# Physician Communication Behaviors and Trust among Black and White Patients with Hypertension

**Kimberly D. Martin, PhD**[a], **Debra L. Roter, DrPH**[b], **Mary Catherine Beach, MD, MPH**[a,b,c], **Kathryn A. Carson, ScM**[c,d], and **Lisa A. Cooper, MD, MPH**[a,b,c,d,e]

[a]Division of General Internal Medicine, Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD

[b]Department of Health Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD

[c]Welch Center for Prevention, Epidemiology, and Clinical Research, Johns Hopkins University, Baltimore, MD

[d]Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD

[e]Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD

## Abstract

**Background**—Racial differences in patient trust have been observed, but it is unclear which physician communication behaviors are related to trust, and whether the relationship of communication and trust differs among black and white patients.

**Objective**—We sought to determine whether there were associations between physician communication behaviors, visit process measures and patient trust, particularly within racial groups.

**Methods**—Study participants included 39 primary care physicians and 227 black and white hypertensive patients from community-based practices in Baltimore, Maryland. Physician informational and affective communication behaviors and visit process measures were coded from visit audiotapes using the Roter Interaction Analysis System. Patient trust was measured using items from the Trust in Physician Scale, and dichotomized (high/low). Logistic regression analysis using generalized estimating equations was used to assess the association of each physician communication behavior and visit process measure with patient trust, among the entire sample and then stratified by patient race.

**Results**—Positive physician affect and longer visits were significantly associated with high patient trust in unadjusted analyses. After adjustment for covariates, positive physician affect remained a significant predictor of high patient trust in the overall sample (OR 1.26; 95%CI 1.08, 1.48; p=0.004) and after stratification by race, among black patients (OR 1.35; 95%CI 1.09, 1.67; p=0.006).

**Conclusion**—Physician communication behaviors may have a varying effect on patient trust, depending on patient race. Communication skills training programs targeting emotion-handling

Corresponding Author: Kimberly Martin, PhD, 2024 E. Monument Street, Suite 2-500, Baltimore, MD 21287, Fax: (410)614-0588, Phone: (410)614-0986, kdmartin@jhmi.edu.

and rapport-building behaviors are promising strategies to reduce disparities in healthcare and to enhance trust among ethnic minority patients.

## Keywords

patient-physician communication; trust; African Americans

## Introduction

While racial and ethnic disparities in health and health care utilization are well-documented[1,2], researchers continue to investigate reasons for these disparities. There is increasing evidence that lower levels of trust in health care providers are related to lower patient satisfaction among minority populations, particularly African Americans[3,4]. As patient trust has been associated with patient satisfaction, treatment adherence, continuity of care and improved health[5–7], further research of factors influencing patient trust may help explain racial differences in trust. This would then identify strategies that may ultimately help to minimize health and health care disparities in this population.

Interpersonal communication between patients and clinicians is of key importance to the delivery of equitable, high quality care. It has also been linked to patient satisfaction[8], adherence to treatment recommendation[9,10], health outcomes[11], and more recently, to racial and ethnic disparities in health care. African American and other ethnic minority patients have been found to receive poorer interpersonal communication, including lower levels of affective behaviors such as rapport-building and overall affective tone, and greater physician verbal dominance, less patient-centeredness, and shorter visits, compared with white patients[12–16]. Race concordance between patients and physicians has been linked with longer visits with more positive patient affect, higher levels of patient trust, greater patient satisfaction and ratings of visits as being more participatory[17–19].

Prior work has shown that certain physician communication behaviors, particularly those that explore and validate the disease and illness experience of the patient and encourage patient involvement in the dialogue, are associated with greater patient trust[5,20–22]. However, it is less clear whether differences in physician communication behaviors explain observed racial differences in patient trust[4,23,24]. Most studies have measured patient perceptions of physician communication[4,5,20,21,23,24], which provide valuable information, but have not objectively assessed physician behavior. One study did use objective assessments, but these were from observing standardized patients rather than the physicians' actual patients[22].

