Primary Care and Workforce Issues

Parents' Perceptions of Pediatric Primary Care Quality: Effects of Race/Ethnicity, Language, and Access

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Objective. To examine the effects of race/ethnicity, language, and potential access on parents' reports of pediatric primary care experiences.

Data Sources/Study Setting. Primary survey data were collected (67 percent response rate) from 3,406 parents of students in kindergarten through sixth grade in a large urban school district in California during the 1999–2000 school year.

Data Collection. The data were collected by mail, telephone, and in person. Surveys were administered in English, Spanish, Vietnamese, and Tagalog.

Study Design. Data were analyzed using multiple regression models. The dependent variable was parents' reports of primary care quality, assessed via the previously validated Parents' Perceptions of Primary Care measure (P3C). The independent variables were race/ethnicity, language, and potential access to care (insurance status, presence of a regular provider of care), controlling for child age, gender, and chronic health condition status, and mother's education.

Principal Findings. Parents' reports of primary care quality varied according to race/ethnicity, with Asian and Latino parents reporting lower P3C scores than African Americans and whites. In multivariate analyses, both language and potential access exerted strong independent effects on primary care quality, reducing the effect of race/ethnicity such that the coefficient for Latinos was no longer significant, and the coefficient for Asians was much smaller, though still statistically significant.

Conclusions. To reduce racial/ethnic disparities in primary care, attention should be paid both to policies aimed at improving potential access and to providing linguistically appropriate services.

Key Words. Health care quality, children, primary care, race and ethnicity, health disparities

High-quality primary care is a cornerstone of efforts to improve health outcomes, control health care spending, and reduce health care disparities (Starfield and Simpson 1993; Starfield 1996, 1998). However, recent work (Collins et al. 2002; Schneider, Zaslavsky, and Epstein 2002; Institute of Medicine Committee on Understanding and Eliminating Racial and Ethnic

Disparities in Health Care 2003) has continued to underscore disparities across racial/ethnic groups in primary care quality.

While these disparities have been shown to exist across groups of both adults and children, continued and expanded focus on the primary care experiences of children is important (Forrest, Simpson, and Clancy 1997; McGlynn and Halfon 1998; Wehr 2001). Children, relative to adults, are disproportionately poor and of color, highlighting the importance of understanding the relationships between socioeconomic status (SES) and race/ethnicity and health (Gould, Davey, and LeRoy 1989; Feinstein 1993; Pappas et al. 1993; Pappas et al. 1997). Children are more likely to be uninsured (Holahan et al. 2000) and to be covered by public health insurance programs, emphasizing the relevance of such findings to public health policymakers. Children's physical, social, emotional, and behavioral development impacts their overall health, and they develop rapidly, underscoring the importance of longitudinal, comprehensive primary care. Children's health care needs are mostly in the realm of preventive and acute care, hallmarks of primary care. And children are dependent on families and other institutions for access to care.

While much of the research on disparities in primary care focuses on adults, several studies (Weech-Maldonado et al. 2001; Stevens and Shi in press) have described similar disparities for children. Stevens (in press), in a recent comprehensive review of the extant literature, concludes that racial and ethnic disparities in pediatric primary care quality exist and persist even after controlling for socioeconomic status and health system characteristics.

However, limitations exist in the research literature. First, empirical investigation is needed to disentangle the effects of language, race/ethnicity, and potential access on primary care quality (Fiscella et al. 2002). Disentangling the effects of race/ethnicity and language is especially important in light of the fact that a recent report by the Commonwealth Fund (Collins et al. 2002) found that 53 percent of Latino and 79 percent of

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Asian/Pacific Islander adults were born outside of the United States. In the Commonwealth Fund report, and in pediatric samples (Weech-Maldonado et al. 2001), patient/parent English language proficiency was related to primary care quality. Limited English proficiency has also been shown to be related to reduced use of physician services (Derosé and Baker 2000), to negatively impact the patient–physician encounter (Baker, Hayes, and Fortier 1998; Rivadeneyra et al. 2000), and to affect process measures in pediatric emergency department visits (Hampers et al. 1999). A recent review by Flores and colleagues (Flores et al. 2002) highlights unanswered questions regarding disparities in care experienced by Latino children, including the relative role of linguistic barriers to care.

