (expressive, receptive, and mixed receptive-expressive) and how does it compare with that in monolingual children? and (2) what is

the relation between bilingual language competence and psychopathology? The study has two aims: (1) to describe the prevalence of language deficits and disorders and (2) to test the hypothesis that bilingual language skills and emotional/behavioral problems are significantly and inversely correlated in referred children. Questions about causality, although clearly important, are beyond the scope of this study, which aims only at describing the sample and establishing basic language–psychopathology relationships. The research questions formulated above have far-reaching clinical and educational implications. The high rate of underdiagnosis of childhood language disorders (Toppelberg and Shapiro, 2000) may be even higher in this clinical population, if what appears as language delay is misattributed to normal bilingual development and if language evaluations are not conducted because of the belief that language tests for bilingual individuals are not available. If the commonly unsuspected receptive deficits were as common as in monolingual children, bilingual children would be even more seriously underdiagnosed and underserved.

METHOD

Subjects and Recruitment Procedure

All eligible children consecutively referred to an outpatient Latino child and adolescent psychiatry clinic in a 30-month period were invited to participate. The clinic was part of a public city hospital serving an urban population. Most children were referred to the clinic by pediatricians, the schools, the adult Latino mental health clinic, or the Massachusetts Department of Social Services. Most paid for their medical care through Medicaid or the free care pool funded by the state. Included were Spanish-language minority children, i.e., whose mothers, families, and/or caregivers communicated solely or mainly in Spanish. Excluded were children with a history or presence of severe developmental disorder such as autism, aphasia, or other severe sensory-motor sequelae of neurological trauma or disorder (paralysis, deafness, blindness). All children had varying degrees of bilingualism and English exposure. All potential participants, aged 5–16 years, received an invitation letter and phone calls in Spanish and/or English. After study was described, children and parents who agreed to participate were evaluated for 2 hours, either at the clinic or during home visits offered after “no shows” or when coming to the clinic was difficult for the family. The evaluations were completed in 1997, 1998, and 1999; most of them (40) in the 13 months following March 1998. The investigators were bilingual/bicultural; most were native Spanish speakers. The Cambridge Hospital’s institutional review board approved the study. Spanish versions of the consent forms were made available. For parents who were illiterate, the forms were read and explained. Written parental informed consent and verbal child assent were obtained.

Measures

Sociodemographic, immigration, and acculturation variables were covered through questionnaires based on Hollingshead’s Four Factor Index of Social Status (1975) and on methodology used by the U.S.

Census (1990) (Table 1). On the basis of data about children’s and parents’ place of birth (abroad or the United States) and children’s age of arrival (if born abroad), children were classified into six “immigration depth” levels following Hakuta and D’Andrea (1992). For instance, depth 1 included immigrant children who arrived after age 10, while depths 4 and 5 included U.S.-born children with two parents (depth 4) or only one parent (depth 5) born abroad (also see Table 1). Acculturation information included language use (adapted from the WLPB-R; see below): the child’s relative use of first and second language in different settings (school, home) and/or with different people (siblings, friends, with and between adults at home), measured with a Likert scale (1 = only English, 5 = only Spanish, 3 = balanced use).

Nonverbal Intelligence. The subjects were tested with the Test of Nonverbal Intelligence (TONI), second version. The TONI is a culture-fair measure of abstract/figural problem solving, used for the intellectual appraisal of children whose test performance may be confounded by language impairment or second-language barriers. The instructions can be entirely pantomimed. The subject responds by pointing or gestures. The TONI has been standardized with minority, Hispanic, and non-English-speaking individuals (Brown et al., 1990).

Emotional and Behavioral Problems. The Child Behavior Checklist (CBCL) and Teacher’s Report Form (TRF) (Achenbach and Edelbrock, 1991) are parent and teacher questionnaires widely used in published cross-cultural analyses on more than 13,000 children (Crijnen et al., 1997); culturally sensitive Spanish versions also are extensively used and have been standardized in Puerto Rico and Latin America (Bird, 1996). Each checklist has approximately 113 items and yields global, 2 broad-band (Internalizing and Externalizing), and 8 problem scale scores. The Internalizing broad-band score derives from the first three problem scales (Withdrawn, Somatic Complaints, and Anxious/Depressed), the Externalizing score from the last two problem scales (Delinquent and Aggressive Behaviors), and three other scales (Social Problems, Thought Problems, and Attention Problems) are not part of any broad-band score. Empirically derived syndromes based on CBCL scores have good agreement with *DSM-III-R* and *DSM-IV* categories (Achenbach and Edelbrock, 1991; American Psychiatric Association, 1994). To ascertain the presence of emotional/behavioral problems, two *T* score cutoffs recommended by Achenbach and Edelbrock (1991) were used: a high, “clinical range” cutoff of 70 (representing the 98th percentile of the normative CBCL sample) and a low, “borderline clinical” cutoff of 65 (or 93rd percentile).