In this sample of patients with hypertension, we examined the association between physician communication behaviors and patient trust, as well as the effect of patient race and race concordance with the physician on this association. We hypothesized that physician affective behaviors would have stronger associations with trust among black patients, while informational behaviors would have stronger associations with trust among whites. Second, we hypothesized that communication process measures would have similar associations with trust among black and white patients. Finally, we hypothesized that physician affective communication behaviors, visit length and speech speed would be more strongly associated with trust in race-discordant relationships, while the associations of informational behaviors, verbal dominance and patient centeredness would be similar in race-discordant and race-concordant relationships.

# Methods

## Study design and population

This was a cross-sectional analysis of baseline data from the Patient-Physician Partnership Study, a randomized controlled trial with a two-by-two factorial design[25,26]. It consisted of patient- and physician- level interventions that focused on enhancing participatory decision-making and were designed to improve patient adherence and blood pressure control among patients with hypertension in Baltimore, Maryland. The study occurred in community-based primary care sites that served primarily low income and/or ethnic minority patient populations. Further details regarding participant enrollment have been described elsewhere[25]. The Johns Hopkins Medicine Institutional Review Board approved this study. Patients and physicians provided written consent prior to inclusion in the study. Fifty physicians and 279 of their adult patients with an ICD-9 diagnosis of hypertension were recruited into the study. After randomization, data was collected at the enrollment visit. Visits were part of ongoing patient care with their primary care physician, and over 75% of patients were well known by the physician[15]. We excluded patients who were not of white or black race (n=5) and those who did not have audiotape (n=43), trust (n=1) or perceived discrimination data (n=3). The current analysis includes 227 black or white patients and the physicians who saw them (n=39).

## Independent Variables

**Communication variables—**The main predictor variables were communication behaviors collected via audiotape recording during the enrollment visit and analyzed with the Roter Interaction Analysis System (RIAS)[27]. RIAS is a widely used method of medical dialogue coding[28] that has established reliability and predictive validity[27,29]. Using RIAS, each complete thought uttered by the patient or physician was placed into 37 mutually exclusive, exhaustive categories of talk. These categories were then combined to form summary variables, which reflect the amount of talk in broader categories. Two experienced raters performed all coding, and rated the overall emotional tone, or affect, of the physicians and patients on several dimensions. Inter-rater reliability on a subset of interviews (n=23) averaged 85% (range 63–96%) agreement for verbal communication codes and 87–100% agreement within one point for global affect ratings.

**Informational behaviors:** We combined physician communication behaviors that involved the exchange of information, such as data gathering and patient education/counseling, into biomedical and psychosocial content categories, which were expressed as frequencies of all physician statements.

**Affective behaviors:** The physician affective communication behaviors of interest included the frequency of rapport-building and partnership building, and the positive physician affect score. Rapport building consisted of positive (e.g., compliments and laughter), emotional (e.g., empathic or concern statements), negative (e.g., criticisms and disagreements) and/or social (e.g., chit chat) talk. Talk related to partnership building included statements that check for understanding through paraphrasing or repetition, or ask for the patient's opinion, permission, or reassurance during the visit. Positive physician affect was calculated by adding the global affect scores, on a scale of 1 to 6, for interest, friendliness, assertiveness, empathy, responsiveness, and hurried (reverse coded).

**Process measures:** Patient centeredness, the ratio of statements relating to psychosocial and socio-emotional exchange (lifestyle/psychosocial information and counseling; physician lifestyle/psychosocial questions; patient questions; emotional talk; partnership building) to traditional biomedical talk (biomedical information and counseling; physician questions;

orientation), was derived from patient and physician communicative behaviors during the visit. A value greater than one indicates that the patient's agenda was pursued to a greater extent than that of the physician. Patient centeredness has been previously linked to patient satisfaction and reported rapport with clinicians[30,31]. We also examined physician verbal dominance (ratio of physician statements to patient statements), which is an indicator of patient engagement in the interview and has been shown to be associated with patient race[14]. A verbal dominance ratio greater than one indicates that the physician contributed more to the visit compared to the patient. Other process measures that were examined include speech speed (the number of statements by patients and physicians per minute) and visit length (in minutes), which have previously been associated with patient-physician race concordance[19].

