Patient-Centered Communication, Ratings of Care, and Concordance of Patient and Physician Race

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Background: **African-American patients who visit physicians of the same race rate their medical visits as more satisfying and participatory than do those who see physicians of other races. Little research has investigated the communication process in race-concordant and race-discordant medical visits.**

Objectives: **To compare patient–physician communication in race-concordant and race-discordant visits and examine whether communication behaviors explain differences in patient ratings of satisfaction and participatory decision making.**

Design: **Cohort study with follow-up using previsit and postvisit surveys and audiotape analysis.**

Setting: **16 urban primary care practices.**

Patients: **252 adults (142 African-American patients and 110 white patients) receiving care from 31 physicians (of whom 18 were African-American and 13 were white).**

Measurements: **Audiotape measures of patient-centeredness, patient ratings of physicians' participatory decision-making styles, and overall satisfaction.**

Results: **Race-concordant visits were longer (2.15 minutes [95% CI, 0.60 to 3.71]) and had higher ratings of patient positive affect (0.55 point, [95% CI, 0.04 to 1.05]) compared with race-discordant visits. Patients in race-concordant visits were more satisfied and rated their physicians as more participatory (8.42 points [95% CI, 3.23 to 13.60]). Audiotape measures of patient-centered communication behaviors did not explain differences in participatory decision making or satisfaction between race-concordant and race-discordant visits.**

Conclusions: **Race-concordant visits are longer and characterized by more patient positive affect. Previous studies link similar communication findings to continuity of care. The association between race concordance and higher patient ratings of care is independent of patient-centered communication, suggesting that other factors, such as patient and physician attitudes, may mediate the relationship. Until more evidence is available regarding the mechanisms of this relationship and the effectiveness of intercultural communication skills programs, increasing ethnic diversity among physicians may be the most direct strategy to improve health care experiences for members of ethnic minority groups.**

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See editorial comment on pp 952-953.

Compelling evidence demonstrates racial, ethnic, and social disparities in health care in the United States (1–11). African Americans and other ethnic minority patients in race-discordant relationships with their physicians (for example, an African-American patient who visits a white physician) report less involvement in medical decisions, less partnership with physicians, lower levels of trust in physicians, and lower levels of satisfaction with care (12–15). A recent report from the Institute of Medicine on racial and ethnic disparities in health care suggests that various aspects of the patient–physician relationship may contribute to the wide disparities seen in U.S. health care (16). Despite emerging evidence linking interpersonal aspects of care, such as patient–physician communication, to continuity of care and health outcomes (17–22), most studies of disparity have focused on technical aspects of health care, such as receipt of certain tests, procedures, and therapies.

Interpersonal communication is sensitive to race concordance. For instance, The Commonwealth Fund's 2001 Health Care Quality Survey found substantially higher rates of reported difficulties in communication for African-American, Hispanic, and Asian patients than for white patients (23). Especially disturbing were the findings that 15% of African Americans believed that they would receive better care if they were of a different race or ethnicity and that African Americans were almost twice as likely as their white counterparts (16% versus 9%) to report being treated with disrespect during a recent health care visit.

Few studies have directly observed medical communication to determine possible interpersonal pathways through which race concordance between patient and physician affect patient ratings of care. We investigated how race concordance affects patient–physician communication and patient ratings of physicians' participatory decision-making style and visit satisfaction. We hypothesized that race concordance is associated with higher levels of communication behaviors that are considered patient centered, higher patient ratings of physicians' participatory decision making, and higher ratings of patient satisfaction. Furthermore, we hypothesized that elements of patient–physician communication would moderate the relationship between race concordance and patient ratings of care.

METHODS

Study Design and Sample

We conducted a cohort study with follow-up of patients seeing primary care physicians in 16 urban primary care practices. Physicians were recruited from the rosters of group practices serving managed care and fee-for-service patients in the Baltimore and Washington, D.C., metro-

Context

Concordant physician–patient ethnicity is associated with favorable patient ratings of care. Whether communication differs when physician and patient share ethnic background is unknown.

Contribution

The authors audiotaped 252 primary care visits. When both physician and patient were African American or both were white, the visit was about 2 minutes longer and the patient's affect was more positive than when ethnicity differed. However, concordant ethnicity was not associated with communication patterns that the researchers defined as more patient centered than physician centered.

Implications

Patient-centered communication does not appear to explain the favorable ratings of care, longer visits, and positive patient affect that occur when patients see physicians whose ethnic background is similar to their own.

–The Editors

politan area. We specifically targeted practices with a high percentage of African-American physicians and patients. Three of the practices were federally qualified community health centers. After meetings with practice leaders, the principal investigator invited physicians who delivered primary care to patients at least 30 hours per week and who self-reported their race to be African-American or white to participate by letter and follow-up telephone calls. Hispanic and Asian physicians and physicians who were in clinical training were excluded.

Between July 1998 and July 1999, a research assistant recruited patients consecutively from waiting rooms of physicians' offices over 1 to 2 days per physician. The target sample was 10 patients per physician. Patients who were 18 years of age or older, were seeing their physician on recruitment days, and self-defined their race as white or African-American were eligible for the study. Efforts were made to recruit patients who had an established relationship with their physician. The research assistant did not approach patients who appeared too acutely ill or cognitively impaired to participate in the interview.

Data Collection

The study procedures were reviewed and approved by the Johns Hopkins Medical Institutions Institutional Review Board. All participating patients and physicians gave informed consent. They were told that the goal of the study was to learn about how physicians and patients communicate with each other. At the start of each visit, research assistants set up a tape recorder in the physician's office, started the tape, and left the office. Physicians and patients were free to turn the tape off at any time during the encounter.

Before the medical visit, patients completed a 5-minute survey about their health status, as measured with one item from the Medical Outcomes Study Short Form ("In general, how would you rate your health?"[24]) and demographic characteristics (age, gender, race, and educational status). After the medical visit, they completed a survey that included a 3-item rating of the physician's participatory decision-making style (12) and questions about overall satisfaction with the visit and whether the patient would recommend the physician to a friend. Physicians completed a background survey that included questions about demographic characteristics (age, gender, race, specialty, and number of years in practice) and a postvisit survey that included a question about how well they knew each patient.