Another factor to be disentangled is potential access to care. Potential access variables, according to Andersen and Davidson, are “structural indicators such as characteristics of the health care delivery system and enabling resources that influence potential care seekers’ use of health services” (p.17) (Andersen and Davidson 1996). These are variables such as having health insurance (Aday et al. 1993; Kaiser Family Foundation 1995; Newacheck, Hughes, and Stoddard 1996; Burstin et al. 1998; Newacheck et al. 1998; Weissman et al. 1999) or having a regular care provider (Kasper 1987; Short and Lefkowitz 1992; Kempe et al. 2000) that make it more likely that care will be used, but that are distinct from actual use of care or the characteristics of that care. While much research exists on disparities in primary care access and use, and while potential access is seen as a necessary condition for primary care quality, less is known about how potential access, race/ethnicity, and language codetermine primary care quality for children.

A second limitation of the existing literature is in the measurement of primary care quality for children. The Institute of Medicine (IOM) has defined primary care as “the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community” (Institute of Medicine 1996). Operational definitions of these concepts vary across researchers. Nevertheless, there is general agreement that primary care is accessible, longitudinally continuous, adequately communicated, contextual (based on a provider’s accumulated knowledge of the patient and family), comprehensive, and coordinated (Flocke 1997; Safran et al. 1998; Starfield 1998).

Further, there is emerging recognition of the distinction between patient/parent *reports* of experiences with the health care delivery system and *ratings* of satisfaction with health care delivery (Flocke 1997; Starfield 1998).

Satisfaction ratings are evaluated against the respondent's expectations, which vary widely across individuals and ultimately do not suggest ways in which the health system can be improved (Starfield 1998). On the other hand, reports of experiences are evaluated against a specific prescriptive criterion (for example, that care be "adequately communicated" [Bindman et al. 1996]). As such, deviations from the criterion represent potential decrements in quality and areas for improvement.

The current study was designed to address some of the shortcomings in the existing literature. First, borrowing from Andersen and Aday's Behavioral Model of Health Services Use (Aday and Andersen 1974; Andersen and Aday 1978), we distinguish between predisposing factors such as race/ethnicity, and enabling factors such as potential access (insurance, regular source of care) and language ability in examining disparities in pediatric primary care. If enabling factors account for some part of the effect of race/ethnicity on pediatric primary care quality, this would suggest ways to reduce the disparities noted above. Second, we use a conceptually and methodologically sound measure to operationalize the outcome variable, pediatric primary care quality. As described below, the Parent's Perceptions of Primary Care measure (P3C) assesses parents' reports of those aspects of primary care that, when present, constitute high-quality care by the IOM's definition. As such, this measure can serve as a useful indicator of pediatric primary care quality.

We hypothesize that race/ethnicity, language, and potential access have independent effects on parents' perceptions of primary care quality. Further, we hypothesize that both language and potential access account for much of the previously reported relationship between race/ethnicity and parents' perceptions of primary care quality.

METHODS

This study consisted of a cross-sectional survey of parents of elementary school students. The surveys were administered to parents of children in 228 classes, from kindergarten through the sixth grade, at 18 elementary schools within a large urban school district. Schools were selected for inclusion in the study based on the presence of three target languages (Spanish, Vietnamese, and Tagalog) and heterogeneity of socioeconomic status, as measured by the percent of the student body eligible for federal free or reduced-priced lunch. Classes at schools were randomly selected within grade. Classes in which the consent rate was below 50 percent were dropped before analysis and replaced with other randomly selected classes from the same school.

Measures

Independent variables were race/ethnicity, parental language ability, and potential access. The dependent variable was parents' reports of primary care quality. Control variables included socioeconomic status, child chronic health condition status, gender, and age.

Race/Ethnicity. Children's race/ethnicity was reported by parents to the school district and linked to survey data by means of the child's student identification number. Dummy variables were created, comparing Asian/Pacific Islander (API; combining Filipino, Vietnamese, and other Asian), Latino, and African American students to white students. Because of the small number of Native Americans in the sample ($n = 12$), this group was excluded from analyses.

Language. Parents completed the surveys in the language with which they were most comfortable—English, Spanish, Vietnamese, and Tagalog—and this language preference was used as a proxy for parental English-language ability. This variable was recoded into a dichotomous categorical variable representing English versus non-English language survey.

Socioeconomic Status. Socioeconomic status (SES) is a complex construct and can be measured using many different variables (Committee on Pediatric Research 2000). Mother's education was used as the measure of SES because it may be the most appropriate measure when examining quality of primary care, as more educated mothers may be able to access care, communicate, and assert their child's needs more effectively (Heck and Parker 2002). Parents were asked to report mothers' highest level of education, with the response scale being sixth grade or less, seventh through ninth grade, tenth to twelfth grade, high school diploma, some college, college degree, and graduate or professional degree. These education levels were grouped into three analytic categories: less than a complete high school education, high school graduate or some college, and college graduate and beyond.

