

Physician Implicit Attitudes and Stereotypes About Race and Quality of Medical Care

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Background: Recent reports speculate that provider implicit attitudes about race may contribute to racial/ethnic health care disparities.

Objectives: We hypothesized that implicit racial bias exists among pediatricians, implicit and explicit measures would differ and implicit measures may be related to quality of care.

Research Design: A single-session, Web survey of academic pediatricians in an urban university measured *implicit* racial attitudes and stereotypes using a measure of implicit social cognition, the Implicit Association Test (IAT). *Explicit* (overt) attitudes were measured by self-report. Case vignettes were used to assess quality of care.

Results: We found an implicit preference for European Americans relative to African Americans, which was weaker than implicit measures for others in society (mean IAT score = 0.18; $P = 0.01$; Cohen's $d = 0.41$). Physicians held an implicit association between European Americans relative to African Americans and the concept of "compliant patient" (mean IAT score = 0.25; $P = 0.001$; Cohen's $d = 0.60$) and for African Americans relative to European Americans and the concept of "preferred medical care" (mean IAT score = -0.21; $P = 0.001$; Cohen's $d = 0.64$). Medical care differed by patient race in 1 of 4 case vignettes. No significant relationship was found between implicit and explicit measures, or implicit measures and treatment recommendations.

Conclusions: Pediatricians held less implicit race bias compared with other MDs and others in society. Among pediatricians we found evidence of a moderate implicit "perceived patient compliance and race" stereotype. Further research is needed to explore whether physician implicit attitudes and stereotypes about race predict quality of care.

Key Words: racial and ethnic disparities, pediatric care, physician implicit attitudes and stereotypes

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In pediatric care, racial and ethnic disparities are found in mental health care, management of asthma, children's timely and appropriate receipt of medication, preventive screening, referral to specialists, renal care, kidney transplant list placement and other areas of care.^{1–11} The Institute of Medicine (IOM) report, *Unequal Treatment* found indirect but strong evidence of racial discrimination in all levels of health care, from policy level to individual interpersonal interactions.⁴ The IOM identified health care provider bias, stereotyping and clinical uncertainty as factors that may contribute to health care disparities.⁴ In the report, there was speculation that provider implicit attitudes and stereotypes that may affect quality of care.⁴ Modern racial bias, prejudice, and discrimination are often subtle, unconscious, unintentional, and difficult to detect.¹² Johnson et al¹³ studied provider-patient communication and found that physicians were 33% less patient centered, 23% more verbally dominant and that physician affect was less positive with African American patients compared with white patients.

Implicit attitudes and stereotypes that favor whites have been measured even among people who explicitly express nonbiased attitudes and view themselves as nonprejudiced, egalitarian, and nondiscriminatory in their actions.^{14,15} Implicit attitudes and stereotypes are by nature outside of personal awareness.¹⁶ Advances in social psychology find that implicit racial biases are more related to racially prejudiced behaviors than are attitudinal measures assessed by self-report (Poehlman AT, Uhlman E, Greenwald AG, Banaji MR. Understanding and using the Implicit Association Test: III. Meta-analysis of predictive validity. Submitted for publication). Dovidio and Gaertner¹⁴ found that, despite self-reports of egalitarian beliefs, well-educated and liberal whites exhibited prejudice and behaved in a discriminatory way in situations that were ambiguous and in situations where differential treatment could be rationalized. Banaji et al¹⁷ demonstrated that information that produces social stereotypes can be derived from information temporarily retrieved for an unrelated task in an unrelated circumstance. Physicians routinely use heuristics or cognitive shortcuts such as pattern recognition and stereotyping of disease to form a diagnosis

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and develop a treatment plan.^{18,19} Pressure of time may interfere with retrieval of information and decision-making.²⁰ Bias and error in medical decision-making are more likely to occur in circumstances such as clinical uncertainty, high workload, physician fatigue and high levels of cognitive stress.^{21–23} It is possible, especially under circumstances of high cognitive demand, that a health care provider may be unaware they hold implicit attitudes and stereotypes about race but these implicit social biases may be retrieved with medical information and unknowingly influence quality of care. Despite known disparities in pediatric care, there are no published reports that measure pediatricians' implicit and explicit attitudes and stereotypes about race and their relation to the quality of pediatric care.