Study Variables

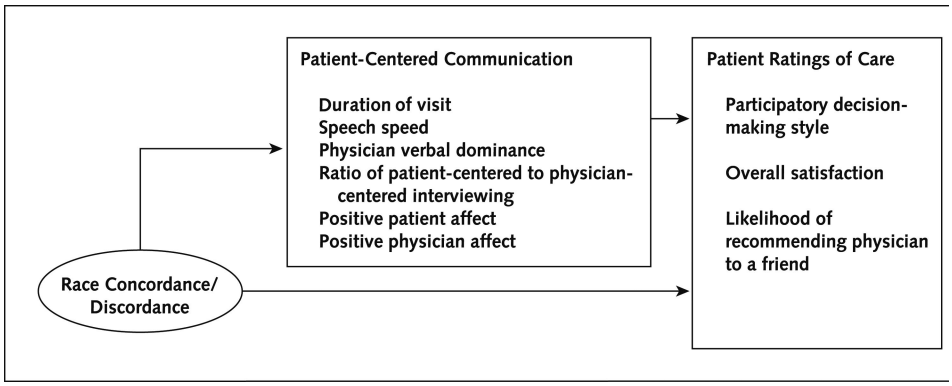
The main independent variable for our analyses was race concordance between African-American and white patients and physicians. The main dependent variables were derived from two sources: audiotaped recordings of medical visits and postvisit patient ratings of the physician's participatory decision-making style and patient satisfaction.

Audiotape Analysis

Audiotapes were analyzed by using the Roter Interaction Analysis System, a widely used coding system with demonstrated reliability and predictive validity in studies of patient–physician communication (25–27). This system assigns each complete thought expressed by the patient and physician to 1 of 37 mutually exclusive and exhaustive codes or categories of communication. These categories can be manipulated to reflect groups of exchange representing 3 recognized functions of the medical interview: data gathering (open and closed biomedical and psychosocial questions), patient education and counseling about biomedical and psychosocial topics, and relationship building through emotionally responsive exchange (empathy, concern, approval, and reassurance) (28). A fourth function of partnership building (seeking patient opinion, asking for understanding, and checking for understanding through paraphrase and interpretation) is also reflected (29).

The **Figure** shows communication elements and ratings of care by patients. The following communication elements were derived for the audiotape analysis: 1) duration of the visit, measured in minutes; 2) speech speed (total number of statements made by patients and physicians per minute); 3) physician verbal dominance (the number of physician statements divided by the number of patient statements); and 4) patient-centered interviewing, which is a ratio of all codes relating to socioemotional and psychosocial elements of exchange (all partnership-building; psychosocial information and counseling; relationship-building; positive, negative, and social talk by physicians and patients; all physician open-ended questions; and all

Figure. **Relations of patient–physician race concordance with patient-centered communication and patient ratings of care.**



patient questions) divided by codes that further the biomedical agenda (the sum of all physician and patient biomedical information and counseling, orientations, and physician closed-ended questions) (27, 30). A value greater than 1 indicates a more patient-centered encounter, and a value less than 1 indicates a more physician-centered encounter.

In addition to categorization of verbal communication, Roter Interaction Analysis System coders were asked to rate the global affect (emotional context) of the dialogue on each audiotape across several dimensions on a numeric scale of 1 to 6, on which 1 represented low or none and 6 was high. Patient positive affect is a composite variable developed by using factor analysis and is the sum of ratings of engagement, interest, friendliness, and responsiveness. Similarly, physician positive affect is a composite variable developed by using factor analysis and is the sum of ratings of interest, friendliness, responsiveness, sympathy, and hurried/rushed. "Hurried/rushed" is reverse coded (that is, a higher score represents a more negative state) because of its negative relationship with the other dimensions. A detailed description of the factor analysis appears in the Appendix, available at www.annals.org. Interitem reliability (Cronbach α) was 0.82 for patient positive affect and 0.88 for physician positive affect.

Two coders who were experienced in using the Roter Interaction Analysis System performed all coding. The coders were white women who were blinded to the study hypotheses. They were not given the race of the patients or physicians, but they may not have been blinded to this information. Reliability was assessed by a 10% random sample of double-coded tapes ($n = 27$) drawn throughout the coding period. Intercoder reliability averaged 0.90 over the physician categories (range, 0.52 to 1.00) and 0.86 over the patient categories (range, 0.45 to 1.00). All reliability coefficients less than 0.70 are in communication categories with low frequency (<1 statement per visit). Coder agreement within 1 point on the patient and physician positive affect scales ranged from 88% to 100%.

Patient Ratings of Care as Measured by Post-Visit Survey

The participatory decision-making style of physicians is defined as the propensity of physicians to involve patients in treatment decisions. It was measured by patient report as the aggregate of 3 items, each rated on a 5-point scale from 0 (never) to 4 (very often): 1) If there were a choice between treatments, how often would this doctor ask you to help make the decision? 2) How often does this doctor give you some control over your treatment? and 3) How often does this doctor ask you to take some of the responsibility for your treatment? The highest possible score is 12. By convention, the raw score is divided by 12 and multiplied by 100 to arrive at a point scale of 0 to 100. A higher score means that the visit was more participatory (12).

Patient satisfaction was measured by using 2 statements for which patients were asked to indicate their level of agreement or disagreement rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree): "Overall, I was satisfied with this visit" and "I would recommend this physician to a friend." On the basis of the distribution of responses, we grouped patients into 1 of 2 categories (1 = "strongly agree" or 0 = "less than strongly agree") for each statement and analyzed them as dichotomous variables.