Chronic Health Condition Status. Parents were asked to report on whether their child had a chronic health condition using the following definition: "A chronic health condition is: (1) a physical or mental health condition (2) that has lasted or is expected to last at least 6 months and (3) interferes with your child's activities." Parents were instructed to respond with "yes" or "no" to the question "In the past 6 months, has your child had a chronic health condition?" Parents were also asked to identify the name of the chronic health condition. Parents who answered yes or who gave the name of a chronic health condition were coded as having a child with a chronic health

condition. This methodology for identifying pediatric chronic health conditions has been previously validated (Varni, Seid, and Kurtin 2001).

Potential Access. To assess whether children had a regular source of care, parents were asked "Do you have one person you think of as your child's personal doctor or nurse?" (Agency for Healthcare Research and Quality 1998). To assess insurance status, parents were asked whether their child currently had health insurance, and, if so, what kind. Dummy variables were created to compare no insurance, Medicaid/SCHIP (Child Health Insurance Program), and other (including military insurance such as CHAMPUS and TriCare), to commercial (private) insurance.

Parent's Perceptions of Primary Care (P3C). Parents' perceptions of primary care quality was measured via the Parent's Perceptions of Primary Care measure (P3C), a brief, practical, reliable, and valid parent report of their experiences with their children's primary care (Seid et al. 2001). The P3C is based on the Institute of Medicine definition of primary care. Using this definition as a criterion, the P3C was designed to measure six components of care which, when present, constitute high-quality primary care. High scores reflect care conforming to this a priori definition. Thus, the P3C measures perceptions of quality based on parent *reports* of their experiences, rather than ratings of satisfaction with those experiences. The P3C was designed to measure parents' perceptions of the quality of primary care received, rather than the quality of a particular provider of primary care. This was done so that the care received by children without a regular provider could also be described in relation to the IOM definition of quality primary care. This is important, given the high rate of uninsured children (U.S. Department of Commerce 1998) and children without a regular source of care (Wood et al. 1990; Halfon et al. 1996), or those who receive primary health care at emergency rooms or community clinics where they might not see a consistent provider.

The components of primary care included in the P3C are those on which parents are thought able to report. The six components of primary care measured by the P3C are defined as follows. *Longitudinal continuity* is defined as the parent's report of the length of time they have been bringing their children to a regular place or physician (Starfield 1998; Bindman et al. 1996). *Access* is defined as the parent's report of timely and convenient access to care for their children (Bindman et al. 1996). *Communication* is defined as the parent's report of how well the physician listens and explains during their interactions (Flocke 1997). *Contextual knowledge* is defined as the parent's report that the physician knows his or her values and preferences about

medical care issues, clearly understands his or her child's health needs, and knows the child's medical history (Starfield 1998). *Comprehensiveness* is defined as the parent's report of the extent to which a regular place or doctor provides care for acute and chronic problems and preventive services (Bindman et al. 1996; Flocke 1997). *Coordination of care* is defined as the parent's report of their physician's knowledge of other visits and visits to specialists, as well as the follow-up of problems through subsequent visits or phone calls (Starfield 1998).

The P3C was developed to be used by multiple stakeholders to assess parents' perceptions of primary care quality for groups of children. As such, it is designed to be used to monitor population health services, to assess health plan quality, to drive performance improvement initiatives, or to evaluate the efficacy or effectiveness of interventions designed to improve primary care quality.

The 23-item P3C yields scores on a 0–100 scale for the Total Scale, as well as for subscales measuring continuity, access, contextual knowledge, communication, comprehensiveness, and coordination. The P3C does not specify a recall period, to make it easier to respond for parents of children who have changed primary care providers or locations. All items are at or below an eighth grade reading level. See the Appendix for P3C items.

The P3C was developed in English and translated to Spanish, Vietnamese, and Tagalog. Translation was accomplished using forward-backward translation striving for conceptual, as opposed to syntactical equivalence and consistent language level (Hendricson et al. 1989; Canales, Ganz, and Coscarelli 1995; Ware et al. 1995; Herdman, Fox-Rushby, and Badia 1997; Keller et al. 1998). The final English-language and translated versions of the P3C were reconciled by bilingual lay people familiar with the purpose of the survey.