The Implicit Association Test (IAT) is an indirect measure of implicit social cognition widely used in social psychology to measure implicit attitudes and stereotypes.²⁴ Research shows that the majority of over 1 million Race Attitude IAT test takers hold some degree of implicit preference for European Americans relative to African Americans and that implicit and explicit attitudes differ.^{25,26} A subsample of Race Attitude IAT Internet test takers who identified as MDs (N = 2523), showed strong implicit preference for whites (Sabin JA, Greenwald AG, Nosek BA, Rivara FP. Measuring MD implicit and explicit racial bias: findings from a public research web site. In progress). Green et al²⁷ in the single published study to measure implicit attitudes and stereotypes about race among a targeted sample of internal medicine and emergency medicine physicians found strong implicit preference for White Americans relative to African Americans, an implicit association of black patients with the concept of being "less cooperative" than white patients and a relationship between strength of implicit bias and quality of care.

Based on prior research, we hypothesized that: (1) pediatricians would show strong implicit preference for European Americans relative to African Americans on the *Race Attitude IAT*, (2) pediatricians would show a strong implicit association between European Americans versus African Americans and the concept of "compliant patient" and, (3) pediatricians' implicit and explicit attitudes would differ. Based upon research by Green et al,²⁷ which found a relationship between IAT measures and quality of care and research that generally finds a relationship between IAT scores and discriminatory behavior (Poehlman AT, Uhlman E, Greenwald AG, et al. Understanding and using the Implicit Association Test: III. Meta-analysis of predictive validity. Submitted for publication), we sought to explore whether: (1) we would find differences in quality of care by patient race using case vignettes, and (2) strength of implicit race bias would be related to quality of care.

METHODS

Subject Recruitment

Respondents were pediatric faculty, fellows, and residents recruited from 1 department at a large, urban research university. The 20-minute, single-session, anonymous Web survey was implemented on Harvard University's *Project Implicit* Web server. The University's Human Subjects Divi-

sion, Institutional Review Board approved all procedures before subject recruitment and Harvard University has approved the *Project Implicit* server as a site to implement IAT research. We introduced the purpose of the survey as exploring "physician knowledge, attitudes towards patients and practices regarding quality of medical care" to minimize response bias based upon preknowledge that the study was about issues of race. Outside access to the survey was restricted and all procedures were designed to protect participants' anonymity.

Data Collection

The data collection period was from September 20, 2005 to October 24, 2005. Response rate was 58%, (N = 95), with 53% completing all measures. Response rate for faculty was 65% (n = 39) and for fellows/residents 54% (n = 56). Seven participants dropped out before completing the Implicit Association Tests. Two more participants dropped out before completing explicit questions, which were presented last.

Total Eligible Sample Versus Responders

We compared the total eligible sample to responders by sex and race/ethnicity to determine whether there was a response bias. We did not have access to other comparative domains. There were differences by sex between the total eligible sample (51% female) versus responders (65% female). Total department sample was 84% white compared with 82% white for responders.

Study Measures

Measures included in the study were purposefully presented in the following order of appearance to minimize social desirability effects on response; physician characteristics, practice characteristics, 4 case vignettes, implicit measures (the Implicit Association Test), and explicit measures (self-report).

The Implicit Association Test (IAT)

The Implicit Association Test measures the relative association strength of a target concept such as *race*, for example, Black American versus White American, and a *value category* such as good versus bad. Test takers are asked to quickly sort and categorize 2 pairs of images and words as they appear on the screen using either a right and left computer key. The IAT is based on the assumption that concepts that are readily associated mentally to the test taker will be sorted more quickly than concepts that are more weakly associated.^{15,24} The IAT score is derived from the averaged difference in response time on these 2 key tasks on the IAT.²⁸ For example, on the *Race Attitude IAT*, faster responses for the (*White + Good/Black + Bad*) combined task compared with responses to the (*Black + Good/White + Bad*) combined task indicate a stronger association of *White* than of *Black* with *good*. This difference in response time is interpreted as an implicit or automatic preference for whites. The IAT is a versatile methodological tool that can be used to measure implicit attitudes toward one racial group compared with another and to measure attitudes or stereotypes about