Statistical Analysis

Linear and logistic regression with generalized estimating equations were used to assess the presence, strength, and statistical associations between race concordance and our dependent variables. The generalized estimating equations method was preferred over traditional regression because it accounts for the clustering effects of any within-physician correlation and the different number of patients per physician (31, 32). We assumed an exchangeable correlation structure because it provides valid and robust estimates even if the correct correlation structure is misspecified. Because odds ratios tend to overstate the probability of frequent events, we present estimated probabilities for logistic regression analyses instead of odds ratios. Adjusted probabilities compare patients in race-concordant versus

race-discordant dyads while holding all covariates in a given model constant at the mean value (for continuous variables) or the average probability of belonging in a particular category (for dichotomous variables) and thus allow comparisons between two otherwise equivalent patients, on the basis of the available data.

Some physicians practiced at more than 1 site, and there were 16 sites with an average of only 2 physicians per site. We therefore accounted for intraclass correlation within physicians rather than within sites. Covariates were identified for the analysis on the basis of theoretical considerations (patient gender) and if they were associated with race concordance and at least 2 of the patient-centered communication indicators at a P value less than 0.10. Multivariate analyses adjusted for patient factors (age, race, gender, and health status) and physician factors (gender and years since completion of training). Because the evidence that gender concordance in the patient–physician relationship matters is inconclusive (13, 33–36) and our analyses showed that gender concordance was not related to race concordance or any of our indicators, it was not included in our models. In addition, our measure of how well the physician knew the patient was related to only one patient-centered communication indicator and not to race concordance; we therefore excluded it from our models.

In separate analyses, we included a term for the interaction between patient race and race concordance to test for possible differences between black–white and white–black discordant pairs and between black–black and white–white concordant pairs in our results. This term was not statistically significant and did not affect our findings. We therefore categorized the patient–physician pairs into two groups for presentation: race concordant and race discordant.

Finally, we performed analyses in which we included only patients with available data for the outcomes and all of the covariates in their respective models. These results were consistent with the results reported in **Tables 2** and **3**.

All analyses were performed by using STATA statistical software, version 7.0 (Stata Corp. College Station, Texas).

Role of the Funding Sources

The study was conducted with grant support from the Commonwealth Fund, the Bayer Institute for Health Care Communication, and the Robert Wood Johnson Foundation. None of the funding agencies had a role in the design, conduct, or reporting of the study.

RESULTS

Recruitment and Sample Characteristics

Of 60 physicians who were invited to participate, 31 agreed to do so (52% response rate). Thirteen physicians were white and 18 were African-American. Physicians who did not participate in our study did not respond to numerous attempts by our research assistant to contact them by telephone, fax, and letter. Nonparticipating physicians did not differ from participating physicians in race, gender, specialty, or year of medical school graduation. Of the physicians we could contact, the most common reason for refusal to participate was that the physician was "too busy."

Three hundred five patients were approached in physician waiting rooms. Of these patients, 10 (3%) declined to participate or were too ill to complete the survey and 11 (4%) were excluded because they reported their race or ethnicity to be other than African-American or white. Thus, 284 patients were eligible. Thirty-two patients (10.5%) had inadequate (poor quality) audiotape data for the main outcomes and were therefore excluded. These patients did not significantly differ from patients in our final sample in terms of age, race, gender, or level of education. Our final sample included 252 African-American and white patients with complete audiotape data (83% completion rate).

The patient sample was 44% white and 56% African American. Age ranged from 18 to 88 years (mean age, 47.5 years). Approximately two thirds of patients were women, and four fifths were high school graduates. One third of the sample reported that they felt their overall health was very good or excellent. Slightly fewer patients were seeing a male (44%) than a female physician (56%) and a white (45%) than an African-American physician (55%). Race-concordant and race-discordant pairs of physicians and patients differed significantly in terms of patient age, gender of the physician, and the average number of years since the physician had completed training (**Table 1**).

Relation of Patient–Physician Race Concordance with Communication Measures

Compared with race-discordant visits, race-concordant visits were longer by about 2.2 minutes (95% CI, 0.60 to 3.71 minutes) and had slower speech speed in the dialogue of both the patient and physician. Race-concordant visits had higher mean ratings of positive patient affect by coders than did race-discordant visits (0.55 point [95% CI, 0.04 to 1.05 points]). Physician positive affect ratings were also higher, but these differences were not statistically significant. Neither the patient-centered interviewing ratio nor physician verbal dominance was related to race concordance (**Table 2**). Analyses adjusting for clinical site yielded similar results.

Relation of Patient–Physician Race Concordance with Patient Ratings of Care

In models that adjusted for patient and physician characteristics, patients in race-concordant visits rated their physicians as more participatory than did patients in race-discordant visits (8.42 points [95% CI, 3.23 to 13.60 points]). Compared with otherwise similar patients in race-discordant visits, patients in race-concordant visits had a higher probability of strongly agreeing with the statements "Overall, I was satisfied with this visit" (0.72 [95% CI, 0.64 to 0.79 versus 0.51 [95% CI, 0.36 to 0.66] for dis-

Table 1. **Characteristics of the Sample, by Patient–Physician Race-Concordant Status***

Characteristic	All Patients (*n* = 252)	Race-Concordant Pairs (*n* = 179)		Race-Discordant Pairs (*n* = 73)		*P* Value†
		White Patient/ White Physician (*n* = 75)	African-American Patient/African-American Physician (*n* = 104)	White Patient/ African-American Physician (*n* = 38)	African-American Patient/White Physician (*n* = 35)	
Age, *n (%)*						
18–44 y	112 (51)	25 (51)	58 (58)	10 (29)	19 (54)	0.002
45–64 y	68 (31)	19 (39)	28 (28)	10 (29)	11 (31)	
≥65 y	39 (18)	5 (10)	14 (14)	15 (43)	5 (14)	
Gender, *n (%)*						
Male	79 (31)	25 (33)	28 (27)	14 (40)	12 (32)	>0.2
Female	173 (69)	50 (67)	76 (73)	21 (60)	26 (68)	
Level of education, *n (%)*						
Less than high school	41 (16)	14 (19)	13 (13)	9 (26)	5 (14)	>0.2
High school graduate	93 (37)	28 (37)	41 (39)	9 (26)	15 (42)	
Some college	69 (28)	21 (28)	31 (30)	7 (21)	10 (28)	
College graduate	46 (18)	12 (16)	19 (18)	9 (26)	6 (17)	
Self-rated health status, *n (%)*						
Poor/fair	65 (26)	17 (23)	27 (26)	10 (29)	11 (29)	>0.2
Good	102 (41)	36 (49)	36 (35)	14 (40)	16 (42)	
Very good/excellent	83 (33)	21 (28)	40 (39)	11 (31)	11 (29)	
How well physician knows patient, *n (%)*						
Very well	79 (44)	32 (48)	29 (46)	8 (38)	10 (36)	>0.2
Somewhat	67 (38)	28 (42)	21 (33)	7 (33)	11 (39)	
Not at all (new patient)	32 (18)	6 (9)	13 (21)	6 (29)	7 (25)	
Physician gender, *n (%)*						
Male	110 (44)	46 (61)	35 (34)	18 (51)	11 (29)	
Female	142 (56)	29 (39)	69 (66)	17 (49)	27 (71)	<0.001
Mean time ± SD since physician completed training, *y*	9.5 ± 8.1	10.8 ± 10.6	9.0 ± 6.1	12.0 ± 7.0	5.7 ± 6.8	0.004