The P3C has been shown to be feasible, reliable (high internal consistency), and valid (Seid et al. 2001). Feasibility was documented by demonstrating a low percentage of missing values overall, for parents completing the P3C in a language other than English, and for parents without a high school diploma. Internal consistency (Chronbach's coefficient alpha) of the P3C total scale and subscales has been documented as acceptable for group comparisons for all languages combined. Additional analyses demonstrate that internal consistency is acceptable, as well, for each of the four different languages used in the present study (see Table 1). Validity was previously demonstrated via the known-groups method, by showing that P3C scores were higher for children with health insurance versus those without,

Table 1: Internal Consistency Reliabilities (Alpha) for P3C Total Scale and Subscales, by Language

<i>Scale</i>	<i>English</i>	<i>Spanish</i>	<i>Vietnamese</i>	<i>Tagalog</i>
Total	0.95	0.95	0.90	0.95
Continuity	0.73	0.77	0.72	0.50
Access	0.80	0.78	0.59	0.86
Accumulated Knowledge	0.92	0.91	0.89	0.91
Communication	0.93	0.93	0.89	0.81
Comprehensiveness	0.87	0.86	0.81	0.89
Coordination	0.89	0.89	0.87	0.92

with a regular physician versus those without, and whose parents completed the P3C in English versus another language. Validity was further documented by demonstrating that the P3C is related to health-related quality of life as measured by the Pediatric Quality of Life Inventory™ (PedsQL™; Varni, Seid and Kurtin 2001).

Procedures

Project staff visited each classroom and distributed the questionnaires for students to take home to their parents. Parents signed the informed consent and completed the surveys at home, and returned them to school via the students. At several schools, sessions were held for parents with limited literacy. In these cases, bilingual staff were available to administer the survey to the parents. Phone calls were made to collect missing data.

This protocol was reviewed and approved by the institutional review board at Children's Hospital and Health Center, San Diego.

Analysis

Non-English surveys, grade, gender, mother's education, chronic health condition, insurance status, and presence of a regular source of care were computed for each race/ethnic group. The significance of these differences (using white as the reference group) was assessed using chi-square tests of association. The unadjusted means for the P3C total and subscale scores were computed for each race/ethnic group and compared to whites, using one-way ANOVAs.

Bivariate relationships between these variables and parents' perceptions of primary care quality were examined using independent-sample t-tests and one-way ANOVAs. A set of regression analyses was used to examine the

multivariate relationships between race/ethnicity, language, potential access, and parents' perceptions of primary care quality. Four regression models were incrementally constructed, first including only (1) dummy variables for race/ethnicity (using white as the race/ethnicity reference group). Additional models controlled for (2) language, mother's education, and chronic health condition status, (3) potential access, and (4) all study covariates. Regression coefficients and their respective p-values are reported for race/ethnicity categories and study covariates. The coefficient of determination (both R^2 and adjusted R^2) was reported for each model to describe the amount of variance in total primary care experience that was explained by the study variables.

Finally, we compared primary care subdomain and total scores across race-language groups (further subdividing Asians and Latinos into those completing the survey in English versus other languages) using Generalized Linear Model (GLM) procedures, adjusting for the study covariates, and using Bonferroni adjustments to account for multiple comparisons.

RESULTS

The overall response rate for the survey was 67 percent. A total of 3,406 respondents (77.1 percent mother, 16.9 percent father, 2.8 percent grandparent, 2.4 percent guardian or other) completed the surveys. The sample was equally split between boys and girls and diverse with respect to race/ethnicity (37.9 percent Latino, 34.3 percent Asian/Pacific Islander, 14.1 percent white, 13.4 percent African American, and 0.4 percent Native American). For the sample as a whole, 64.4 percent of surveys were completed in English, with 27.7 percent completed in Spanish, 4.2 percent in Vietnamese, and 3.6 percent in Tagalog. One third (33.6 percent) of mothers had less than a high school education, 44.2 percent were high school graduates or had some college, and 22.2 percent were college graduates or beyond. Almost one in ten of the sample (9.3 percent) reported a chronic health condition.

Table 2 displays these variables by race/ethnicity. As can be seen, mother's education, chronic health condition status, insurance type, and the presence of a regular provider of care varied across race/ethnicity. Table 2 also shows the unadjusted mean differences across race/ethnicity for the P3C total score. Asians and Latinos reported lower P3C scores than African Americans and whites.