gender, age, ability, sexual orientation, obesity, politics, religion, personality, and consumer products.¹⁵ There is often a difference observed between IAT-measured implicit attitudes and stereotypes and self-report, suggesting they are related but distinct domains.^{15,26,29} A meta-analysis of 103 studies of predictive validity of IAT measures found that IAT measures predicted prejudice and stereotyping behaviors more effectively than did self-report (Poehlman AT, Uhlman E, Greenwald AG, Banaji MR. Understanding and using the Implicit Association Test: III. Meta-analysis of predictive validity. Submitted for publication). Information about the science of the IAT and publications of IAT research can be found on the Project Implicit web site (<https://implicit.harvard.edu>) and at (<http://faculty.washington.edu/agg/>).

This study used 3 Implicit Association Tests. We used the *Race Attitude IAT*²⁴ and developed the *Race and Compliant Patient IAT* and the *Race and Quality of Medical Care IAT* for this study using published IAT design procedures.²⁴ Each participant took 2 Implicit Association Tests. The *Race and Compliant Patient IAT* was assigned to all subjects and was presented first. Participants received random assignment of a second IAT, either the *Race Attitude IAT* or the *Race and Quality of Medical Care IAT*. For all 3 IATs morphed facial images labeled as African American and European American represented *race*. The *Race Attitude IAT* asks participants to pair African American and European American facial images with the value categories of *good versus bad*. Words used to represent the concept of *good* in our study were: *joy, love, peace, wonderful, pleasure, glorious, laughter, happy*. Words used to represent the concept of *bad* were: *agony, terrible, horrible, nasty, evil, awful, failure, hurt*. For the *Race and Compliant Patient IAT* words used to represent the *compliant patient* category were: *willing, cooperative, compliant, reliable, adherent, helpful*, and words used to represent the *reluctant patient* category were: *reluctant, doubting, hesitant, apathetic, resistant, lax*. For the *Race and Quality of Medical Care IAT*, words used to represent the concept of *preferred medical care* were: *superior, preferred, ideal, best, excellent, and finest* and words used to represent the concept of *acceptable medical care* were: *standard, routine, acceptable, typical, adequate, okay*.

Explicit Bias Measures

Explicit measures that correspond to the targeted concepts in the IATs were obtained by self-report. We used the following 2 items: *My feelings towards African Americans are . . . and My feelings towards European Americans are . . . (Answer options ranged from 0 = cold to 10 = warm)*. We asked subjects to respond to 4 additional explicit questions: *In general, members of which group are more likely to be regarded as compliant patients? In your own medical practice, members from which group are more likely be compliant patients? In general, which group is more likely to receive preferred medical care versus acceptable medical care? In your own medical practice, for which group are you more likely to prescribe preferred medical care versus acceptable medical care?* For these 4 questions, answers ranged from 1 to 7, (1 = African Americans are more likely, 4 = AA and

EA equally likely, to 7 = European Americans are more likely).

Case Vignettes

We designed 4 pediatric case vignettes, each with 2 race conditions (African American and white) to determine whether there were differences in treatment recommendations by patient race for pain control, management of urinary tract infection (UTI), Attention Deficit Hyperactivity Disorder, and asthma control (scenarios available from corresponding author). Each participant randomly received 2 vignettes in which the patient was described as African American and 2 in which the patient was described as white. Each vignette was a scenario that this sample of pediatricians would likely encounter in their own clinical practice and was purposefully designed to contain clinical ambiguity. Participants were asked to respond to each treatment recommendation using a 5-item scale that ranged from: (1) *I strongly disagree, this is clearly the wrong treatment option*; (2) *I disagree. This is the wrong treatment option*; (3) *I neither agree nor disagree with this treatment option*; (4) *I agree. This is a good treatment option*; and (5) *I strongly agree. This is clearly a good treatment option*. Treatment recommendations for each case depicted one option that was ideal care based upon best care practices and the other option(s) represented adequate or good enough care. None of the options represented negligent or inadequate care.