* Some numbers may not add up to the total number of patients because data are missing for certain variables.
† Differences across patient–physician groups were analyzed by using chi-square statistics for categorical variables and analysis of variance for continuous variables.

cordant visits) and "I would recommend this physician to a friend" (0.72 [95% CI, 0.62 to 0.80] versus 0.58 [95% CI, 0.41 to 0.74 for discordant visits]). These differences in patient ratings of care between race-concordant and race-discordant visits were consistent among African-American and white patients. When we controlled for communication behaviors in the visit (model 2), the relationship of race concordance and positive patient ratings of care changed only slightly (**Table 3**).

DISCUSSION

Our study is one of the first to link race concordance between African-American and white physicians and their patients to directly observed medical communication and patient reported evaluations of the visit. We found support for some, but not all, of our hypotheses. Race-concordant visits were characterized by differences in the communication process, but these differences did not affect the relationship between race concordance and patient ratings of care. This suggests that race concordance has an independent effect on patients' judgment of the visit regardless of the verbal nature of the medical dialogue.

Race concordance was related to several aspects of the visit process. Both African-American and white patients in race-concordant encounters with their physicians had visits that were on average 2 minutes (10%) longer than patients in race-discordant encounters, even after adjustment for factors known to be associated with longer patient visits (older age, higher socioeconomic status, and poorer health status). The slower speech speed also reflected a slower pace of exchange within these visits.

Physicians and patients believe that the duration of the visit is important for quality of care (37). Patients report greater ease in discussing problems and making decisions and most are satisfied with the time they have during longer medical visits (38, 39). However, within the context of race, visit duration may have particular salience because several studies report shorter visits and lower satisfaction with time spent in the visit for African-American patients in race-discordant relationships with physicians (40–42). A recent meta-analysis of physician gender and medical communication found that visits with female physicians were 2 minutes longer and characterized by more communication reflective of patient-centeredness and positive affect by both physicians and their patients compared with visits with male physicians (36).

Race-concordant visits also received higher coder ratings of positive affect—reflections of voice tone qualities that are reliable indicators of the emotional context of the visit (43). Similarly, in a Dutch study investigating the association of patient–physician ethnic discordance on communication (which was scored by using the Roter In-

Table 2. **Association between Race Concordance and Measures of Patient-Centered Communication**

Measure of Patient-Centered Communication	Mean Score (95% CI)		*P* Value*
	Race-Concordant Patient–Physician Pairs (*n* = 179)†	Race-Discordant Patient–Physician Pairs (*n* = 73)†	
Duration of visit, *min*			
Unadjusted model	15.35 (13.40 to 17.31)	13.93 (12.35 to 15.51)	0.08
Adjusted model‡	17.54 (11.34 to 23.75)	15.39 (9.22 to 21.56)	0.01
Speech speed, *all talk in the visit/min*§			
Unadjusted model	22.65 (21.15 to 24.15)	23.28 (21.48 to 25.07)	>0.2
Adjusted model‡	18.24 (14.33 to 21.16)	19.21 (15.39 to 23.05)	0.05
Physician verbal dominance‖			
Unadjusted model	1.29 (1.20 to 1.42)	1.29 (1.15 to 1.42)	>0.2
Adjusted model‡	1.17 (0.86 to 3.22)	1.15 (0.76 to 1.53)	>0.2
Patient-centered interviewing score¶			
Unadjusted model	1.30 (1.01 to 1.59)	1.34 (1.01 to 1.68)	>0.2
Adjusted model‡	1.40 (−0.42 to 3.22)	1.29 (−0.49 to 3.07)	>0.2
Patient positive affect			
Unadjusted model	17.16 (16.73 to 17.59)	16.60 (16.05 to 17.15)	0.04
Adjusted model‡	16.38 (15.10 to 17.67)	15.84 (14.31 to 17.37)	0.03
Physician positive affect			
Unadjusted model	12.04 (11.27 to 12.81)	11.55 (10.83 to 12.26)	0.14
Adjusted model‡	13.24 (10.86 to 15.62)	12.72 (10.06 to 15.39)	0.19

* From generalized estimating equations.
† Sample sizes reflect the number of observations included in all of the unadjusted analyses, except in the case of patient-centered interviewing, which includes 72 race-discordant cases; patient positive affect, which includes 177 race-concordant and 72 race-discordant cases; and physician positive affect, which includes 178 race-concordant and 72 race-discordant cases. Adjusted analyses include approximately 22% fewer cases for all outcome variables because of lack of response to the questionnaire (n = 197 for duration of visit, speech speed, and physician verbal dominance; n = 196 for patient-centered interviewing score; n = 194 for patient positive affect; and n = 195 for physician positive affect).
‡ Adjusted for patient demographic characteristics (gender, race, age, and self-rated health status) and physician demographic characteristics (gender and years since completion of training).
§ Computed by summing the total number of patient and physician utterances and dividing by duration of the visit in minutes.
‖ Ratio of the total amount of physician talk to the total amount of patient talk.
¶ Calculated by creating a ratio of the psychosocial and socioemotional talk divided by the biomedical talk during the visit.