Language Competencies. The five Oral Language (OL) cluster tests of the Woodcock Language Proficiency Battery-Revised (WLPB-R) (Woodcock, 1991) were used. The WLPB-R is an individually administered battery, with published reliability and validity. The WLPB-R is well standardized in Spanish and English. The five OL tests measure oral language ability, with two primarily focusing on the receptive function and two others on the expressive function. Language deficits are usually defined by OL standard scores of 81 or lower (1.25 SD below the mean or 12th percentile) (Leonard, 1998). For our bilingual sample we used the same cutoff, but for *both* English and Spanish; this cutoff is much more conservative in bilingual than it would be in monolingual children, i.e., it would identify language deficits in a much smaller proportion of children, as English and Spanish abilities are only partially intercorrelated. As an illustration, if the general bilingual child population had language skills in Spanish and English that correlated at a 0.6 level, i.e., sharing a variance of 36% (a likely assumption), approximately 4% of this population would be categorized as having a language disorder. In a general monolingual population, this level of categorization would be quite conservative, as it would require a stringent cutoff of 2 SD or the corresponding standard score of 70 to obtain the same 4%, in contrast with considerably higher epidemiological estimates of approximately 7.4% (Tomblin

et al., 1996). To diagnose a language disorder, the *DSM-IV* also requires language scores to be significantly lower than nonverbal IQ scores (American Psychiatric Association, 1994), a requirement known as the IQ-discrepancy criterion. Because of the strong suggestion of mental retardation, children with IQ scores below 70 were excluded from the language disorder analysis only.

For descriptive purposes, we classified children with language deficits as having pure expressive, mixed receptive-expressive, or pure receptive forms, based on expressive and/or receptive tests' scores, using the cutoff of 81. In addition, language disorders were defined using a nonverbal IQ discrepancy of 15 standard-score points. Semilingualism and limited bilingualism, terms used in child language research to describe bilingual children with poor abilities in both languages, are defined in this study as language deficits, following *DSM-IV*.

Statistical Analysis

Descriptive statistics were obtained, and principal components analysis and canonical correlations were used for data reduction and to minimize multicollinearity effects. We estimated bilingual language skills by averaging the Spanish and English standardized scores for each child. The resulting score was calculated by converting WLPB-R OL cluster standard scores into English and Spanish OL cluster percentile scores, then by taking the geometric mean of these percentiles, i.e.,

$$\sqrt{\text{Spanish Woodcock OL}_{\text{Percentile}} \times \text{English Woodcock OL}_{\text{Percentile}}}$$

and finally by transforming the mean into a standard score (z , in which mean = 0, SD = 1). As Latino groups are heterogeneous and to capture this sample's unique variability, CBCL and TRF composites were extracted from the CBCL and TRF subscores using principal components analysis.

To explore the central hypothesis, simple (bivariate) correlations were obtained between bilingual language skills and three sets of emotional/behavioral problem scores including global, broad-band (Internalizing and Externalizing), and problem scale scores. The effect of potential confounding was explored for sociodemographic, immigration, acculturation, and IQ variables, individually and in group combination. To control for potential individual confounds, partial correlations were obtained, correcting for the contribution of those individual variables whose correlations with both bilingual language skills and emotional/behavioral problem scores were significant and >0.25 . To control for variable combinations acting as potential confounds, we conducted partial correlations using a control factor extracted through canonical correlation. A canonical factor expresses the main dimension of correlation between two variable sets, i.e., the fraction of the variability in set 1 that correlates with (or could be due to) the influence of the variables in set 2. To obtain the control factor, set 1 included bilingual language skills and the CBCL composite, and set 2 the potential confounds (age, gender, IQ, immigration depth, proportion of lifetime resided in the United States, language use, and maternal education). Successive canonical correlations eliminated at each step the set 2 variable with the lowest canonical loading, until a canonical factor significantly correlated with its set 1 counterpart was obtained. All correlations were obtained for all subjects and for a subgroup with clinical elevations in the CBCL. Missing data points were not estimated.