Statistical Analysis

For the implicit measure, the mean IAT score, known as the IAT D score, is derived by using a scoring algorithm that calculates the difference between an individual's mean response speeds on 2 key sections of the IAT.²⁸ IAT scores range from -2 to $+2$, with zero indicating no implicit bias.³⁰ The IATs in this study were designed according to IAT guidelines so that a positive direction indicated automatic preference for European Americans.²⁸ For detailed information on the IAT scoring algorithm see Greenwald et al (2003).²⁸ One-sample *t* tests were used to determine whether the mean IAT score was significantly different from 0, confidence intervals were used to gain insight into interpretation of significance values and Cohen's *d* was calculated to obtain a standardized effect size to interpret magnitude of implicit race bias. For Cohen's *d*, effect size is interpreted as: *d* of 0.2 = small effect; *d* of 0.5 = medium effect; and *d* of 0.8 = large effect.³¹ A difference score was calculated between the 2 explicit "feelings" items and a one-sample *t* test was used to determine whether the difference was statistically significant. Pearson's correlation coefficient (*r*) was used to determine the relationship between physician characteristics, implicit measures, explicit measures, and differences in treatment recommendations by patient race. For each case vignette, we calculated quality of care as a difference measure between an individual's response to the ideal treatment recommendation versus the other recommendation(s) and used a one-way ANOVA to determine if there was a significant difference in treatment recommendations by patient race. We created a composite within-subject difference measure using the difference measure

for each participant’s treatment recommendations for 2 white cases and 2 African American cases and used this quality of care measure to analyze the relationship between treatment recommendations, implicit measures, and explicit measures. SPSS software was used for all statistical analysis (SPSS for Windows, Rel. 11.0.1.2001. SPSS Inc., Chicago, IL).

RESULTS

Physician Characteristics

Our pediatrician sample was 65% female, 93% were American born and 82% self-identified as non-Hispanic white. (Table 1). The sample was comprised of faculty (41%), and fellows/residents (59%). Fifty-seven percent reported that more than 60% of their patients seen in the last month were white.

Explicit Measures

One-sample *t* test results showed no significant difference in reported feelings towards European Americans and African Americans (*P* = 0.51). However, when asked to report about their “own practice,” 76% reported associating the concept of “compliant patient” with African American patients rather than white patients and 86% reported associating the concept of “preferred medical care” with African American patients compared with white patients (Table 2).

Implicit Association Tests

All Implicit Association tests were statistically significant; however, magnitude of effect size, measured by Cohen’s *d*, varied (Table 3). The results of the *Race Attitude IAT* indicated a small implicit preference for European Americans relative to African Americans (mean IAT score = 0.18; Cohen’s *d* = 0.41). For the *Compliant Patient IAT*, we found a moderate implicit association between the concept of “compliant patient” and European Americans compared with African Americans (mean IAT score = 0.25; Cohen’s *d* = 0.60). The mean IAT score on the *Quality of Medical Care IAT* was negative, indicating a moderate association between the concept of preferred medical care and African Americans

TABLE 1. Characteristics of Pediatrician Sample (N = 95)

Characteristics	N	%
Female	62	65
Age (yr)		
20–30	40	42
31–40	31	33
>41	24	25
Professional status		
Resident/fellow	56	59
Race/ethnicity		
White	78	82
Country of birth		
United States	89	94
Diversity of patients		
>60% of patients white	54	57

TABLE 2. Explicit Results (Self-Report of Attitudes About Race and Medical Care)

	AA More Likely		AA/EA Equally Likely		EA More Likely	
	N	%	N	%	N	%
In general which group more compliant? N = 86	39	45	31	36	16	19
In your practice which group more compliant? N = 86	65	76	18	21	3	4
In general which group more likely to receive preferred medical care? N = 84	29	35	22	26	33	39
In your practice which group more likely to receive preferred medical care? N = 83	73	88	10	12	0	

AA indicates African American; EA, White American.

rather than European Americans (mean IAT score = -0.21; Cohen’s *d* = 0.64).

