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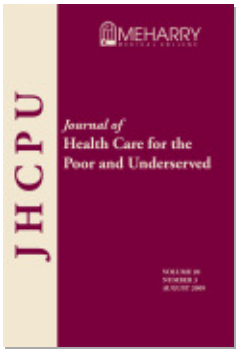

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Physicians' Implicit and Explicit Attitudes About Race by MD Race, Ethnicity, and Gender

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Abstract: Recent reports suggest that providers' implicit attitudes about race contribute to racial and ethnic health care disparities. However, little is known about physicians' implicit racial attitudes. This study measured implicit and explicit attitudes about race using the Race Attitude Implicit Association Test (IAT) for a large sample of test takers (N=404,277), including a sub-sample of medical doctors (MDs) (n=2,535). Medical doctors, like the entire sample, showed an implicit preference for White Americans relative to Black Americans. We examined these effects among White, African American, Hispanic, and Asian MDs and by physician gender. Strength of implicit bias exceeded self-report among all test takers except African American MDs. African American MDs, on average, did not show an implicit preference for either Blacks or Whites, and women showed less implicit bias than men. Future research should explore whether, and under what conditions, MDs' implicit attitudes about race affect the quality of medical care.

Key words: Racial and ethnic health care disparities, implicit and explicit attitudes about race, physician racial bias, physicians, gender, race, ethnicity.

Racial and ethnic health care disparities are well documented and persistent.[1–15] These disparities manifest themselves across a wide range of clinical services, even in systems where access is universal (such as the Veteran's Affairs system).[16] The Institute of Medicine (IOM) report on racial and ethnic health disparities, *Unequal Treatment*, found evidence of poorer quality of care for minority patients in studies of cancer treatment, treatment of cardiovascular disease, rates of referral for clinical tests, access to a kidney transplant wait list, Black children's receipt of medication, mental health assessment and services, diabetes management, pain management, and other areas of care.[1] Racial and ethnic disparities exist in physician communication behaviors and in physician perceptions of patients.[17–21] For example, Johnson and colleagues documented

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physician behavior during real-world clinical interactions and found that physicians spent less time with African American patients, were more verbally dominant, and had a less positive affect with African American patients than with White patients.[6] Another study found that physicians perceived African American men to be less likely than White men to adhere to HIV treatment and that this association affected treatment recommendations.[18]

The Institute of Medicine identified health care provider bias, stereotyping, and clinical uncertainty as factors that may contribute to health care disparities.[1] Contemporary racial bias, prejudice, and discrimination in the U.S. can be subtle, unconscious, and imperceptible.[22] A number of health care leaders believe that future areas for health care disparities research must examine provider cognitive and affective processes such as implicit and explicit attitudes and stereotypes.[1,16,17,19,23–31] *Explicit* (self-reported) attitudes are beliefs that are known to the individual and can readily be expressed by self-report.[32,33] *Implicit* (non-conscious) attitudes are beliefs that are not readily apparent to the individual and can differ markedly from a person's explicit and expressed beliefs.[32–36] As a consequence, implicit prejudice, discrimination, and bias can be observed in the absence of any intention to discriminate.[22,32,33,37,38] Implicit and explicit attitudes are distinct dimensions of cognition[32] and it is not unusual for an individual's implicit and explicit attitudes to be dissimilar.[35] Implicit attitudes are more closely associated with non-verbal behavior, whereas explicit attitudes predict verbal behavior.[33] The dissociation of implicit and explicit attitudes and the subtle influence of implicit attitudes on behavior have implications for health care providers and patients in the clinical setting. An individual may believe s/he is not prejudiced but may hold implicit attitudes about race which may unintentionally influence behavior in a prejudiced way.[38] In the more affective dimensions of social interactions (such as non-verbal behavior) implicit attitudes and beliefs appear to be a better predictor of phenomena such as prejudice and discrimination than self-reported attitudes.[39] Theoretically, implicit social attitudes may influence provider facial expression, warmth, and other non-verbal behaviors. This behavior is not overt discrimination, which is easy to recognize, but is non-conscious behavior that may subtly affect provider assessment and decision-making, patient perceptions of the provider and quality of care.