teraction Analysis System), ethnic-discordant visits were characterized by less social talk and lower global ratings of physician positive affect (friendliness and concern) than were ethnic-concordant visits (44). The significance of positive affect in race-concordant visits may reflect such factors as mutual liking and respect, a sense of social or racial group affiliation and enhanced trustworthiness, or positive expectations. These attributions are likely to influence both the communication process and patient judgments of the medical visit (45). A meta-analytic review of the correlates of physician communication found that interaction characterized by positive affect was associated with patient satisfaction and adherence, with effect sizes ranging from 0.05 to 0.26 (46). Positive affect within the medical visit (reflected by patient and physician reports of liking one another) is also negatively associated with the likelihood that a patient would change physicians over time (45).

In our study and previous studies (13, 14), race-concordant visits were characterized by higher patient ratings of satisfaction and more positive judgments of physicians' participatory decision-making style. Given that participatory decision making receives average ratings of approximately 75 on a 100-point scale in primary care studies (12, 13) and that a 2-point difference is related to a 10–percentage point difference in the likelihood that a patient would leave a physician's practice in the next 12 months (47), these findings probably have clinical importance.

At least 2 large U.S. studies have also reported that ethnic minority patients perceive less respect and poorer communication in race-discordant relationships with physicians (23, 41). Poor evaluations of ethnic-discordant visits are not limited to the United States. In the Dutch study, patients rated ethnically discordant visits less positively than concordant visits on various dimensions (44).

Communication skills training programs for physicians that emphasize patient-centeredness are an important mechanism by which quality of care for all patients, including those who belong to ethnic minority groups, might be improved (28). However, our findings suggest if these training programs emphasize instrumental behaviors, such as information giving and medication counseling, they may lack a valued affective dimension of interpersonal rapport. Training programs in intercultural communication, which are also recommended by the Institute of Medicine report (16), should probably include a focus on these affective dimensions of communication. Such programs have face validity for improving patient–physician communication in race-discordant relationships, yet little empirical research has been done on their effect on patient outcomes.

Another possibility is that ongoing relationships may ameliorate some portion of the negative effect of race discordance on communication. In a recent study, lower rates of patient disclosure of psychosocial topics to physicians, which were attributed to race discordance, decreased over

time (48). Therefore, policy recommendations that support continuity of care may be especially beneficial to ethnic minority patients in race-discordant relationships.

Our study has several limitations. First, unmeasured patient, physician, or clinical site factors may have affected our findings. Examples include whether patients chose or were assigned to their physicians; patient familiarity with their physician; patient and physician attitudes toward race and preferred communication styles; and site characteristics, such as preestablished limits of time or payer status of patients. Of note, no sites were exclusive in their payment arrangements, and all sites provided care on both a fee-for-service and managed care basis. Second, although we attempted to recruit a random sample of patients on a given day, perhaps more or different information would have been obtained if all the patients of a particular practice were interviewed. Third, we limited the study to office-based primary care physicians in the greater Baltimore and Washington, DC, area who agreed to participate in our study. A comparison of our sample with a statewide random sample of physicians in Maryland indicates that the study physicians were similar in demographic characteristics to African-American and white physicians throughout the region (49). Fourth, we enrolled African-American and white patients and physicians; therefore, our findings may not be generalizable to other racial and ethnic minority groups. Fifth, overall concordance of multiple factors (for example, race or ethnicity, gender, and socioeconomic status) may influence clinical encounters. Use of the term *race* may be problematic in that it probably comprises a combination of biological, cultural, social, and political constructs that are attributed to individual persons. Modern definitions of race may conform more to that of an ethnic group (individuals who share common characteristics related to a culture, language, customs, or values) (50). Finally, additional unmeasured aspects of verbal or nonverbal communication may have been missed. We had limited statistical power to detect differences in speech speed, patient-centered interviewing, and physician positive affect, and for these outcomes, we may have failed to show true differences between race-concordant and race-discordant relationships.

Interpersonal processes during medical visits may exacerbate conditions that contribute to health care disparities. All patients are sensitive to the affective climate of the medical encounter; however, because of historical and personal experiences with discrimination in health care and in the larger society, African-American patients may be especially sensitive to interpersonal cues from their physician that convey a message of caring, trustworthiness, and part-

Table 3. **Association between Race Concordance and Measures of Patient Participation and Satisfaction**

Patient Rating of Care	Mean Score (95% CI)		Estimated Probability (95% CI)*		*P* Value†
	Race-Concordant Patient–Physician Pairs (n = 177)	Race-Discordant Patient–Physician Pairs (n = 73)‡	Race-Concordant Patient–Physician Pairs (n = 177)	Race-Discordant Patient–Physician Pairs (n = 73)‡	
Participatory decision-making style§					
Unadjusted model	79.63 (77.15–82.11)	74.75 (68.53–80.97)	–	–	0.09
Model 1‖	84.97 (73.60–96.35)	76.56 (64.97–88.14)	–	–	<0.001
Model 2¶	76.14 (48.60–103.69)	67.84 (42.46–93.21)	–	–	0.01
Global satisfaction rating**					
Unadjusted model			0.68 (0.59–0.77)	0.48 (0.34–0.62)	<0.01
Model 1‖			0.72 (0.64–0.79)	0.51 (0.36–0.66)	<0.01
Model 2¶			0.73 (0.65–0.79)	0.51 (0.36–0.67)	<0.01
Recommendation of physician to a friend††					
Unadjusted model			0.67 (0.58–0.76)	0.55 (0.40–0.69)	0.09
Model 1‖			0.72 (0.62–0.80)	0.58 (0.41–0.74)	0.04
Model 2¶			0.73 (0.64–0.80)	0.57 (0.38–0.73)	0.03

* Estimated probability reflects the likelihood that the respondents in each category answered "strongly agree" rather than "less than strongly agree" on the survey item indicated. Adjusted estimates are presented for the whole sample and separately for white and African-American patients in race-concordant and race-discordant relationships, after controlling for all covariates included in each model.