Table 3 shows the bivariate relationships between the variables of interest and parents' perceptions of primary care quality, as represented by P3C total scale scores. As can be seen, all relationships except for gender and

Table 2: Demographic Characteristics, Chronic Health Condition Status, and Potential Access by Race and Ethnicity (*N* = 3,390)

<i>Variables</i>	<i>Asian/Pacific Islander N = 1,158</i>	<i>African American N = 458</i>	<i>Latino N = 1,292</i>	<i>White N = 479</i>
Demographics				
Non-English language	22.7%****	0.4%*	72.4%****	2.3%
Female gender	47.7%	55.7%	48.2%	51.4%
Grade K-3 (vs. 4-6)	51.9%	53.5%	56.4%**	48.2%
Maternal education				
Less than high school	19.4%****	21.0%****	65.3%****	9.0%
High school or some college	42.4%****	61.6%****	29.3%****	62.6%
College grad or beyond	38.3%****	17.5%****	5.4%****	28.4%
Chronic condition (vs. no)	6.0%****	13.3%	7.6%****	17.5%
Potential Access				
Regular Provider (vs. no)	65.4%****	75.7%	44.8%****	79.5%
Insurance Type				
Commercial insurance	51.0%****	40.0%****	18.2%****	65.4%
Medicaid	17.4%****	37.6%****	30.6%****	10.9%
SCHIP	4.2%****	1.8%****	5.6%****	2.1%
Other (including CHAMPUS)	20.3%****	13.3%****	8.8%****	14.9%
Uninsured	7.3%****	7.3%****	36.8%****	6.7%
Primary Care Quality				
P3C total score, mean (sd)	61.9 (23.7)****	69.4 (23.4)	57.1 (25.8)****	68.4 (22.1)

P* < .05, *P* < .01, ****P* < .001, *****P* < .0001 for the difference in mean racial/ethnic minority group score compared to white. *Note:* SCHIP = State Child Health Insurance Program.

grade level are significant. Accordingly, gender and grade level were dropped from further analyses.

Table 4 shows the results of the linear regression analyses. Using only race as a predictor, the regression equation accounts for 3.5 percent of the variance in P3C total scores. Latinos and Asians report lower P3C scores than whites, with African Americans no different from whites in their reports. When sociodemographic factors (language, mother's education, chronic health condition status) are also included in the equation, 6.7 percent of the variance is accounted for. The coefficients for Asian and Latino race/ethnicity are lower than when those variables alone are included, and language emerges as a strong predictor. The coefficient for Latino ethnicity decreased substantially (by about nine points) and was no longer statistically significant, once the vulnerability variables were added. As well, mothers who did not complete high school report lower scores than those with a college degree or beyond. Chronic health condition status had no effect in this multivariate

Table 3: Bivariate Relationships between Covariates and Parent's Perceptions of Primary Care (P3C) Total Scale Scores

	<i>Test of Significance</i>	<i>P3C Total Mean (SD)</i>
Language	$t(3369) = 14.63, p < 0.0001$	
English		66.54 (23.39)
Other		53.92 (24.96)
Gender	$t(3051) = 0.07, ns$	
Male		62.67 (24.86)
Female		62.61 (24.71)
Grade	$t(3369) = 0.32, ns$	
K-3		62.20 (24.50)
4-6		61.93 (24.94)
Chronic Health Condition	$t(3369) = 3.15, p = 0.002$	
Yes		66.24 (22.76)
No		61.64 (24.85)
Mother's Education	$F(2, 3226) = 52.63, p < 0.0001$	
Less than high school		56.28 (24.40)
High school/some college		66.09 (23.90)
College grad or beyond		64.06 (24.69)
Insurance Status	$F(4, 3274) = 56.47, p < 0.0001$	
Commercial		67.48 (23.73)
Medicaid		62.18 (23.63)
SCHIP		59.02 (25.95)
Other		63.84 (23.33)
Uninsured		49.55 (24.80)
Regular Provider	$t(3354) = 18.79, p < 0.0001$	
Yes		68.10 (23.07)
No		52.44 (24.12)

Note: High scores indicate better quality primary care on a 0-100 scale. ns = nonsignificant.

analysis. Using race/ethnicity and potential access as predictors, the regression equation predicts 12.1 percent of the variance in P3C total scores. Race/ethnicity coefficients are lower again, and both a regular provider and insurance status have significant coefficients. Using the full model (adding both sociodemographics and potential access to race/ethnicity), the total variance accounted for is 13.3 percent. The coefficient for Latino is no longer significant, and that for Asian is significant, but only at $p < 0.05$ (associated with, on average, a 2.7 point difference in P3C scores). The coefficients for mother's education and for chronic health condition are not significant. Language, regular provider, and insurance status emerge as very strong predictors of P3C scores. Parents who completed the survey in English score, on average, 7 points higher than those in another language. Having a regular provider is associated with approximately an 11-point increase in P3C scores.