Correlational Results

The explicit measures were related to one another and the 3 Implicit Association Tests were related to one another but, as expected, we found no significant relationship between the explicit measures and the 3 implicit measures (Table 4). We found a significant, positive relationship between physician age and an implicit association with European Americans and the concept of “compliant patient.” We found no significant relationship between physician race/ethnicity and implicit measures. For the composite within-subject treatment difference score between each participant’s 2 white cases and 2 African American cases in which there were 2 randomization conditions, we found no significant relationship between quality of care and the 3 implicit measures. We found a significant association between one explicit measure and one quality of care condition.

Case Vignette Comparisons by Patient Race

We compared treatment recommendations by patient race. Pediatricians identified the ideal treatment recommendation more frequently for all cases except for asthma care (Table 5). There was no significant difference in recommendation differences by patient race except for management of UTI. For UTI, the ideal care option (home care rather than hospital care) was more often recommended for the African American patient rather than the white patient (71% vs. 55%; *P* = 0.03). The white patient was more often recommended to receive 14 days of antibiotic treatment inpatient, which may represent unnecessary hospitalization for white pediatric patients.

DISCUSSION

This is the first study to measure pediatricians’ explicit and implicit attitudes and stereotypes about race and their

TABLE 3. Implicit Attitudes: Race and Medical Care

Implicit Association Test (IAT D Score)	N	Mean	SD	95% CI	Cohen's <i>d</i> (Effect Size)
IAT-race	43	0.18*	0.44	±0.14	0.41
IAT-race and compliant/reluctant patient	88	0.25 [†]	0.42	±0.10	0.60
IAT-race and preferred/acceptable medical care	45	-0.21 [†]	0.33	±0.10	0.64

IAT D scores range from -2 to +2, with 0 indicating no bias. A positive mean indicates some degree of preference for European Americans, a negative mean indicates preference for African Americans. Effect size: Cohen's *d* is a standardized effect size, interpreted as; *d* of 0.2 = small effect, *d* of 0.5 = medium effect, and *d* of 0.80 = large effect.
One-sample *t* tests, **P* ≤ 0.01.
One-sample *t* tests, [†]*P* ≤ 0.001.

TABLE 4. Intercorrelations Physician Characteristics, Explicit Measures, Implicit Measures, and Treatment Recommendation Difference Scores

	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Characteristics															
1. Sex	95	1.0													
2. Age	95	-0.29**	1.0												
3. Race/ethnicity	95	-0.03	0.03	1.0											
4. % patients white	95	0.08	-0.14	0.20	1.0										
Explicit measures															
5. Feeling thermometer [†]	86	-0.03	0.21*	0.05	0.24*	1.0									
6. In general preferred	84	-0.09	0.21	-0.18	-0.06	0.05	1.0								
7. In own practice preferred	83	-0.01	0.28*	0.06	0.32**	0.45**	0.31**	1.0							
8. In general compliant	86	0.17	-0.06	-0.14	0.12	0.18	0.35**	0.04	1.0						
9. In own practice compliant	86	0.11	-0.01	0.01	0.27*	0.26*	-0.15	0.23*	0.24*	1.0					
Implicit measures [‡]															
10. Race IAT	43	0.16	0.08	-0.20	0.05	0.05	0.12	0.16	0.13	-0.08	1.0				
11. Compliant IAT	88	0.02	0.22*	0.00	0.11	0.21	-0.03	-0.05	0.05	0.16	0.39*	1.0			
12. Preferred care IAT	45	0.17	0.14	0.03	0.07	0.03	-0.17	-0.17	0.26	0.16	na	0.34*	1.0		
Treatment recommendations [§]															
13. Within-subject difference A	60	-0.31*	0.08	-0.07	-0.01	0.09	-0.03	-0.07	0.10	0.15	0.00	0.16	-0.28	1.0	
14. Within-subject difference B	33	-0.05	-0.06	0.16	0.23	0.19	0.13	0.33	0.07	0.39*	-0.04	-0.05	0.09	na	1.0

Two randomization conditions:

●Condition A = Case 1 + 2 African American (-) Case 3 + 4 White.

●Condition B = Case 1 + 2 White (-) Case 3 + 4 African American.

P* = 0.05, *P* = 0.01.