† From generalized estimating equations.

‡ Sample sizes reflect the number of observations included in the unadjusted analyses for global satisfaction rating (recommendation of physician to a friend includes 175 race-concordant cases and participatory decision-making score includes 130 race-concordant cases and 60 race-discordant cases). Adjusted analyses include approximately 22% fewer cases in model 1 and 23% fewer cases in model 2 for all outcome variables because of questionnaire nonresponse (n = 147 for model 1 and 145 for model 2 for participatory decision-making score; n = 195 for model 1 and 192 for model 2 for global satisfaction rating; and n = 194 for model 1 and 191 for model 2 for recommendation of physician to a friend).

§ Measured by using patient ratings of the physician's likelihood of giving the patient choice, control, and responsibility in decision making and scored on a scale of 0 to 100.

‖ Adjusted for patient demographic characteristics (age, gender, health status, and race) and physician demographic characteristics (gender and years since completion of training).

¶ Adjusted for patient demographic characteristics, physician demographic characteristics, and medical visit communication characteristics (patient positive affect, duration of visit, and patient-centered interviewing score).

** A dichotomous measure derived from the following item on the patient questionnaire: "Overall, I was satisfied with this visit." Answers were rated by patients on the following scale: 5 = strongly agree, 4 = agree, 3 = neither agree nor disagree, 2 = disagree, 1 = strongly disagree. On the basis of the distribution of responses, the item was recoded into 2 categories for logistic regression as 1 = strongly agree and 0 = less than strongly agree.

†† A dichotomous measure derived from the following question on the patient questionnaire: "I would recommend this physician to a friend." Answers were rated by patients on the following scale: 5 = strongly agree, 4 = agree, 3 = neither agree nor disagree, 2 = disagree, 1 = strongly disagree. On the basis of the distribution of responses, the item was recoded into 2 categories for logistic regression: 1 = strongly agree and 0 = less than strongly agree.

nership (51–54). Well-designed, randomized, controlled trials that test the effectiveness of intercultural communication interventions for health professionals are needed, but our findings suggest that more explanatory research is also needed. Studies that attempt to disentangle the complex pathway through which race concordance may moderate interpersonal exchange, medical decision making, and patient outcomes may demand innovative qualitative and quantitative approaches (10, 55–57). Until further evidence is available, the recommendation of the Institute of Medicine (16) to increase the proportion of underrepresented racial and ethnic minorities among health professionals in the United States may be the most direct strategy to improve health care experiences for ethnic minorities.

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References

1. **Blendon RJ, Aiken LH, Freeman HE, Corey CR.** Access to medical care for black and white Americans. A matter of continuing concern. JAMA. 1989;261:278-81. [PMID: 2909026]

2. **Wenneker MB, Epstein AM.** Racial inequalities in the use of procedures for patients with ischemic heart disease in Massachusetts. JAMA. 1989;261:253-7. [PMID: 2521191]

3. **Escarce JJ, Epstein KR, Colby DC, Schwartz JS.** Racial differences in the elderly's use of medical procedures and diagnostic tests. Am J Public Health. 1993;83:948-54. [PMID: 8328615]

4. **Ayanian JZ, Udvarhelyi IS, Gatsonis CA, Pashos CL, Epstein AM.** Racial differences in the use of revascularization procedures after coronary angiography. JAMA. 1993;269:2642-6. [PMID: 8487447]

5. **Ford E, Cooper R, Castaner A, Simmons B, Mar M.** Coronary arteriography and coronary bypass survey among whites and other racial groups relative to hospital-based incidence rates for coronary artery disease: findings from NHDS. Am J Public Health. 1989;79:437-40. [PMID: 2784635]

6. **Whittle J, Conigliaro J, Good CB, Lofgren RP.** Racial differences in the use of invasive cardiovascular procedures in the Department of Veterans Affairs medical system. N Engl J Med. 1993;329:621-7. [PMID: 8341338]

7. **Lee AJ, Gehlbach S, Hosmer, Reti M, Baker CS.** Medicare treatment differences for blacks and whites. Med Care. 1997;35:1173-89. [PMID: 9413306]

8. **Carlisle DM, Leake BD, Shapiro MF.** Racial and ethnic disparities in the use of cardiovascular procedures: associations with type of health insurance. Am J Public Health. 1997;87:263-7. [PMID: 9103107]

9. **Makuc DM, Breen N, Freid V.** Low income, race, and the use of mammography. Health Serv Res. 1999;34:229-39. [PMID: 10199671]

10. **Schulman KA, Berlin JA, Harless W, Kerner JF, Sistrunk S, Gersh BJ, et al.** The effect of race and sex on physicians' recommendations for cardiac catheterization. N Engl J Med. 1999;340:618-26. [PMID: 10029647]

11. **Andrulis DP.** Access to care is the centerpiece in the elimination of socioeconomic disparities in health. Ann Intern Med. 1998;129:412-6. [PMID: 9735070]

12. **Kaplan SH, Gandek B, Greenfield S, Rogers W, Ware JE.** Patient and visit characteristics related to physicians' participatory decision-making style. Results from the Medical Outcomes Study. Med Care. 1995;33:1176-87. [PMID: 7500658]

13. **Cooper-Patrick L, Gallo JJ, Gonzales JJ, Vu HT, Powe NR, Nelson C, et al.** Race, gender, and partnership in the patient-physician relationship. JAMA. 1999;282:583-9. [PMID: 10450723]

14. **Saha S, Komaromy M, Koepsell TD, Bindman AB.** Patient-physician racial concordance and the perceived quality and use of health care. Arch Intern Med. 1999;159:997-1004. [PMID: 10326942]

15. **Doescher MP, Saver BG, Franks P, Fiscella K.** Racial and ethnic disparities in perceptions of physician style and trust. Arch Fam Med. 2000;9:1156-63. [PMID: 11115223]

16. **Institute of Medicine.** Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care. Washington, DC: National Academy Press; 2003.