Table 4: Multiple Regression Models Predicting the Relationship between Race, Ethnicity, and Total Primary Care Experience, Incrementally Adjusted for Personal Factors and Potential Access

Variable	Model 1 (Race only)			Model 2 (Race and Personal Factors)			Model 3 (Race and Potential Access)			Model 4 (Race and All Covariates)		
	B	SE		B	SE		B	SE		B	SE	
Race and Ethnicity												
Asian	-6.44****	1.32		-3.69**	1.33		-4.32***	1.27		-2.71*	.129	
African American	0.94	1.59		1.21	1.57		2.43	1.55		1.93	1.54	
Latino	-11.16****	1.30		-2.10	1.53		-3.26**	1.35		1.02	1.50	
Personal Factors												
Non-English language				-9.63****	1.18					-7.10****	1.16	
Maternal education (less than high school) ¹				-2.96*	1.33					0.37	1.36	
Maternal education (high school or some college) ¹				1.28	1.12					1.69	1.10	
Chronic condition (vs. no)				2.22	1.43					0.71	1.40	
Potential Access												
No regular source of care							-12.08****	0.91		-11.44****	0.91	
Medicaid or SCHIP insurance ²							-4.10****	1.05		-2.76**	1.11	
Other/CHAMPUS insurance ²							-0.96	1.25		-1.00	1.25	
Uninsured ²							-9.94****	1.33		-7.96****	1.38	
R ²	.036***			.069****			.123****			.136****		
Adjusted R ²	.035***			.067****			.121****			.133****		

* $P < .05$, ** $P < .01$, *** $P < .001$, **** $P < .0001$ for the Beta value.
¹Compared to college graduate or beyond.
²Compared to commercial insurance coverage.

Table 5: P3C Subscale and Total Scores by Race-Language, Adjusted Means¹ (Range 0–100) N= 3340

P3C Scale	Asian (English Survey) N = 898	Asian (Non-English Survey) N = 263	African American N = 458	Latino (English Survey) N = 357	Latino (Non-English Survey) N = 935	White N = 479
Access	60.1****	55.2****	64.9	64.8	55.3****	66.4
Continuity	44.4**	22.1****	50.2	49.8	38.7****	48.7
Contextual Knowledge	59.5	59.8	62.0	61.3	54.0****	59.8
Communication	71.4****	63.7****	78.4	76.7	69.5****	77.1
Comprehensiveness	50.5**	46.2	54.0****	54.2****	52.7****	46.1
Coordination	50.6**	41.4****	58.5	55.8	46.3****	57.6
P3C Total	57.5*	51.3****	62.3	61.6	54.3****	60.2

* $P < .05$, ** $P < .01$, *** $P < .001$, **** $P < .0001$ compared to whites.

¹Adjusted for education, insurance coverage and type, regular source of care, and chronic condition.

Uninsured children score, on average, almost 8 points lower than children with commercial insurance, while children with Medicaid or SCHIP insurance score almost 3 points lower.

We assessed statistical threats to this analysis. First, we tested for an interaction effect between education and race/ethnicity. The adjusted R-squared in the main effects model and the interaction model differed by 0.004, so the interaction was not included in these models. Second, we tested for collinearity between SES (as measured by maternal education) and race/ethnicity or language, we created two models predicting the P3C total scale including only the dummy codes for (1) race/ethnicity and maternal education and (2) language and maternal education. Using *SAS*, we assessed collinearity by running each independent variable, in turn, as a dependent variable predicted by the other independent variables (SAS Institute 2003). The output for these diagnostic tests includes: (1) The condition index (an index greater than 30 is considered to be indicative of collinearity); (2) The tolerance (ranges from 0 to 1, scores closer to 0 are more collinear); (3) The variance inflation factor (VIF; a VIF greater than 10 is considered indicative of collinearity [<http://www.ats.ucla.edu/stat/sas/webbooks/reg/chapter2/sasreg2.htm>]). Our results showed that the largest condition index was 6.57 for SES and race and 4.43 for SES and language. The range of tolerances was 0.39 to 0.61 for SES and race and 0.49 to 0.71 for SES and language. The variance inflation factors ranged from 1.65 to 2.59 for SES and race and 1.4 to 2.0 for SES and language. Thus, we conclude that there is no significant collinearity between SES and race/ethnicity or language. Third, we tested whether the data was clustered by schools, using *STATA*, and found that accounting for clustering made a negligible difference in the R-square or adjusted means (STATA Corporation 1985).