The Implicit Association Test (IAT), a widely used measure of implicit social cognition,[36,40,41] finds that some degree of implicit racial bias is common in the general population.[41] More than 70% of the over one million individuals who have completed the *Race IAT* show some degree of an implicit preference for White Americans over Black Americans, even when such a preference is denied in explicit attitudes and values.[41] A large body of evidence shows that despite self-reports of egalitarian beliefs, individuals may show prejudiced behavior in situations that are ambiguous and uncertain or when under pressure of time, and this behavior may occur automatically or unintentionally.[33,34,38,42,43] This leads to speculation that some health care disparities may be the function of normal cognitive processes in which subtle or implicit attitudes and beliefs unintentionally affect physician behavior and quality of care.[1,23,27,44]

Two recent studies have measured physicians' implicit attitudes about race. The first study measured physicians' implicit attitudes and stereotypes about race and quality of care, finding that internal medicine and emergency medicine physicians hold strong

implicit attitudes favoring White Americans over Black Americans.[45] Physicians with greater implicit pro-White bias were more likely to treat White than Black patients with thrombolysis for acute coronary symptoms.[45] The study found that physicians implicitly associate Black patients (vs. White patients) with being "less cooperative."[45] Those who strongly associated Black patients with being "less cooperative" were less likely to refer Black patients with acute coronary symptoms for thrombolysis.[45] A similar study of pediatricians found less racial bias among pediatricians than among others in society and other MDs.[46] The study did find an implicit association between White patients (vs. Black patients) and being "compliant;" among these low-bias physicians, however, no relationship was found between implicit attitudes about race and medical care.[46] A third study by the National AIDS Research Institute, Bhosari, India, found that implicit bias toward HIV patients among doctors and nurses who treat HIV patients was related to discrimination.[47]

Physician self-reported beliefs about unfair treatment due to race vary by physician gender and physician race/ethnicity, with non-White and female physicians more likely to agree that patients are treated unfairly due to race/ethnicity.[48] The Kaiser Family Foundation (KFF) *2002 National Survey of Physicians* found variations in physicians' report of attitudes about unfair treatment due to race by physician gender, with 39% of female vs. 26% of male physicians agreeing that people are treated unfairly due to race *very* or *somewhat often*.[48] Twenty-five percent of White physicians, compared with 52% of Latino physicians, 33% of Asian physicians, and 77% of Black physicians thought that patients are treated unfairly due to their race or ethnicity *very* or *somewhat often*.[48]

There is evidence that those with high levels of education have more liberal self-reported attitudes about race,[49] but little is known about implicit attitudes about race among those with doctorate degrees. Our study aimed to compare implicit and explicit MD preferences among a large sample of MDs to the entire heterogeneous sample and with specific subsets of interest—in particular, those with other types of doctoral training (JDs, and PhDs). We collected data from a large sample of test takers (N=404,277) including a subsample of MDs (N=2,535) who accessed the *Project Implicit®* demonstration Web site at Harvard University and the University of Virginia to measure and compare physicians' implicit and explicit attitudes about race, using the *Race Attitude Implicit Association Test* (IAT). Based upon research in social psychology, we hypothesized that MDs would implicitly prefer White Americans relative to Black Americans as others in society have been found to do. There is evidence that African Americans generally do not show preference for either White Americans or Black Americans on the Race IAT.[41] In the one study that examined implicit race bias among physicians by MD race/ethnicity, Black physicians showed no bias for either White or Black Americans.[45] We hypothesized that that this pattern would be similar among a large sample of MDs. Research shows that after controlling for education, women generally report more liberal racial attitudes than men on most questions about race.[49] We expected that women generally, including female MDs, would display less implicit racial bias than men. Based upon prior research,[41] we hypothesized that implicit racial preferences would be stronger than explicit racial preferences among MDs and others.

Methods

Participants and procedures. Test takers voluntarily, and without contact from the researchers, accessed a public demonstration Web site, known as *Project Implicit®*, operated at Harvard University (https://implicit.harvard.edu/) and opted to complete the *Race Attitude Implicit Association Test* (IAT). Participants arrived at the site because of media coverage, friend or coworker recommendations, class or work assignment, blog discussion, random web surfing, and a variety of other mechanisms. As an unselected, volunteer sample, the sample is very large and diverse; however, it should not be mistaken for a representative sample of a defined population. Nonetheless, its size and diversity makes it useful for comparative analysis and broadens opportunities for generalization of laboratory investigations using narrow samples. Project Implicit® Virtual Laboratory sampling and experimental procedures are discussed in detail in the literature.[40]

We examined data from visitors to the demonstration web site (N=404,277) during a 28-month period (from January 12, 2004 to May 12, 2006). Test-takers reported their race/ethnicity, country of residence, age, sex, and highest level of educational attainment. We identified MD test takers through self-report of their highest education level as "MD" (n=2,535). Although MDs were the main focus of our analysis, for comparison we examined two other sub-samples who reported a high level of educational attainment: JDs (n=6,144), and PhDs (n=7,952). Appropriate University Institutional Review Boards have approved reporting findings from data received via the *Project Implicit®* public demonstration Web site.