17. **Hall JA, Roter DL, Katz NR.** Meta-analysis of correlates of provider behavior in medical encounters. Med Care. 1988;26:657-75. [PMID: 3292851]

18. **Greenfield S, Kaplan SH, Ware JE Jr, Yano EM, Frank HJ.** Patients' participation in medical care: effects on blood sugar control and quality of life in diabetes. J Gen Intern Med. 1988;3:448-57. [PMID: 3049968]

19. **Kaplan SH, Greenfield S, Ware JE Jr.** Assessing the effects of physician-patient interactions on the outcomes of chronic disease. Med Care. 1989;27:S110-27. [PMID: 2646486]

20. **Giron M, Manjon-Arce P, Puerto-Barber J, Sanchez-Garcia E, Gomez-Beneyto M.** Clinical interview skills and identification of emotional disorders in primary care. Am J Psychiatry. 1998;155:530-5. [PMID: 9546000]

21. **Stewart MA.** Effective physician-patient communication and health outcomes: a review. CMAJ. 1995;152:1423-33. [PMID: 7728691]

22. **Ware JE Jr, Davies AR.** Behavioral consequences of consumer dissatisfaction with medical care. Eval Program Plann. 1983;6:291-7. [PMID: 10267257]

23. **Collins KS, Hughes DL, Doty MM, Ives BL, Edwards JN, Tenney K.** Diverse Communities, Common Concerns: Assessing Health Care Quality for Minority Americans. Findings from The Commonwealth Fund 2001 Health Care Quality Survey. New York: The Commonwealth Fund; 2002.

24. **Ware J Jr, Kosinski M, Keller SD.** A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. Med Care. 1996;34:220-33. [PMID: 8628042]

25. **Roter DL, Stewart M, Putnam SM, Lipkin M Jr, Stiles W, Inui TS.** Communication patterns of primary care physicians. JAMA. 1997;277:350-6. [PMID: 9002500]

26. **Roter DL, Larson S.** The relationship between residents' and attending physicians' communication during primary care visits: an illustrative use of the Roter Interaction Analysis System. Health Commun. 2001;13:33-48. [PMID: 11370921]

27. **Roter D, McNeilis KS.** The nature of the therapeutic relationship and the assessment of its discourse in routine medical visits. In: Thompson TL, Dorsey AM, Miller KI, Parrott R, eds. Handbook of Health Communication. Mahwah, NJ: Lawrence Erlbaum Associates, 2003;121-40.

28. **Lazare A, Putnam SM, Lipkin M Jr.** Three functions of the medical inter-

view. In: Lipkin M, Putnam S, Lazare A, eds. The Medical Interview: Clinical Care, Education, and Research. New York: Springer-Verlag; 1995:3-19.

29. **Roter D.** The medical visit context of treatment decision-making and the therapeutic relationship. Health Expect. 2000;3:17-25. [PMID: 11281908]

30. **Mead N, Bower P.** Measuring patient-centredness: a comparison of three observation-based instruments. Patient Educ Couns. 2000;39:71-80. [PMID: 11013549]

31. **Zeger SL, Liang KY.** Longitudinal data analysis for discrete and continuous outcomes. Biometrics. 1986;42:121-30. [PMID: 3719049]

32. **Liang K-Y, Zeger SL.** Longitudinal data analysis using generalized linear models. Biometrika. 1986;73:13-22.

33. **Roter DL, Geller G, Bernhardt BA, Larson SM, Doksum T.** Effects of obstetrician gender on communication and patient satisfaction. Obstet Gynecol. 1999;93:635-41. [PMID: 10912958]

34. **Derose KP, Hays RD, McCaffrey DF, Baker DW.** Does physician gender affect satisfaction of men and women visiting the emergency department? J Gen Intern Med. 2001;16:218-26. [PMID: 11318922]

35. **Schmittdiel J, Grumbach K, Selby JV, Quesenberry CP Jr.** Effect of physician and patient gender concordance on patient satisfaction and preventive care practices. J Gen Intern Med. 2000;15:761-9. [PMID: 11119167]

36. **Roter DL, Hall JA, Aoki Y.** Physician gender effects in medical communication: a meta-analytic review. JAMA. 2002;288:756-64. [PMID: 12169083]

37. **Wiggers JH, Sanson-Fisher R.** Duration of general practice consultations: association with patient occupational and educational status. Soc Sci Med. 1997; 44:925-34. [PMID: 9089915]

38. **Howie JG, Porter AM, Heaney DJ, Hopton JL.** Long to short consultation ratio: a proxy measure of quality of care for general practice. Br J Gen Pract. 1991;41:48-54. [PMID: 2031735]

39. **Morrell DC, Evans ME, Morris RW, Roland MO.** The "five minute" consultation: effect of time constraint on clinical content and patient satisfaction. Br Med J Clin Res Ed. 1986;292:870-3. [PMID: 3083919]

40. **Rosenheck R, Fontana A, Cottrol C.** Effect of clinician-veteran racial pairing in the treatment of posttraumatic stress disorder. Am J Psychiatry. 1995;152:555-63. [PMID: 7694904]

41. **Malat J.** Social distance and patients' rating of healthcare providers. J Health Soc Behav. 2001;42:360-72. [PMID: 11831137]

42. **Gross DA, Zyzanski SJ, Borawski EA, Cebul RD, Stange KC.** Patient satisfaction with time spent with their physician. J Fam Pract. 1998;47:133-7. [PMID: 9722801]

43. **Hall JA, Roter DL, Rand CS.** Communication of affect between patient and physician. J Health Soc Behav. 1981;22:18-30. [PMID: 7240703]

44. **van Wieringen JC, Harmsen JA, Bruijnzeels MA.** Intercultural communication in general practice. Eur J Public Health. 2002;12:63-8. [PMID: 11968523]

45. **Hall JA, Horgan TG, Stein TS, Roter DL.** Liking in the physician–patient relationship. Patient Educ Couns. 2002;48:69-77. [PMID: 12220752]

46. **Hall JA, Roter DL, Katz NR.** Meta-analysis of correlates of provider behavior in medical encounters. Med Care. 1988;26:657-75. [PMID: 3292851]

47. **Kaplan SH, Greenfield S, Gandek B, Rogers WH, Ware JE Jr.** Characteristics of physicians with participatory decision-making styles. Ann Intern Med. 1996;124:497-504. [PMID: 8602709]

48. **Wissow LS, Larson SM, Roter D, Wang MC, Hwang WT, Luo X, et al.** Longitudinal care improves disclosure of psychosocial information. Arch Pediatr Adolesc Med. 2003;157:419-24. [PMID: 12742876]

49. The Maryland Study on Physician Experience with Managed Care. Center for Health Program Development and Management, Baltimore: University of Maryland Baltimore County; 2001.