RESULTS

Descriptive Data

Of 58 eligible, reachable referred children, 50 (86%) boys and girls participated and 8 (13.8%, mostly adoles-

cents) refused to participate. In addition, 14 potentially eligible children were unreachable, including several who had moved out of the area. No subjects met the exclusion criteria. For each measured study variable, 94% or more of the children had complete data, with the exception of the TRF, which was returned only by the teachers in two thirds of the cases ($n = 33$). Sociodemographics, immigration variables, IQ, psychopathology, and language data are summarized in Tables 1 and 2. Socioeconomic status (SES) was low for most households (68%), but with an average maternal education of 11 years. Most children (74%) were U.S.-born. All were the children of immigrant parents. "Other" countries of origin included Mexico, Peru, Guatemala, Costa Rica, Ecuador, Bolivia, and Argentina (one subject each).

Nonverbal IQ was in the low-average range. Six children (12.2%) scored below 70 (three with IQ = 69 and three with IQ = 57). Levels of emotional/behavioral problems were high (Table 2). The most common clinically significant problems were internalizing (social withdrawal, anxiety, and depression, 66%), externalizing (aggression and delinquency, 38%), problems with attention (36%), anxiety/depression (34%), followed by aggressiveness (32%) and social problems (30%).

Prevalence of Language Deficits and Disorders

Language deficits or delays were found in 46% of the children, and 41% met *DSM-IV* criteria for a language disorder (Fig. 1). Mixed receptive-expressive deficits ($\chi^2_1 = 9.78, p = .002$) were significantly more common than expressive deficits, accounting for 82.3% of the children with language deficits. Mixed receptive-expressive disorder, also significantly more common than other types, accounted for 79% of children with language disorders (Fig. 1). There were no cases of pure receptive language deficits that were unaccompanied by expressive deficits.

Inverse Correlation of Bilingual Language Skills and Emotional/Behavioral Problems

Simple correlations between bilingual language skills and 16 emotional/behavioral problem scores were obtained. Table 3 shows the result for the "clinical" subgroup, those with any CBCL score above the clinical cutoff ($n = 26$). In addition, Figure 2 also includes correlations for the total group ($n = 42$). The exploration of potential confounds showed nonverbal IQ as the only individual variable that significantly correlated with both bilingual language skills (Pearson $r = 0.39, p = .01, n = 44$) and

TABLE 1
Sociodemographics, Immigration, and Acculturation

	No.	%	Mean	SD
Sociodemographics				
Gender				
Male	32	64		
Female	18	36		
Age (years)				
5–7	18	36	9.4	3.7
8–11	16	32		
12–16	16	32		
Race				
White	23	46		
Black	2	4		
Mixed	25	50		
Household socioeconomic status				
Low	34	68		
Middle	16	32		
Maternal education				
1. Less than grade 7	16	33	3.4 ^a	2.1
2. Junior high (grade 9 completed)	3	6		
3. Partial high school (grade 10 or 11)	7	14		
4. High school graduate	7	14		
5. Partial college ^b or specialized training	8	16		
6. Standard college or university	3	6		
7. Graduate professional training ^c	5	10		
Immigration and acculturation variables				
Country or place of origin				
El Salvador	17	34		
Puerto Rico	9	18		
Dominican Republic	7	14		
Other	7	14		
Mixed	10	20		
Percent of lifetime resided in the U.S.				
Years of residence in the U.S.				
≥5	41	82	85	31
≥2	47	94		
Immigration depth				
Total				
1. Foreign-born child arrived after age 10	5	10	3.5 ^d	1.1
2. Foreign-born child arrived between ages 6 and 10	5	10		
3. Foreign-born child arrived before age 6	3	6		
4. U.S.-born child with both parents born abroad	36	72		
5. U.S.-born child with only one foreign-born parent	1	2		
Language use ^e				
Average language use				
Language used with siblings			2.9	0.9
Language used with friends			3.0	1.5
Language used with friends			2.1	1.3
Language used at school			1.9	1.1
Language used with adults at home			4.4	1.0
Language between adults at home			4.8	0.7

^a The average mother completed 11th grade but did not graduate from high school.

^b At least 1 year.

^c Graduate degree.

^d The average child was born in the U.S. or arrived before age 5 with both parents born abroad.

^e 1 = only English, 5 = only Spanish, 3 = balanced use.