Measures. *The Implicit Association Test (IAT)*. We used the Implicit Association Test (IAT), an indirect measure of implicit social cognition developed by A.G. Greenwald and colleagues. In the past decade, the IAT has been the subject of over 450 peer-reviewed publications. The IAT has become widely accepted as a measure of implicit social cognition because it achieves good reliability in comparison other implicit measures,[40,50,51] is relatively robust with repeated assessment for pre-post evaluation,[40,52] captures evaluations that are related, but distinct from self-report,[35,40,42] and has predictive validity.[39] The IAT is a timed cognitive test measuring the relative association strength between two pairs of concepts, a target concept such as *race* (White American vs. Black American) and an *evaluation* (good vs. bad).[36] The IAT shows convergent validity with other measures of implicit cognition,[50,53] and is related, but distinct from explicit attitude reports.[35,41]

In the race Attitude IAT, test takers are asked quickly to categorize facial images and value laden words as they appear on a computer screen into pairs by pressing either a right or left computer key.[36] Participants are asked to categorize Black faces and "good" words with one key and White faces and "bad" words with the other key and then the task is reversed, White faces and "good" words with one key and Black faces and "bad" words with the other key (try the test at https://implicit.harvard.edu/). The difference in average response time between the two conditions is an indicator of relative association strength.[36,40] For the *Race Attitude IAT*, images of faces were used to represent the target concept of *Black American* and *White American,* and words that represent the value concept of ***good vs. bad*** are used for the second category. Words used to represent ***good*** were: *Joy, Love, Peace, Wonderful, Pleasure, Glorious, Laughter,*

Happy. Words used to represent ***bad*** were: *Agony, Terrible, Horrible, Nasty, Evil, Awful, Failure, Hurt*. Standard IAT procedure, reliability, and validity have been previously reported in the literature in detail.[40]

Explicit measure. The explicit measure is a semantic differential measure of attitude that is designed to parallel the target concepts in the IAT. This method to obtain self-reported attitudes is routinely incorporated into Implicit Association Tests.[36] Black American and White American anchor either end of the five-point Likert-type scale, with incremental difference of attitude filling out the scale. The primary question, for the present purpose, was, "What best describes you?" with responses presented on a five point scale; "I (strongly) (moderately) prefer White Americans to African Americans" to, "I like White Americans and African Americans equally" to "I (moderately) (strongly) prefer African Americans to White Americans."

Analytic approach. We used descriptive statistics (means, standard deviations, and frequencies), to characterize the physician sample. For the explicit measure we coded the five-point response scale to range from −2 to +2, with zero indicating no relative preference for White Americans over Black Americans and calculated an explicit measure mean. For this study, an explicit measure mean that differs positively from zero indicates an explicit preference for White Americans over Black Americans. We compared means for the implicit and explicit measures for the complete sample of test takers, for the MD sub-sample, and for the MD sub-sample disaggregated by MD race/ethnicity and by MD race/ethnicity and gender.

The IAT effect is calculated as the standardized difference in mean response time on two key conditions of the IAT, known as the IAT D score.[54] The IAT D score ranges from −2 to +2, with zero indicating no relative preference between White Americans and Black Americans. For this study, an IAT D score that differs positively from zero indicates that it was easier and that, therefore, the response was faster to *White American* and *good* than to *Black American* and *good,* reflecting some degree of implicit preference for Whites. Because IAT results for large samples of test takers are usually statistically significant, meaningful interpretation of IAT results often focuses on effect size. Cohen's d', a standardized effect size measure, was calculated for each of the implicit and explicit measures for each group. Cohen's d' is interpreted as d' of 0.20 = small effect, d' of 0.5 = medium effect, and d' of 0.80 = large effect.[55] Pearson's correlation coefficient *(r)* was used to characterize the relationship between implicit and explicit measures.