[†]Feeling thermometer: Difference score between feelings toward White Americans (-) feelings toward African Americans (scale: 0 = Cold, Warm = 10).

[‡]Explicit measures: (1) indicates AA extremely more likely; (4), AA and EA equally likely; (7), EA extremely more likely.

[§]Within-subject difference = between difference in ideal care versus adequate care for 2 African American cases and 2 white cases.

relation to quality of care and our results were consistent with some of our hypotheses and inconsistent with others. The majority of pediatricians reported no difference in feelings toward racial groups, but when asked about patients in their own practice, they reported attitudes that strongly associated African Americans with the concept of "compliant patient" and "preferred medical care." The explicit questions asked about general beliefs and reports about the physician's own practice and response to these 2 domains differed. The explicit questions were presented after the IATs; therefore, by the time the explicit questions were presented, pediatricians were aware that this study was about racial issues. Social desirability may have influenced report of attitudes in the physician's own practice but we do not know if social desirability accounts for this result. As expected, we did not find a strong relationship between physicians' self-report and implicit measures. This is consistent with previous research

that finds that explicit and implicit attitudes about race are often dissimilar.^{15,25,32}

The results of data collected from the over 1 million people who have taken the *Race Attitude IAT*, including 1 sample of Project Implicit test takers who self-identified as MDs, and 1 targeted sample of MDs, show that the majority of test takers hold strong implicit or automatic preference for White Americans relative to African Americans (Sabin JA, Greenwald AG, Nosek BA, Rivara FP. Measuring MD implicit and explicit racial bias: findings from a public research web site. In progress).^{25,29,33} Our sample of pediatricians showed less implicit preference for whites compared with the majority of large numbers of IAT test takers. There may be characteristics of our sample such as training specific to this group of physicians, the way in which pediatricians generally are trained, life experiences or other characteristics that may contribute to the unexpected weak implicit race bias found

TABLE 5. Vignettes: Difference in Treatment Recommendations by Patient Race

Treatment	African American			White			P†
	N*	M	SD	N	M	SD	
(1) Pain control							
<i>Oxycodone</i> ‡	61	3.28	0.97	33	3.00	0.94	0.13
Ibuprofen	60	2.30	0.80	33	2.48	0.71	
(2) Management of UTI							
<i>Home</i>	61	3.77	0.72	33	3.42	0.79	0.03
Inpatient	60	2.95	0.83	33	3.24	0.87	
(3) ADHD							
<i>IEP/long act Ritalin</i>	33	3.94	0.83	60	3.78	0.92	
IEP/behavior	33	4.03	0.85	60	4.08	0.77	0.52
IEP/short act Ritalin	33	2.70	0.88	60	2.63	1.02	
(4) Asthma control							
<i>Refer to pulmonary</i>	33	3.33	1.02	58	3.16	0.97	0.09
Refer back to PCP	33	3.64	0.82	58	4.00	0.70	

Response scale was 1 to 5, with 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree.

*Difference in N for each vignette condition due to random assignment by patient race.

†Analysis of variance by patient race for difference between ideal treatment recommendation versus other recommendation(s).

‡Ideal treatment recommendation for each vignette is italic.

among this group of physicians. Future research is needed to better understand this intriguing finding.

Treatment recommendations are legitimately based upon a physician’s judgment and assessment for whether a patient will be compliant with a treatment.³⁴ Bogart et al³⁴ found that physicians expected African American men to be less likely to adhere to HIV treatment compared with white men and that this association had an effect on treatment recommendations. It is not known whether patient race is implicitly associated with a physician’s perception of patient compliance. Green et al²⁷ found that physicians held strong implicit associations for black patients as being “less cooperative” and demonstrated that this implicit bias was related to quality of care. Similarly, in our study of pediatricians we found a moderate implicit association between the concept of “compliant patient” and European Americans rather than African Americans. We labeled this an “implicit perceived compliance and race” stereotype. Remarkably, we found this implicit racial stereotype among a group of providers who express explicit attitudes that favor African Americans and who show less implicit race bias on the *Race Attitude IAT* than others. Contrary to our hypothesis that we would find an implicit stereotype between European Americans and concept of “preferred medical care,” we found a moderate implicit association between African Americans and “preferred medical care.” Further research on the validity of the *Quality of Medical Care IAT* through replication is needed to better understand this result.