### Covariates

**Patient level variables:** Patient-level variables were collected at baseline. We examined variables previously associated with patient physician communication and/or patient trust. Demographic variables included patient age, gender, education (dichotomized into high school graduate/not), and race (black/white). General health was measured by an item from the physical component of SF-12 health survey[32], which was administered during the baseline visit and collapsed into three levels (excellent/very good; good; and fair/poor). Blood pressure (BP) was measured in triplicate before patient randomization by trained and certified observers using an automatic oscillometric monitor (Omron HEM 907). BP was defined as the average of all three measurements, then dichotomized as controlled [using the JNC 7 definition of BP control (<140/90 mmHg, or <130/80 mmHg if the patient had diabetes or chronic kidney disease)] or uncontrolled. Prior experience of racial discrimination in health care was assessed with the following question: "Within the past 12 months, when you went to get health care, how do you feel you have been treated compared to people of other races?" Responses were collapsed into two levels: worse/not sure and better/same). Patient intervention group (intensive or minimal) was included because the initial intervention occurred after the baseline survey but prior to the audiotaped enrollment visit.

**Physician level variables:** Physician gender, age, and number of years in practice were collected at baseline. Physician race/ethnicity was also collected and grouped into four levels (white, black, Hispanic and Asian). The race/ethnicity of the physician was then compared with that of the patient to identify race-concordant and race-discordant groups. Since the physician intervention took place before patient enrollment, physician intervention assignment group (intensive or minimal) was also included.

## Outcome measures

Patient trust was measured immediately after the enrollment visit using items from Trust in Physician scale[33]. Patients were asked to rate their level of agreement with the following five statements: "I trust this doctor to look out for my best interests"; "I have confidence in this doctor's knowledge and skills"; "I trust this doctor to tell the truth about my health"; "I trust this doctor to keep what I tell him or her confidential"; and "I trust this doctor to put my medical needs above all other considerations." The responses were "not at all", "a little", "somewhat", "mostly" and "completely". Patients were coded as having high trust if they responded "completely" on all answered items.

## Statistical Analysis

Bivariate comparisons between study variables and patient race were performed. Comparisons of categorical variables were conducted using chi-square tests, and those of continuous variables were conducted using two-sample t-tests, or Wilcoxon rank-sum tests

for non-normally distributed values. The associations between informational and affective behaviors, process measures and patient trust were assessed in unadjusted and adjusted analyses, overall and stratified by patient race, and in secondary analyses, stratified by race concordance. We performed separate logistic regression analyses using generalized estimating equations (GEE) to determine whether each set of physician communication behaviors was an independent predictor of high patient trust, adjusting for patient race, age, general health, discrimination, physician race concordance with patient, and physician and patient intervention groups, and accounting for nesting of patients within physician. Model covariates were selected based on bivariate associations (at $p<0.1$) with patient trust and/or physician communication behaviors, or for theoretical considerations (intervention group). Selected models also included an additional covariate that was strongly related to only one communication behavior in bivariate associations ($p<0.05$), such that models with positive physician affect were adjusted for physician gender, while models with speech speed included adjustment for patient education and models with verbal dominance included adjustment for patient gender. Models with visit length included adjustment for BP control. We also formally tested patient race as an effect modifier by including interaction terms in each model. All analyses were conducted using SAS version 9.3 (SAS Institute, Inc., Cary, NC, USA).

## Results

A total of 227 patients were included in this analysis. There were no significant differences between the study participants and those excluded due to missing data. Demographic and visit characteristics of the study sample are described in Table 1 and compared by patient race. Black patients were significantly younger than white patients ($p=0.03$) and a lower proportion of black patients had controlled BP ($p=0.01$). The mean physician age was 42.8 years. Participating physicians were in practice for about 11 years, on average. Both black and white patients saw a similar proportion of male physicians in their visits (Table 1), but black patients had a higher proportion of visits with black physicians than did white patients ($p=0.002$).