Results

Test takers' characteristics. As a group, the medical doctors (MD) sub-sample had demographic characteristics somewhat different from those of the complete sample as well as from those of others with doctoral degrees. The MDs were older, fewer were residents of the U.S., and more were male than in any other group (Table 1). The majority of all test takers were White. Within the MD sample, less than half of the African American MDs were male, compared with other racial/ethnic groups in which males were the majority. The mean age was higher for MDs than for the complete sample, but similar for others with a doctoral degree.

Table 1.

CHARACTERISTICS OF IAT (IMPLICIT ASSOCIATION TEST) SAMPLE[a]

	N	% male sex	Mean age	% reside in U.S.
All test takers	344,469	43	27	86
MD (medical doctor)	2,535	62	37	76
JD (lawyer)	6,144	56	35	91
PhD (doctorate)	7,952	55	41	87
Sample race/ethnicity	**N (%)**	**% male sex**	**Mean age**	**% reside in U.S.**
All test takers				
White	238,791 (69)	44	28	89
African American	30,478 (9)	35	29	91
Asian	18,480 (5)	46	24	66
Hispanic	18,900 (5)	42	25	78
MDs				
White	1,672 (66)	64	39	79
African American	206 (8)	46	38	89
Asian	288 (11)	64	32	74
Hispanic	115 (5)	57	35	61

[a]Percentages do not add to 100 because although other race/ethnicities were reported we restricted the analysis to race/ethnicity shown because the number of MDs in the other categories were too small to include in the analysis.

We compared the IAT test takers who self-identified as MDs with other MDs using the most recent U.S. physician population statistics (2004) from the American Medical Association (AMA). The AMA data on the race/ethnicity characteristics of U.S. physicians are incomplete, which limits our ability to compare our sample with MD population statistics.[56] However, of the 64% of physicians in the AMA database who report race and ethnicity, 74.8% are White, 3.7% Black, 12.9% Asian, 5.0% Hispanic, and 3.6% Other; in our MD sample, 66.4% were White, 8.1% Black, 11.3% Asian, 4.5% Hispanic, and 8.6% Other. The AMA reports the U.S. physician population sex characteristics as 74% male, compared with our sample, which was 62% male.[56]

Implicit attitudes measure by MD race and ethnicity. We found a strong implicit preference for White Americans over Black Americans among all test takers (mean [*M*] = 0.35, standard deviation [SD] = 0.42, d'=0.81) and for the MD sub-sample (*M*=0.39, SD=0.47, d'=0.89) (Table 2). Other sub-groups with a doctoral education also showed an implicit preference for White Americans over Black Americans (lawyers [JD], *M*=0.32, SD=0.43, d'=0.68; doctorates [PhD], *M*=0.32, SD=0.45,

$d'=0.70$). When disaggregated by MD race/ethnicity, implicit preference for White Americans was strong among all MD groups except for African American MDs (Table 3). White MDs showed the strongest implicit preference for Whites ($M=0.44$, SD=0.42, $d'=1.05$). African American MDs, on average, did not show an implicit preference for either White Americans or Black Americans ($M=0.05$, SD=0.47, $d'=0.11$), though the standard deviation indicates that some held an implicit preference for Whites and others held an implicit preference for Blacks. The result for African American MDs is consistent with results for all African Americans who took the *Race Attitude IAT* ($M=-0.03$, SD=0.45, $d'=0.07$), and for African American JDs ($M=-0.03$, SD=0.49, $d'=0.06$) and African American PhDs ($M=-0.02$, SD=0.49, $d'=0.04$) (not shown in tables). More information about IAT results for large samples of test takers has been previously reported.[41]

Implicit attitudes measured by MD gender. For the complete sample of test takers, implicit preference for White Americans was strong among males ($M=0.39$, SD=0.43, $d'=0.91$) and weaker but still substantial among females ($M=0.32$, SD=0.43, $d'=0.74$) (Table 4). Similarly, for the MD sub-sample, strength of implicit preference for White Americans was strong among males ($M=0.45$, SD=0.43, $d'=1.05$) and weaker among females ($M=0.30$, SD=0.45, $d'=0.67$). This gender pattern was found for JDs and PhDs (not shown). When the MD sub-sample was disaggregated by MD race/ethnicity and gender, females in all groups showed weaker implicit preference for White Americans vs. Black Americans than did males. Strength of implicit preference for White Americans was weak among male African American MDs ($M=0.12$, SD=0.50, $d'=0.24$); among female African American MDs, implicit preference for either Whites or Blacks was absent (M=0, SD=0.43).