Table 5 further examines the P3C subscale scores by race/language groups, adjusting for sociodemographics and access variables. As can be seen, African Americans and English-speaking Latinos are fairly similar to whites with respect to P3C scores, but non-English speakers (both Asians and Latinos) score lowest on the P3C. Controlling for the important effects of language, regular source of care, and insurance, however, did not entirely eliminate the disparity in primary care experience for English-speaking Asians.

DISCUSSION

This study examines the effects of race/ethnicity, language, and potential access on parents' reports of pediatric primary care quality, as measured by a

reliable and valid measure of parent reports of pediatric primary care, the P3C. In this sample, Asians and Latinos were less likely than African Americans or whites to have a regular source of care, and Latinos were the most likely to be uninsured. Unadjusted P3C means show that parent reports of primary care quality vary across race/ethnicity, with Asians and Latinos reporting lower perceptions of quality primary care than African Americans and whites. Bivariate relationships show that parents' perceptions of primary care quality are also related to language, chronic health condition status, mother's education, insurance status and type, and having a regular provider of care. In multivariate analyses, the data show how both language and potential access exert strong independent effects on parents' reports of primary care quality. Further, language and potential access, when included in the regression model, reduce the effects of race/ethnicity such that the coefficient for Latinos is no longer significant, and the coefficient for Asians is much smaller, though still significant. This is further detailed by examining the P3C adjusted subscale means across race/language groups. In this analysis, English-speaking Latinos report, in general, similar P3C scores compared to African Americans and whites, English-speaking Asians report intermediate scores, and non-English-speaking Latinos and Asians report the lowest scores.

These data suggest that English-language ability and potential access to care may account for, in large part, many of the reported differences in primary care experiences across race/ethnicity. However, for Asians these factors don't completely explain the differences. English-speaking Asians still report somewhat lower P3C scores even after controlling for the other study variables.

Several shortcomings exist in this study. First, the sample is not meant to be representative of a broader population other than the schools from which it was drawn. Extrapolations of these findings to broader populations should be made with caution. On the other hand, the diversity of this sample increases its policy relevance. Second, our measure of English-language ability is based on whether the respondent chose an English survey or one in Spanish, Vietnamese, or Tagalog. We did not measure English-language ability via a standard test, nor did we account for English-language ability of other members of the household. However, this operational definition is similar to that of previous researchers. Third, these data are cross-sectional. Follow-up data will allow conclusions regarding the direction of effect. Fourth, we did not have data on primary care providers, and so could not assess provider race/ethnicity or language. Further work is needed to determine the extent to which differences in parent reports are due to differences across providers, to

differences in how providers relate to different patients, or to concordance of patient-provider race/ethnicity and language. Providers who are similar to patients in race/ethnicity and language ability may provide care that is systematically different from that of providers dissimilar to their patients in these categories. Fifth, respondents were asked to report on current insurance status, which might have changed recently and might not coincide with the reports provided by the P3C. However, it is unlikely that there would be a systematic bias in such a lack of coincidence. Given the strong relationship between insurance status and P3C scores in the multivariate analysis, this relationship is likely to be robust to this threat to validity. Finally, in the sampling scheme, we dropped classes with less than a 50 percent return rate and substituted them, before analysis, with an additional randomly selected classroom. We did this to increase the response rate, but this might have introduced a bias into the sample, as classes with low rates of participation might be systematically different from other classes on variables that may be related to the issues at hand.

Our dependent variable, P3C scores, is based on parent report. Others have questioned the ability of consumers to be valid judges of aspects of primary care quality (Bindman et al. 1996), and we did not measure providers' "technical competence" (Stewart, Napoles-Springer, and Perez-Stable 1999) to corroborate parent reports via examination of the medical chart. Nevertheless, parents are in a unique position to report on the care their children receive (Crain et al. 1998; Dinkevich, Cunningham, and Crain 1998; Garwick et al. 1998; Homer et al. 1999). Indeed, some aspects of primary care (for example, accessibility, adequate communication, and contextual care) describe the parent's/patient's experience of care, rather than a specific provider behavior. Other aspects of care can be reliably reported by parents (for example longitudinal continuity, comprehensiveness). Parents have been shown to be accurate reporters of their child's medical history (Pless and Pless 1995), and parent reports have been shown to be more accurate than the medical chart, in comparison to direct observation, for reporting interpersonal aspects of clinical encounters (Stange et al. 1998). The P3C is explicitly based on parental reports of experience, not ratings of satisfaction. When parents rate satisfaction with care, these ratings are made in comparison to expectations regarding care (Starfield et al. 1998). As such, parent expectations, which may vary across race/ethnicity, language, or maternal education, might influence ratings of care. Reports of experience, on the other hand, are made in relation to prescriptive criteria of what high-quality care ought to be. These criteria do not vary across race/ethnicity, language, or

maternal education, and so these variables are not thought to influence reports of care.