50. Census, race and science [Editorial]. Nat Genet. 2000;24:97-8. [PMID: 10655044]

51. **Krieger N, Sidney S.** Racial discrimination and blood pressure: the CARDIA Study of young black and white adults. Am J Public Health. 1996;86:1370-8. [PMID: 8876504]

52. **LaVeist TA, Nickerson KJ, Bowie JV.** Attitudes about racism, medical mistrust, and satisfaction with care among African American and white cardiac patients. Med Care Res Rev. 2000;57 Suppl 1:146-61. [PMID: 11092161]

53. **Gamble VN.** A legacy of distrust: African Americans and medical research. Am J Prev Med. 1993;9:35-8. [PMID: 8123285]

54. **van Ryn M, Burke J.** The effect of patient race and socio-economic status on physicians' perceptions of patients. Soc Sci Med. 2000;50:813-28. [PMID: 10695979]

55. **McKinlay JB, Lin T, Freund K, Moskowitz M.** The unexpected influence of physician attributes on clinical decisions: results of an experiment. J Health Soc Behav. 2002;43:92-106. [PMID: 11949199]

56. **Roter D, Hall J, Katz N.** Relations between physicians' behaviors and patients' satisfaction, recall, and impressions: an analogue study. Med Care. 1987; 25:399-412.

57. **Fogarty LA, Curbow BA, Wingard JR, McDonnell K, Somerfield MR.** Can 40 seconds of compassion reduce patient anxiety? J Clin Oncol. 1999;17:371-9. [PMID: 10458256]

Appendix: Factor Analysis Methods for Developing Affect Rating Composites in the Roter Interaction Analysis System

Physician and Patient Global Affect Ratings

In addition to coding the utterances in each visit according to the Roter Interaction Analysis System categories, coders are asked to give an overall rating for each tape across several affect dimensions: anger/irritation, anxiety/nervousness, dominance/assertiveness, interest/attentiveness, friendliness/warmth, responsiveness/engagement, and sympathetic/empathetic. Coders assign numeric scores to both the patient and the physician across the 7 affect dimensions. In addition, patients are coded for depression/sadness and emotional distress/upset, and physicians are coded for the degree to which they appear hurried/rushed during the visit. All affect dimensions are coded on a numeric scale of 1 (low or none) or 6 (high). Ratings of anger/irritation, anxiety/nervousness, depression/sadness, and emotional distress/upset are given a score of 1 when absent, whereas for ratings across the other 6 dimensions, values of 3 or 4 are considered average and extreme scores are given for visits that appear markedly lower or higher than average on these dimensions.

Exploratory Analysis

Descriptive statistics were calculated initially on all individual affect ratings for patients and physicians to determine the amount of variability in ratings across all dimensions. Anger/irritation for patients and physicians was dropped from additional analyses because the variability of ratings was found to be low (SD, 0.17 for patients and 0.06 for physicians). In addition, physician anxiety/nervousness was dropped from future analyses because no variability was seen across all audiotapes (SD, 0).

Factor Analysis

Patient Affect Composites

Principal components factor analysis with varimax rotation was performed on the remaining 8 affect dimensions assessed for patients. On the basis of the results, 1 composite was generated to describe patient positive affect. Dominance/assertiveness, interest/attentiveness, friendliness/warmth, responsiveness/engagement, and sympathetic/empathetic all loaded on factor 1 ($\lambda > 0.40$) whereas depression/sadness and emotional distress/upset loaded most strongly on factor 2 ($\lambda > 0.80$). Patient positive affect is a composite variable based on the sum of ratings for the 5 dimensions that loaded on factor 1. The possible scores for patient positive affect range from a minimum of 5 points (very low or below-average levels on all 5 dimensions) to a maximum of 30 points (very high or above-average levels on all 5 dimensions). The mean patient positive affect score for this sample is 17.05 (SD, 2.15).

Physician Affect Composite

Principal components factor analysis with varimax rotation was performed on the 6 remaining dimensions for physician affect, once anger/irritation and anxiety/nervousness were excluded. Interest/attentiveness, friendliness/warmth, responsiveness/engagement, sympathetic/empathetic, and hurried/rushed loaded most heavily on factor 1 ($\lambda > 0.70$), whereas only dominance/assertiveness loaded most strongly on factor 2 ($\lambda = 0.97$). Thus, since all dimensions on factor 1 except for hurried/rushed indicated positive affect dimensions, hurried/rushed ($\lambda = -0.71$) was subtracted from the sum of the other four dimensions of factor 1 to generate a composite variable indicating physician positive affect. The possible scores range from a minimum of -2 points (indicating that the physician is very hurried and very low on all 4 positive components of physician affect) to a maximum of 23 (indicating that the physician is not at all hurried and very high on all 4 positive components of physician affect). The mean physician positive affect score for this sample is 12.02 (SD, 2.94).

Intercoder Reliability

Coder agreement within 1 point on the positive affect scales ranged from 88% to 100% for both patient and physician. Agreement on patient positive affect included 96% for responsiveness and interest and 93% for friendliness, and agreement on physician positive affect included 88% agreement for responsiveness, interest, and sympathy; 93% for friendliness; and 96% for hurried/rushed. Interitem reliability (Cronbach α) was 0.82 for the patient positive affect scale and 0.88 for the physician positive affect scale.

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