TABLE 2
Nonverbal IQ, Psychopathology, and Language

	No.	%	Mean	SD
Nonverbal IQ (TONI-2)			89.9	14.2
Psychopathology				
In the borderline clinical range				
CBCL or TRF	39	81		
CBCL only	34	72		
In the clinical range				
CBCL or TRF	34	71		
CBCL only	29	62		
CBCL total score			61.7	11.8
CBCL broad-band scales ^a				
Internalizing	31	66	61.0	11.5
Externalizing	18	38	55.8	10.8
CBCL scales ^a				
Withdrawn	13	28	59.5	8.6
Somatic Complaints	9	19	59.1	8.0
Anxious/Depressed	16	34	62.0	10.7
Social Problems	14	30	59.6	9.9
Thought Problems	11	23	57.0	9.5
Attention Problems	17	36	61.3	10.2
Delinquent Behavior	10	21	57.5	9.1
Aggressive Behavior	15	32	62.1	11.9
TRF total score			55.4	11.6
Language (WLPB-R standard scores)				
English	47		70.4	21.09
Spanish	48		67.8	19.8

Note: TONI-2 = Test of Nonverbal Intelligence, second version; CBCL = Child Behavior Checklist; TRF = Teacher's Report Form; WLPB-R = Woodcock Language Proficiency Battery-Revised.

^a The percentages denote those in the clinical range.

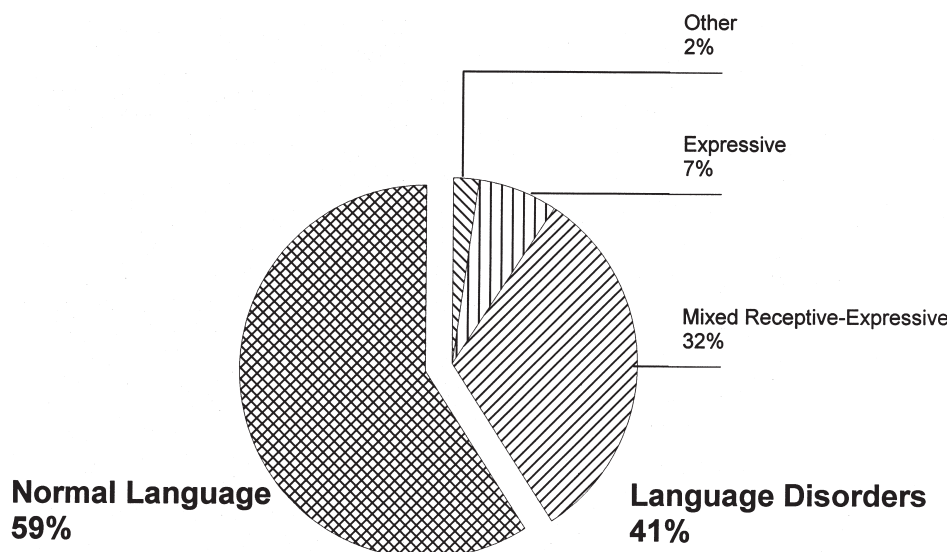


Fig. 1 Prevalence of language disorders in bilingual child and adolescent psychiatric referrals ($n = 44$). Mixed receptive-expressive language disorder is the most common type ($\chi^2_1 = 6.368, p = .012$).

TABLE 3
Simple Correlations Between Bilingual Language Skills
and Psychopathology Among 26 Children With
CBCL *T* Scores in the Clinical Range

	<i>R</i>	<i>p</i>
Global measures		
CBCL composite	−0.67	.0002**
CBCL total scores	−0.61	.001**
TRF composite	−0.58	.015*
TRF total scores	−0.64	.006**
Broad-band scales		
CBCL Internalizing (scales I, II, III)	−0.20	.323
CBCL Externalizing (scales VII, VIII)	−0.45	.020*
TRF Internalizing (scales I, II, III)	−0.42	.097
TRF Externalizing (scales VII, VIII)	−0.50	.039*
CBCL scales		
Withdrawn (scale I)	−0.29	.157
Somatic Complaints (scale II)	−0.32	.106
Anxious/Depressed (scale III)	−0.01	.957
Social Problems (scale IV)	−0.66	.0002**
Thought Problems (scale V)	−0.54	.004**
Attention Problems (scale VI)	−0.57	.002**
Delinquent Behavior (scale VII)	−0.66	.0002**
Aggressive Behavior (scale VIII)	−0.52	.006**

Note: Simple correlations for the children with CBCL scores in the clinical range (*T* scores ≥ 70 ; $n = 26$ $df = 24$, except for the TRF measures for which $n = 17$, $df = 15$). Statistical significance (*p* values) is two-tailed. CBCL = Child Behavior Checklist; TRF = Teacher's Report Form.