Table 2 describes communication characteristics of each visit, which includes observed physician informational and affective communication behaviors. There were no significant racial differences in the number of biomedical or psychosocial statements uttered by the physicians. However, during visits with black patients, physicians uttered significantly fewer rapport-building statements compared to those with white patients ($p=0.004$). The number of partnership building statements and the positive physician affect score did not differ significantly by race. Communication process variables are also presented in Table 2. Visits with black patients were significantly shorter ($p<0.001$), and had a significantly higher speech speed ($p=0.03$). In these visits, physicians were also more verbally dominant ($p<0.001$); however, the racial difference in patient centeredness was not statistically significant.

Approximately two-thirds of the study participants had high trust in their physicians. The proportion of black patients with high trust was significantly lower than that of white patients (Table 2). When the odds of having high trust was modeled separately with respect to each measure of communication, positive physician affect and visit length were positive significant predictors in unadjusted analyses (table not shown). Similar patterns of association were found in the models adjusted for patient and physician demographic characteristics (Table 3). In overall and race-stratified models predicting the odds of high patient trust of the physician, a higher number of biomedical and psychosocial statements uttered by the physician was not associated with high patient trust. A higher number of rapport building statements was not associated with high trust in the overall model, and

stratification revealed that the adjusted association between rapport building and high trust among black patients did not reach statistical significance (p=0.07). In the overall model, higher positive physician affect scores were significantly associated with the odds of the patient having high trust in the physician. Among black patients, the odds of having high trust for each unit increase in positive physician affect score was statistically significant and greater than that among white patients. However, added interaction terms for race and informational and affective behaviors were not significant. In secondary analyses (table not shown), the association between positive physician affect and trust [Odds Ratio 1.270; 95% Confidence Interval (0.972, 1.659), p=0.08] for race-concordant visits was not statistically significant. Among race-discordant pairs, there was a significant association between positive physician affect and trust (OR 1.272; 95%CI 1.018, 1.590; p=0.03). However, increased physician psychosocial (p=0.08) and rapport building (p=0.09) statements were not significantly associated with patient trust.

None of the communication process variables was significantly associated with high trust in overall adjusted or race-stratified models. However, longer visits, higher physician verbal dominance and more patient-centered talk tended to increase the odds of high trust, while faster speech tended to decrease the odds of high trust. In each set of race-stratified models, the magnitude of association with trust was similar for speech speed and verbal dominance, but patient centeredness appeared to have a greater effect on patient trust among black patients (Table 3). Added interaction terms for race and each process measure were not significant. In secondary analyses, there was no significant association between any of the process measures and patient trust, for race-concordant or race-discordant pairs.

## Discussion

In this biracial population of patients with hypertension, positive physician affect was significantly associated with higher patient trust in the entire sample and among black patients. This study also confirmed previous findings of lower trust among black compared to white patients[3,4,23,24,34,35] and less patient-centered communication behaviors among black compared to white patients[14,16]. Physician informational behaviors and communication process variables were not significantly associated with patient trust, in models adjusted for patient factors, race concordance, and intervention group status.

Although previous work has not examined the associations between objective measures of physician affective behaviors and patient trust, one study assessed the association between patient perceptions of physician's supportiveness and trust[23]. Also, within the Primary Care Assessment Survey, patient reports of interpersonal treatment and of trust were found to be positively correlated[36]. Neither of these studies examined their findings by patient race, but their overall associations were consistent with our overall model for positive physician affect and patient trust.

An intriguing and somewhat parallel result was found within the context of depression medication management visits conducted by psychiatrists[37]. Psychiatrists' positive affect was associated with appointment keeping adherence for both black and white patients; however, analysis stratified by patient race showed that the appointment keeping rate for blacks at low levels of positive affect was substantially lower (32%) than the rate found at moderate (58%) and high (64%) levels of physician positive affect. For white patients, this difference was far less marked (80% (low) vs. 96% (moderate) and 98% (high)). These findings suggest that positive physician affect may moderate trust and that the consequences for continuance in treatment are stronger for black than for white patients[37].