Other reliable and valid instruments measure pediatric primary care overall (Safran et al. 1998; Starfield et al. 1998), or specific aspects of pediatric primary care such as preventive counseling (Bethell, Peck, and Schor 2001). Although no survey is currently widely used for ongoing measurement of pediatric primary care quality, the relative brevity and comprehensiveness of the P3C makes it a promising measure for such applications.

These data have implications for health care providers, policymakers, and researchers. They show that potential access—having health insurance and a regular provider of care—is indeed an important factor in primary care experiences. However, there is a difference in parental reports of primary care quality between children who have publicly funded health insurance and those with commercial insurance, and this difference persists even after accounting for race/ethnicity and language. Reasons for these differences deserve more scrutiny.

English-language ability emerges here as an important factor in primary care experiences. Its effect is slightly different across racial/ethnic groups. Including English-language in the regression equation reduces the coefficient for Latino race/ethnicity to nonsignificance, but does not completely eliminate the coefficient for Asians. More attention is warranted in examining the reasons why English-speaking Asians report lower P3C scores even after controlling for English-language ability (and, for that matter, potential access), and for examining differences across Asian ethnic groups.

Interestingly, SES, as measured by maternal education, did not emerge as a significant predictor of primary care quality in the multivariate analysis. This may be attributable to our abbreviated measurement of SES. However, this finding points to the need for more research to investigate the relative roles of SES, access, and language in pediatric primary care quality.

An interesting finding from the subscale analyses is the presence of very few racial and ethnic differences in contextual knowledge of the patient (only non-English-speaking Latinos reported lower contextual knowledge scores than whites). This may be attributable to the effect of controlling for having a regular source of care, which was the largest predictor of contextual knowledge. Also, with the exception of non-English-speaking Asians, all minority and language groups had significantly higher comprehensiveness of care scores than whites. These higher scores may, even after controlling for health insurance type, result from undetected differences in participation in managed care (often through Medicaid and SCHIP for minority groups) that

have been associated with a greater likelihood of receiving preventive care (Reid, Hurtado, and Starfield 1996; Gdomski, Jenkins, and Nichols 1998).

Eliminating racial/ethnic disparities in health and health care is a major component of the United States' public health strategy (U.S. Department of Health and Human Services 2000). Research regarding factors that affect primary care quality across these variables can inform this strategy. The data presented here suggest that continued attention should be paid to policies aimed at increasing potential access (in terms of both insurance status and having a regular provider of care) and in encouraging linguistically appropriate health care services.

APPENDIX: PARENT'S PERCEPTIONS OF PRIMARY CARE (P3C) ITEMS

Longitudinal Continuity

1. If there is **one particular place** that you take your child for almost all his/her health care **how long** has this been your child's place for health care?
2. If there is **one particular person** that you think of as your child's regular doctor or nurse, **how long** has this person been your child's doctor or nurse?

Access

3. Is it easy for you to **travel to** the doctor?
4. Can you see the doctor as soon as you want for **routine care** (check ups, physicals) for your child?
5. If your child is **sick**, can you see the doctor within one day?
6. Can you get help or advice on **evenings or weekends**?

Contextual Knowledge

7. Do you feel the doctor knows your child's **medical history**?
8. Do you feel the doctor knows your **concerns** about your child?
9. Do you feel the doctor knows your **values and beliefs** about health?
10. Do you feel the doctor knows your child **overall**?

Communication

11. Do you feel comfortable asking the doctor **questions**?
12. Does the doctor **explain things** to your satisfaction?
13. Does the doctor spend **enough time** with you and your child?
14. Does the doctor **listen to you**?

Comprehensiveness

15. Can the doctor **take care of** almost any problem your child might have?
16. Does the doctor talk to you about **keeping your child healthy**?
17. Does the doctor talk to you about **safety** (like car seats, seat belts, bike helmets, accidents)?
18. Does the doctor talk to you about your child's **growth**?
19. Does the doctor talk to you about your child's **behavior in general** (like having friends, citizenship at school)?

Coordination

20. When necessary, can the doctor **arrange for** other health care for your child?
21. When necessary, do you feel that the doctor **follows up** on visits to other health care providers?
22. Do you feel the doctor **communicates with** other health providers about your child, when necessary?
23. When necessary, do the doctor and the **school** work together for your child's health?

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