* $p \leq .05$; ** $p \leq .007$ and remains significant ($p < .05$) after Bonferroni ($\times 4$ for global, $\times 4$ for broad-band, and $\times 8$ for scale scores).

problem scores (with CBCL composite $r = -0.33$, $p = .025$, $n = 46$). The combination of potential confounding variables resulted in a significant canonical factor only when the control set (set 2) included IQ, immigration depth, and maternal education ($r = 0.55$, $\chi^2_6 = 13.70$, $p = .033$, while for the second factor, $r = 0.07$, $\chi^2_2 = 0.18$, $p = .91$). Because more than 95% of this factor's variability was explained by IQ and, consequently, the comparison of partial correlations controlling for the canonical factor versus those controlling for IQ showed minimal *r* differences (in the order of the third decimal), of all controlled analyses we present here only the correlations controlling for IQ (see below). Overall, controlling for IQ made the size of the correlations (*r* value) decrease by 20% in the total group and by 4% in the clinical subgroup. Other hypothetical confounds such as age, gender, proportion of lifetime resided in the United States, and language use did not affect the correlations significantly and, therefore, resulted in nonsignificant factors.

Simple and IQ-controlled correlations between bilingual language skills and emotional/behavioral problems

for the clinical subgroup and the total group were obtained. For the clinical subgroup, the correlations were higher—explaining up to 45% of the variance—and significant, with the exception of the Internalizing scales and their components (Table 3); they remained significant after control for IQ.

For the total group, 7 of 16 simple correlations were significant, including with the CBCL composite ($r = -0.41$, $p = .007$), the Social Problems scale ($r = -0.43$, $p = .004$), and the Thought Problems scale ($r = -0.46$, $p = .002$). After we controlled for IQ, three remained significant.

DISCUSSION

This study of bilingual children referred for child and adolescent psychiatry services strongly suggests that language disorders and deficits in bilingual language skills are closely tied to psychopathology. Children whose parents and teachers report heightened behavioral and emotional problems have in general limited bilingual skills. This appears to be particularly true for children whose problems reach clinical magnitude, in which their bilingual language skills are closely and inversely associated with severity of delinquency, social, attentional, thought, and aggressiveness problems. The fact that the associations are much stronger for children above a clinical threshold makes a compelling argument for this threshold indexing the presence of risk factors or vulnerabilities or the absence of protective factors, so that either language or psychopathology liabilities are not buffered, making possible their close mapping to each other. This study also strongly suggests a high prevalence of language deficits and disorders of between 40% and 50%, comparable with studies of monolingual children referred to psychiatry services (Cantwell and Baker, 1991; Cohen et al., 1993). Cohen's study is also comparable with ours in subjects' sociodemographics (consecutively referred to urban mental health centers; similar distribution of gender and two-parent households, average maternal education, and average nonverbal IQ), emotional/behavioral-problem ascertainment methods, and measures. In contrast, however, our study used a more restrictive deficit and disorder definitions with a 15-point IQ-discrepancy criterion, whereas Cohen's took a less conservative approach, which could explain our somewhat lower percentages. This is the first bilingual study to replicate three main findings from monolingual research, namely (1) that language skills are particularly affected in children with social,