Self-reported measures. Among all groups of test takers, with the exception of African American MDs, effect sizes for the explicit attitude measure were approximately half as large as for the implicit measures (Table 3). Hispanic MDs reported a relatively weak preference for White Americans over Black Americans, despite strong implicit attitudes that favored White Americans. For African American MDs the explicit measure was negative, showing a strong preference for African Americans relative to White Americans ($M=-0.75$, SD=0.82, $d'=0.91$). When the MD sub-sample was disaggregated by MD race/ethnicity and gender, female MDs in all sub-groups showed weaker explicit attitudes favoring Whites than male MDs showed (Table 4). Both female and male African American MDs reported explicit attitudes that favored Black Americans ($M=-0.87$, SD=0.77, $d'=1.12$ and $M=-0.63$, SD=0.85, $d'=0.42$), respectively. Among Hispanic MDs, females on average, reported no explicit race bias ($M=0$, SD=0.58) although there was variation and males reported a moderate preference for White Americans vs. Black Americans ($M=0.39$, SD=0.66, $d'=0.59$).

Relationship between implicit and explicit measures. Implicit and explicit measures for all test takers and for the MD sub-sample were statistically significant but modestly related, suggesting that implicit and explicit attitudes are related but distinct areas of cognition (Table 5). This finding is consistent with prior research in social cognition.[35]

Table 2.

IMPLICIT AND EXPLICIT ATTITUDE MEASURES: ALL TEST TAKERS, MD, OTHERS WITH DOCTORAL DEGREE

Race Implicit Association Test (IAT)	Effect size[c]				Explicit (self report)	Effect size[c]			
	N	Mean[a,b]	Standard	Cohen's D[b]		N	Mean[a,b]	Standard	Cohen's D[b]
All test takers	344,469	0.35	0.42	0.81	All test takers	404,277	0.24	0.61	0.33
MD (medical doctor)	2,535	0.39	0.47	0.89	MD	2,493	0.28	0.82	0.40
JD (lawyer)	6,144	0.32	0.43	0.68	JD	6,070	0.19	0.66	0.25
PhD (doctorate)	7,952	0.32	0.45	0.70	PhD	7,838	0.23	0.67	0.32

[a]Implicit and explicit measures range from −2 to +2, with zero indicating no bias

[b]A positive mean indicates some degree of automatic preference for white Americans, a negative mean indicates some degree of automatic preference for black Americans

[c]Effect size: Cohen's D is a standardized effect size, comparing the mean to M=0 (no bias), interpreted as; D of 0.2 = small effect, D of 0.5 = medium effect, and D of 0.8 = large effect

Table 3.

IMPLICIT AND EXPLICIT ATTITUDE MEASURES BY MD RACE/ETHNICITY

Race Implicit Association Test (IAT)			Effect size[c]		Explicit (self report)			Effect size[c]	
MD race/ethnicity	**N**	**Mean[a]**	**Standard**	**Cohen's D[b]**	**MD race/ethnicity**	**N**	**Mean[a,b]**	**Standard**	**Cohen's D[b]**
White	1682	0.44	0.42	1.05	White	1915	0.42	0.61	0.69
African American	206	0.05	0.47	0.11	African American	244	– 0.75	0.82	0.91
Asian	288	0.40	0.43	0.93	Asian	346	0.34	0.66	0.52
Hispanic	115	0.40	0.45	0.89	Hispanic	131	0.22	0.67	0.33

[a]Implicit and explicit measures range from −2 to +2, with zero indicating no bias
[b]A positive mean indicates some degree of automatic preference for white Americans, a negative mean indicates some degree of automatic preference for Black Americans
[c]Effect size: Cohen's D is a standardized effect size, comparing the means to M=0 (no bias), interpreted as; D of 0.2 = small effect, D of 0.5 = medium effect, and D of 0.8 = large effect
MD = medical doctor

Table 4.