We found a significant positive relationship between physician age and an implicit association with European Americans and the concept of “compliant patient.” We do not know whether physicians who have been in practice longer hold stronger implicit race bias. Research shows that physicians with greater years in practice may be less receptive to new standards of care and possess less factual knowledge than younger physicians.³⁶ Future research will need to ex-

amine physician years in practice and determine whether strength of implicit attitudes and stereotypes about race are stronger among physicians with greater years in practice.

Case decision vignettes are a valid tool to measure clinical practice and quality of medical care.^{37,38} We found a difference by patient race in recommendations for hospitalization versus outpatient care for treatment of a case of UTI, with the white patient more likely than the African American patient more likely to receive the ideal treatment option of care at home with home health care and the white child more likely to receive 14 days of hospitalization. This may represent over-hospitalization for the patient described as white. This finding is consistent with a recent study that examined severity of illness and pediatric hospitalization rates and found that white pediatric patients compared with black and Hispanic children are over-admitted when not severely ill.¹¹ Contrary to our hypothesis, we did not find a relationship between difference in treatment recommendations by patient race and implicit measures.

There were several limitations in our ability to generalize results to all pediatricians. First, the response rate for those who completed all measures was 53%. This rate is not surprising because response rates of pediatricians to surveys have consistently dropped during the past decade.³⁹ Our sample size was small, which limits our ability to generalize our results. Second, there seemed to be a female gender response bias in our study. We cannot speculate if or how physician gender may have influenced the results. Third, we surveyed physicians from 1 department in a large university, which limits our ability to generalize the results to all pediatricians. Fourth, this was the first time the *Compliant Patient IAT* and the *Quality of Medical Care IAT* have been used and their validity will need to be tested through replication. Last, case vignette decisions are not real world clinical practice and we cannot determine whether the treatments recommended

on the case vignettes represent pediatricians' real world clinical practice decisions.

Despite the limitations of our study, the results extend knowledge by providing informed direction for future research in this emerging area of study. Unexpectedly, we found less racial bias among this group of pediatricians on the *Race Attitude IAT* compared with large numbers of IAT test takers and other MDs who have taken the *Race Attitude IAT*. We found an "implicit perceived compliance and race" stereotype. This is similar to the one other study of implicit race bias among physicians, which found an implicit association with black patients as "less cooperative."²⁷ We found that implicit and explicit measures were not related suggesting that these are 2 areas of cognition that diverge. This is finding is consistent with social psychology research.^{26,32} Inconsistent with our speculation and with research by Green et al, we did not find a relationship between implicit measures and quality of care. Future research will need to study a nationally representative sample of pediatricians to determine whether pediatricians, generally, hold less implicit race bias than other MDs and others in society and if so why, and whether and under what conditions implicit racial bias may influence quality of care.

Early research suggests that implicit attitudes and stereotypes may be amenable to change. Strategies aimed at changing implicit attitudes and stereotypes about race and ethnicity include stimulating social desirability, suppression of known prejudices, and the promotion of counter-stereotypes.⁴⁰ Dasgupta and Greenwald⁴¹ exposed individuals to counter-stereotypes, such as positive racialized exemplars (eg, Denzel Washington) coupled with exposure to negative white exemplars (eg, Timothy McVeigh). This approach reduced implicit racial bias by 50% and the reduced bias effect remained when measured 24 hours later.⁴¹ Rudman et al⁴² found that white participants who anticipated holding a less powerful role in an upcoming interaction with a black individual had a less negative attitude toward the black individual. Identifying implicit associations among health care providers, such as an "implicit perceived compliance and race" stereotype and incorporating methods to change implicit bias into clinical training may be one approach to improving quality of care delivered to minority populations. Future research is needed to gain a better understanding of the complex psychologic interactions that exist between physician implicit and explicit attitudes and stereotypes about race, physician perceptions of patient characteristics, physician characteristics, organizational characteristics, and quality of medical care.

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