The effect of race concordance in patient-provider dyads on the association between patient perceptions of provider behavior and trust was also previously examined[23]. This sample did not include black concordant interactions, but patients in discordant visits perceived that their physicians were less supportive compared with patients in white concordant visits, and post-visit trust ratings were lower in black (patient) discordant visits compared with white (patient) discordant and white concordant visits[23]. In our secondary analyses, we observed that positive physician affect was significantly associated with patient trust in race-discordant relationships. Positive physician affect was not significantly associated with patient trust in race-concordant relationships, but the magnitude of the association was similar to that observed in race-discordant relationships.

Our lack of observed associations between physician communication process variables and patient trust is somewhat consistent with prior work. Similar to the analysis of patient trust and patient-centered behaviors of primary care physicians[22], we failed to show a statistically significant association between patient-centeredness with trust; the previous work also failed to show associations between two components of patient-centeredness and trust[22]. Despite this similarity, our findings expand on the prior work where each physician's communication style was measured using a standardized patient and related to trust ratings from patients within his or her practice, whereas we measured communication behaviors in actual patient visits. In addition, our sample of black and white patients enabled us to assess race-specific differences in the association between physician communication behaviors and trust.

Our findings regarding informational and partnership behaviors differ from those of previous work[23,24], in which patient ratings of physician informational behaviors[23,24] and partnering[23] were related to trust, and in one study, a stronger association was observed among black patients[24]. These findings might differ for several reasons, including differences in study sample composition or in the measurement and analysis of communication data. In sensitivity analyses, we found no association between physician biomedical or psychosocial information giving behaviors and trust.

Perceived discrimination and its relationship to racial/ethnic health disparities have been well documented[38], although the mechanism by which they are related is poorly understood[39]. As expected, prior discrimination was strongly associated with trust[40], and unrelated to most physician verbal communication behaviors[41]. Our observation that physician positive affect was related to trust among black patients even after adjustment for prior discrimination is consistent with prior work that suggests that blacks are particularly sensitive to non-verbal cues and may use them in making judgments about the quality of interpersonal treatment[42]. Moreover, social psychology studies suggest that implicit racial bias among physicians and stereotype threat among minority patients may be underlying factors. These may lead to poor communication behaviors, reinforcing physicians' racial stereotypes and patients' negative expectations, thus leading to impaired patient-physician relationships[42,43].

This analysis has several limitations. First, the cross-sectional nature makes it impossible to establish a causal relationship between physician communication behaviors and trust. It is possible that prior interactions with the physician or experiences in the health system in general influenced the patient's report of trust. Alternately, physicians may display more positive communication behaviors in the presence of higher trust. Second, knowledge of the study's objectives may have biased physician performance; however, we adjusted for physician intervention assignment and previous work suggests audiotaping has little systematic effects on communication[44,45]. Third, our ability to detect small associations between certain communication behaviors and patient trust was limited by the small sample,

which was underpowered to examine variations in this secondary analysis, particularly in race- and concordance-stratified analyses. Fourth, unmeasured variables, such as the length of the relationship between the patient and the physician, may have affected the results. This study did assess how well the physician knew the patient, which was not associated with patient trust. Finally, we did not measure the interactive nature or the responsiveness of physicians to patients' specific concerns. More in-depth and nuanced qualitative analyses of the visit-specific context might provide further insights into the relationships between communication behaviors and trust.

A major strength of this study is that it is one of few studies to examine the influence of communication on trust using objective measures of physician behavior and assessments of trust from actual patients. In addition, it is one of few studies to examine whether this relationship is modified by the race of the patient or race-concordance in the relationship.