MD IMPLICIT AND EXPLICIT ATTITUDE MEASURES BY GENDER: ALL TEST TAKERS AND MD TEST TAKERS BY RACE/ETHNICITY

Race Implicit Association Test (IAT)					Explicit (self report)				
	N	Mean[a]	Standard[b]	Cohen's D[c]		N	Mean[a]	Standard[b]	Cohen's D[c]
All test takers					All test takers				
Male	148,425	0.39	0.43	0.91	Male	177,598	0.34	0.75	0.45
Female	196,044	0.32	0.43	0.74	Female	226,679	0.16	0.71	0.23
MD test takers					MD test takers				
Male	1,566	0.45	0.43	1.05	Male	1,822	0.37	0.70	0.56
Female	955	0.30	0.45	0.67	Female	1,078	0.14	0.72	0.19
MD (medical doctor) race/ethnicity					**MD race/ethnicity**				
White					White				
Male	1,076	0.49	0.42	1.17	Male	1,251	0.48	0.62	0.77
Female	596	0.35	0.42	0.83	Female	645	0.30	0.56	0.53
African American					African American				
Male	100	0.12	0.50	0.24	Male	116	0.63	0.85	0.42
Female	106	0.00	0.43	0	Female	128	−0.87	0.77	1.13
Asian					Asian				
Male	184	0.44	0.40	1.10	Male	220	0.36	0.67	0.55
Female	104	0.33	0.43	0.70	Female	184	0.30	0.62	0.48
Hispanic					Hispanic				
Male	64	0.42	0.45	0.93	Male	72	0.39	0.66	0.59
Female	49	0.37	0.46	0.80	Female	57	0.02	0.58	0.03

[a]Implicit and explicit measures range from −2 to +2, with zero indicating no bias
[b]A positive mean indicates some degree of preference for white Americans, a negative mean indicates preference for Black Americans
[c]Effect size: Cohen's D is a standardized effect size, comparing the means to M=0 (no bias), interpreted as; D of 0.2 = small effect, D of 0.5 = medium effect, and D of 0.8 = large effect

Table 5.

CORRELATION BETWEEN IMPLICIT AND EXPLICIT ATTITUDE MEASURES

Implicit/explicit attitude correlation	N	R	P-value
Total sample	349,327	.30	<0.0001
MD (medical doctor)	2493	.30	<0.0001
JD (lawyer)	6070	.30	<0.0001
PhD	7838	.26	<0.0001
MD by race/ethnicity			
White	1651	.21	<0.0001
African American	202	.20	0.004
Hispanic	114	.24	0.01
Asian	287	.22	0.0001

N = total test takers for whom we have both implicit and explicit measures
R = Pearson's correlation

Discussion

This study is the first research to measure implicit and explicit attitudes about race among a large group of MDs and compare results with a large sample and comparable sub-samples. This research makes several important contributions to scientific knowledge. First, we found that MDs' implicit and explicit attitudes about race follow the same general pattern seen in the very large, heterogeneous public samples; the majority held implicit preferences for Whites over Blacks. This is noteworthy because a meta-analysis of 155 studies yielding IAT-behavior correlations, found that IAT measures of implicit race attitudes predicted prejudice and stereotyping related behaviors and discrimination more accurately than did parallel self-report measures.[39] Second, African American MDs, like large groups of African Americans who take the *Race Attitude IAT*,[41] showed no implicit racial bias, on average, though individuals differ widely in showing pro-White or pro-Black implicit associations. Third, we found a difference in strength of implicit and explicit attitudes about race by gender, with males consistently showing stronger preferences for Whites on both the implicit and explicit measures. Fourth, the MD subgroup, like others in society, demonstrated modestly related implicit and explicit attitudes about race. This weak relationship substantiates the supposition that one may explicitly hold egalitarian beliefs while simultaneously holding implicit attitudes that favor Whites relative to Blacks. Finally, our findings lend additional empirical support to efforts to increase the number of African Americans and women in the field of medicine.

It is plausible that during medical decision-making, even among those with egalitarian values, implicit social attitudes and stereotypes stored in memory may be retrieved

automatically without awareness and may influence medical care, albeit unintentionally. Circumstances such as clinical uncertainty, high work load, physician fatigue and cognitive stress are known to produce errors in medical-decision-making.[57–59] The more complex and uncertain the presentation or the more hurried the decision, the more likely a decision error will occur.[59] The IOM report defined *discrimination in health care* as, "differences in care that result from biases and prejudice, stereotyping, and uncertainty in communication and clinical decision-making."[1, p. 4] Discrimination in health care may be driven by implicit attitudes and stereotypes and may represent one more form of error in medical decision-making.