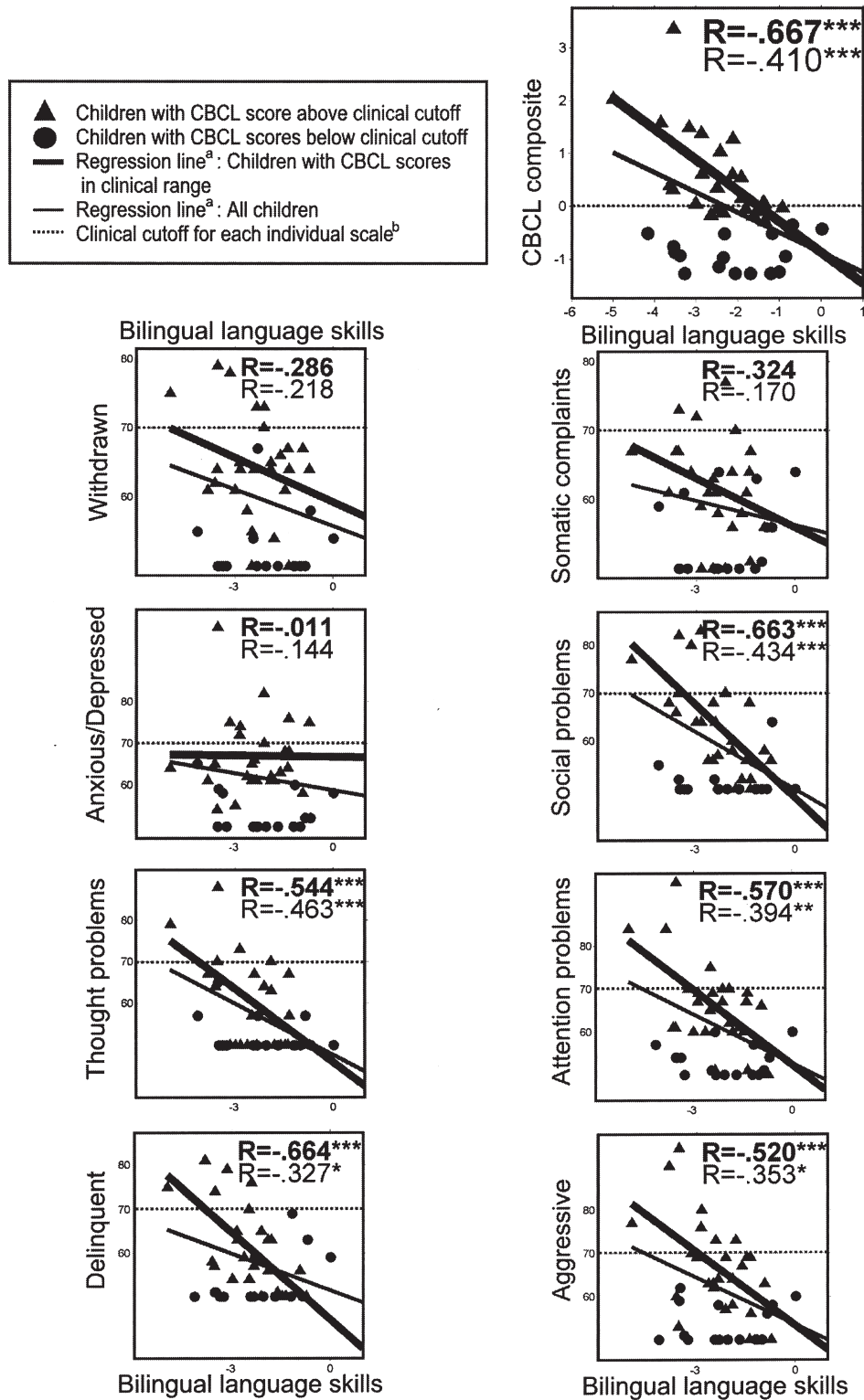


Fig. 2 Scatterplots of bilingual language skills and problem scores (CBCL composite and eight problem scales). ^aPearson *R* coefficients are shown for the clinical subgroup (top *R* in boldface type) and for all children (bottom *R* in regular type). ^b*T* score = 70. **p* ≤ .05; ***p* ≤ .01; ****p* ≤ .007 and remains significant (*p* < .05) after Bonferroni (×4 for global, ×4 for broad-band, and ×8 for scale scores). CBCL = Child Behavior Checklist.

attentional, and externalizing problems; (2) that mixed receptive-expressive disorder is the most common type; and (3) that the pure receptive language disorder type is rarely if ever found. Overall, linguistic functioning in these children is of concern, if one considers the generally low level of English, Spanish, and bilingual skills in contrast to the reported balanced language use, i.e., their actual daily communicative needs.

Despite the correlational nature of this research, a discussion about possible mechanisms, although speculative, may be useful to guide future research directions. What models can plausibly explain these findings? Modifying prior concepts from Cantwell and Baker (1991) and Beitchman et al. (1996a), we found at least three possible models to explain the findings: in model 1, psychopathology predicts (causes or predisposes to) poor language skills; in model 2, language skills inversely predict (good language skills prevent while poor language skills cause or predispose to) psychopathology; and in model 3, a third factor (or factors) independently predicts (causes or prevents) both psychopathology and poor language skills. The strong inverse associations of bilingual skills with thought problems, attentional deficits, delinquency, and aggressiveness point at the relevance of bilingual skills in children suffering from disorganizing and psychotic processes, ADHD, conduct disorder, and oppositional defiant disorder. As illustrated by Figure 2, clinical psychopathology and proficient bilingualism (i.e., bilingual skills scores higher than 1 SD below the mean) were almost never found together and may preclude each other. Based on our sample, we could speculate that proficient bilingualism prevents the emergence of psychopathology (model 2) or that clinical psychopathology makes full bilingual language acquisition impossible (model 1). Parallel to past research in monolingual children, insufficient (bilingual) language skills are associated with externalizing behavioral problems and may predict aggressive and antisocial outcomes. In contrast to monolingual research, however, bilingual skills did not generally associate with internalizing problems, which may imply differences in the nature of the relationship of psychopathology with monolingual versus bilingual language acquisition; this issue merits further research. The very strong inverse association between bilingual language skills and Social Problems (a scale not associated with a particular *DSM* diagnosis but rather a global measure of social malfunctioning) firmly suggests an impact of social maladjustment on bilingual outcome (model 1) or, alternatively, that failed bilin-

gualism may result in growing isolation, asociality, and maladjustment (model 2). Finally, language deficits could be the common underlying factor leading to both psychopathology and low bilingual language skills (model 3).

Any model should take into account the role of nonverbal cognitive processes. Nonverbal IQ may be part of the causal pathway linking low bilingual skills and psychopathology and therefore may not be an actual confounder, but rather a mediator variable (Baron and Kenny, 1986). To be considered a confounder, a variable cannot be a part of a causal pathway linking the variables of interest (Rothman, 1986). The development of nonverbal cognitive skills is tied to and, some researchers have argued, fostered by bilingualism (Diaz, 1985). A separate body of research considers IQ/cognitive skills as protective against psychopathology. IQ appears to be a true mediating factor and part of the mechanism of the relationship between bilingual skills and psychopathology. For instance (model 2), if bilingual skills protect against psychopathology, this protectiveness may be mediated by nonverbal skills. In children for whom second-language immersion is overly stressful because of limited language skills, strong nonverbal skills may make navigating a threatening and otherwise unmanageable environment easier, preventing the emergence of psychiatric symptoms. Conversely, if psychopathology impeded the simultaneous development of two languages (model 1), cognitive deficits associated with psychopathology may be key in hindering bilingual development. Other variables, such as immigration depth, residence in the United States, language use, and age, did not appear to be confounds, which may indicate the strong specificity of the language-psychological association.

Limitations

Although several control variables were studied, other factors may be responsible for the findings. Lacking a control group, it is unclear whether the high language disorder prevalence characterizes minority or low SES, rather than psychiatric referral status; low SES groups have high psychiatric and language disorder prevalence (Toppelberg and Shapiro, 2000). The lack of effect of acculturation, immigration, and socioeconomic variables begs replication and comparison, as it may be specific to our relatively homogeneous sample. Although age did not show a confounding effect, psychopathology and language profiles may differ along the wide age range of our sample. The potential moderating effect of age needs to

be addressed in future reports. The CBCL and TRF, although widely used, are not equivalent to a full diagnostic assessment, and some children with clinical elevations may not meet diagnostic criteria for a mental disorder. The same can be said about our operationalized language protocol. A small sample size makes the conclusions more tentative, particularly as the composites resulting from principal components analysis are likely to change in a different sample. Low language skills in both languages could arguably be a stage in normal bilingual acquisition, although the magnitude of the findings and the length of exposure to both languages seem to deny this possibility; however, longitudinal follow-up and comparison with a normal group would be required to rule out this explanation. The inverse bilingual language skills–psychopathology association needs replication to further a threshold hypothesis. Moreover, we do not know whether these associations would be found in the general bilingual child population. A population-based study looking at the association of bilingual language skills and psychopathology with more complete language, psychiatric, and sociodemographic assessments would be needed to establish a true association. Finally, “correlation is not causation”: correlational research cannot establish causality or its directionality. Comparison, longitudinal, and experimental research with larger samples will be needed to clarify these issues.

Clinical and Research Implications

The clinical and research implications are several and important. This study supports the feasibility of conducting much-needed child mental health studies in language-minority and immigrant populations. Language disorders may need to be suspected more often in bilingual children referred for psychiatric services, particularly when ADHD and externalizing disorders are considered, without assuming that the language difficulties are solely the result of normal bilingual acquisition. This is the first time a study has suggested a high prevalence of language disorders in bilingual children referred for psychiatric services. In fact, delayed bilingual development is likely to be present in children with clinical psychopathology. Our correlational results justify incremental suspicion of language delays or disorders as psychiatric symptoms increase. For optimal clinical practice, a close association between child and adolescent psychiatry and speech/language services is as important for this population as it is for monolingual children. Indirectly, this study has also demonstrated the utility and efficiency of standardized English- and

Spanish-language tests. Bilingual language assessment is, therefore, feasible and needs to become common practice in identifying children in need of services.