Experiences of discrimination in health care lead to delay in seeking care, an interruption in continuity of care, non-adherence, mistrust, reduced health status, and avoidance of the health care system.[60–63] In one recent study, after controlling for access to care and health status, perceived discrimination was associated with under-utilization of needed medical care.[64] Perceived discrimination among patients with diabetes is associated with 50% lower probability of receiving a hemoglobin A1c test, foot exam, blood pressure exam.[65] The Seattle and King County (Washington) Department of Public Health conducted a small health care survey in 2001 to examine African Americans' perceptions of discrimination in their health care experiences over the previous 10 years.[66] One third of participants reported perceptions of discrimination in their health care experiences. The most frequent type of discrimination reported was differential treatment that they believed was due to their race (64% of total discrimination events). The most frequent personnel they reported involved in the event were the physician (59%), nurse (38%), and front desk staff (23%). These respondents reported that the discrimination event subsequently caused them to delay or avoid health care services. Our findings suggest that an important area for future research is to investigate the links among provider implicit attitudes about race, patient reports of discrimination, and quality of care.

To our knowledge, our study is the first to show patterns of variation in physicians' implicit attitudes about race by physician gender. Among all groups, including MDs, males showed stronger bias than females by demonstrating a stronger implicit and explicit preference for White Americans than females demonstrated. This trend is found for other social biases such as weight, ability, age and other domains.[41] We do not yet know whether and under what circumstances gender differences in implicit bias affect quality of medical care. Research shows that visits are more participatory for patients of female physicians;[20] patient satisfaction is higher for patients of female physicians;[67] clinical visits are rated as more participatory by patients of female physicians;[68] female physicians have more collaborative relationships with patients, spend more time with their patients, are more likely to discuss social issues, and are more likely to deal with emotional issues of their patients;[69] and that patients report liking female physicians more than male physicians.[70] We speculate that these differences in clinical style by physician gender may be related to differences in implicit attitudes held by females generally, which may affect non-verbal behavior and other dimensions of clinical care. Gaining understanding of the relationship between implicit attitudes, physician gender, and quality of care is an area for further study.

An important limitation of this study is that the sample is not a random, representative

sample of MDs. The sample means and distributions cannot be considered parameter estimates of MDs in general. It is possible that selection effects led us to underestimate or overestimate the presence of implicit biases among MDs. Even so, that we included more than 2,500 MDs suggests that the patterns we identified are widespread. For our study, validity of the socio-demographic information provided by this self-selected group of test takers cannot be verified as it might be in face-to-face interviews or when test takers are recruited from a known population. Some studies suggest that for sensitive topics, Web test takers are more likely to be honest than face-to-face or telephone survey respondents.[71–74] Several studies comparing information provided by Internet responders with that collected by traditional methods found no difference in validity of the data collected.[73,75,76] While there is a slightly higher probability of test takers providing misinformation than in more controlled conditions,[75] this concern is not a factor in the interpretation of large data sets.[40,77] The quality of data collected on the Web is often better than the quality of data gathered using other methods because the human error rate in the data collection process is reduced.[71,74,78] Data collected from *Project Implicit®* has been studied intensively for the past four years and validity of results is comparable to that of similar data collected in controlled laboratory conditions.[54,79]

Health professional education programs may benefit from increasing providers' self-awareness of implicit attitudes about race, and understanding how and in what circumstances these attitudes may affect in clinical care. Designing educational interventions that purposefully target providers' implicit attitudes about race represents a novel, as yet untested, approach to reducing racial and ethnic disparities in health care. Approaches used to change implicit attitudes and stereotypes include motivating the individual to promote a positive self-image, stimulating social desirability, suppression of known prejudices, and promotion of counter stereotypes.[80] Training in inter-group communication, encouraging empathy for those who experience discrimination and fostering a sense of common group identity that transcends race can reduce implicit bias and prejudice.[81,82] All of these approaches can be integrated into all levels of clinical education. Testing of these interventions in applied contexts and measuring their effects on clinical decision-making is an important next step in understanding the source of health care disparities and finding ways to mitigate them.

Future research should examine providers' implicit and explicit attitudes and stereotypes about race in areas of care where racial and ethnic disparities in quality of care persist, such as cardiovascular treatment, referral to transplant lists and diagnostic screening, mental health diagnosis and treatment, HIV treatment, cancer care, and pain management. Understanding the effect of providers' implicit attitudes on the quality of clinical care delivered to minority patients, targeting intervention efforts toward increasing self-awareness of implicit attitudes and modifying providers' implicit attitudes and stereotypes about race offers a renewed optimism for eliminating disparities that arise in clinical care.

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Notes

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