REFERENCES

- Achenbach TM, Edelbrock C (1991), *Manual for the Child Behavior Checklist/4–18 and 1991 Profile*. Burlington: University of Vermont Department of Psychiatry
- American Psychiatric Association (1994), *Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV)*. Washington, DC: American Psychiatric Association
- Baron RM, Kenny DA (1986), The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J Pers Soc Psychol* 51:1173–1182
- Beitchman JH, Cohen NJ, Konstantareas MM, Tannock R, eds (1996a), *Language, Learning, and Behavior Disorders: Developmental, Biological, and Clinical Perspectives*. New York: Cambridge University Press
- Beitchman JH, Wilson B, Brownlie EB et al. (1996b), Long-term consistency in speech/language profiles, II: behavioral, emotional, and social outcomes. *J Am Acad Child Adolesc Psychiatry* 35:815–825
- Bird HR (1996), Epidemiology of childhood disorders in a cross-cultural context. *J Child Psychol Psychiatry* 37:35–49
- Brown L, Sherbenou RJ, Johnsen SK (1990), *TONI-2. Test of Nonverbal Intelligence: Examiner's Manual*, 1st ed. Austin, TX: Pro-ed
- Cantwell DP, Baker L (1991), *Psychiatric and Developmental Disorders in Children With Communication Disorders*. Washington, DC: American Psychiatric Press
- Cohen NJ, Davine M, Horodezky N, Lipsett L, Isaacson L (1993), Unsuspected language impairment in psychiatrically disturbed children: prevalence and language and behavioral characteristics. *J Am Acad Child Adolesc Psychiatry* 32:595–603 [published erratum appears in *J Am Acad Child Adolesc Psychiatry* 1993;32:1103]
- Cohen NJ, Horodezky NB (1998), Language impairments and psychopathology. *J Am Acad Child Adolesc Psychiatry* 37:461–462
- Craig HK (1993), Social skills of children with specific language impairment: peer relationships. *Lang Speech Hear Serv Sch* 24:206–215
- Crijnen AAM, Achenbach, TM, Verhulst FC (1997), Comparisons of problems reported by parents of children in 12 cultures: total problems, externalizing, and internalizing. *J Am Acad Child Adolesc Psychiatry* 36:1269–1277
- Dale PS (1996), Language and emotion: a development perspective. In: *Language, Learning, and Behavior Disorders: Developmental, Biological, and Clinical Perspectives*, Beitchman JH, Cohen NJ, Konstantareas MM, Tannock R, eds. New York: Cambridge University Press, pp 5–22
- Diaz R (1985), The intellectual power of bilingualism. *Q Newsl Lab Comp Hum Cogn* 7:15–22
- Farmer M (1997), Exploring the links between communication skills and social competence. *Educ Child Psychol* 14:38–44
- Giddan JJ, Milling L, Campbell NB (1996), Unrecognized language and speech deficits in preadolescent psychiatric inpatients. *Am J Orthopsychiatry* 66:85–92
- Hakuta K (1986), *Mirror of Language: The Debate on Bilingualism*. New York: Basic Books
- Hakuta K, D'Andrea D (1992), Some properties of bilingual maintenance and loss in Mexican background high-school students. *Appl Linguistics* 13:72–99
- Hinshaw SP (1992), Externalizing behavior problems and academic underachievement in childhood and adolescence: causal relationships and underlying mechanisms. *Psychol Bull* 111:127–155
- Hollingshead A (1975), *Four Factor Index of Social Status*. New Haven, CT: Yale University Department of Sociology
- Leonard L (1998), *Children With Specific Language Impairment*. Cambridge, MA: MIT Press
- Mazure CM ed. (1995), *Does Stress Cause Psychiatric Illness?* Washington, DC: American Psychiatric Press
- Paul R, Kellogg L (1997), Temperament in late talkers. *J Child Psychol Psychiatry* 38:803–811

- Rice ML, Sell MA, Hadley PA (1991), Social interactions of speech- and language-impaired children. *J Speech Hear Res* 34:1299–1307
- Rothman KJ (1986), *Modern Epidemiology*. Boston: Little, Brown
- Suarez-Orozco C, Suarez-Orozco MM (2001), *Children of Immigration*. Cambridge, MA: Harvard University Press
- Tabors PO (1997), *One Child, Two Languages: A Guide for Preschool Educators of Children Learning English as a Second Language*. Baltimore: Brookes
- Tomblin JB, Records NL, Zhang X (1996), A system for the diagnosis of specific language impairment in kindergarten children. *J Speech Hear Res* 39:1284–1294
- Toppelberg CO, Shapiro T (2000), Language disorders: a 10-year research update review. *J Am Acad Child Adolesc Psychiatry* 39:143–152
- US Census Bureau (1990), Table 2. Language Use and English Ability, Persons 5 to 17 Years, by State: 1990 Census (<http://www.census.gov/population/socdemo/language/table2.txt>; accessed in December 1999)
- Wong Fillmore L (1979), Individual differences in second language acquisition. In: *Individual Differences in Language Ability and Language Behavior*, Fillmore C, Kempler D, Wang W, eds. New York: Academic Press
- Woodcock RW (1991), *Woodcock Language Proficiency Battery-Revised, English and Spanish Forms: Examiner's Manual*, 1st ed. Chicago: Riverside Publishing Company