In conclusion, physicians' positive emotional tone is associated with higher trust, particularly in the visits of African-American primary care patients. Because affective behaviors have also been shown to differ by patient race and race-concordance with physicians, communication skills training programs targeting emotion-handling and rapport-building behaviors are promising strategies to reduce disparities in healthcare and to enhance trust among ethnic minority patients[46–48]. These findings have several implications for medical education, future research and clinical practice. Medical training institutions should focus on identifying effective ways of teaching and reinforcing these skills among all physicians, particularly those who care for patients from vulnerable populations. Directions for future research include improving measurement of patient-centered communication and testing the effect of training programs on patient outcomes in diverse populations. Finally, medical practices' efforts to increase their organizational focus on patient-centeredness, for example, by measuring patient experiences and linking performance within this dimension of quality to reimbursement or other incentives, may improve patient trust and patient-physician relationships.

## References

1. National Health Disparities Report, 2008. Rockville, MD: Agency for Healthcare Research and Quality, US Department of Health and Human Services; 2009.

2. Smedley, BD.; Stith, AY.; Nelson, AR. Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care. Washington, DC: National Academy Press; 2002.

3. Boulware LE, Cooper LA, Ratner LE, LaVeist TA, Powe NR. Race and trust in the health care system. Public Health Rep. Jul-Aug;2003 118(4):358–365. [PubMed: 12815085]

4. Doescher MP, Saver BG, Franks P, Fiscella K. Racial and ethnic disparities in perceptions of physician style and trust. Arch Fam Med. Nov-Dec;2000 9(10):1156–1163. [PubMed: 11115223]

5. Safran DG, Taira DA, Rogers WH, Kosinski M, Ware JE, Tarlov AR. Linking primary care performance to outcomes of care. J Fam Pract. Sep; 1998 47(3):213–220. [PubMed: 9752374]

6. Kao AC, Green DC, Davis NA, Koplan JP, Cleary PD. Patients' trust in their physicians: effects of choice, continuity, and payment method. J Gen Intern Med. Oct; 1998 13(10):681–686. [PubMed: 9798815]

7. Thom DH, Kravitz RL, Bell RA, Krupat E, Azari R. Patient trust in the physician: relationship to patient requests. Fam Pract. Oct; 2002 19(5):476–483. [PubMed: 12356698]

8. Griffin SJ, Kinmonth AL, Veltman MW, Gillard S, Grant J, Stewart M. Effect on health-related outcomes of interventions to alter the interaction between patients and practitioners: a systematic review of trials. Ann Fam Med. Nov-Dec;2004 2(6):595–608. [PubMed: 15576546]

9. Stewart M, Brown JB, Boon H, Galajda J, Meredith L, Sangster M. Evidence on patient-doctor communication. Cancer Prev Control. Feb; 1999 3(1):25–30. [PubMed: 10474749]

10. Zolnierek KB, Dimatteo MR. Physician communication and patient adherence to treatment: a meta-analysis. Med Care. Aug; 2009 47(8):826–834. [PubMed: 19584762]

11. Kaplan SH, Greenfield S, Ware JE Jr. Assessing the effects of physician-patient interactions on the outcomes of chronic disease. Med Care. Mar; 1989 27(3 Suppl):S110–127. [PubMed: 2646486]

12. Beach MC, Saha S, Korthuis PT, et al. Patient-provider communication differs for black compared to white HIV-infected patients. AIDS Behav. May; 2011 15(4):805–811. [PubMed: 20066486]

13. Beach MC, Saha S, Korthuis PT, et al. Differences in patient-provider communication for Hispanic compared to non-Hispanic white patients in HIV care. J Gen Intern Med. Jul; 2010 25(7):682–687. [PubMed: 20238204]

14. Johnson RL, Roter D, Powe NR, Cooper LA. Patient race/ethnicity and quality of patient-physician communication during medical visits. Am J Public Health. Dec; 2004 94(12):2084–2090. [PubMed: 15569958]

15. Cene CW, Roter D, Carson KA, Miller ER 3rd, Cooper LA. The effect of patient race and blood pressure control on patient-physician communication. J Gen Intern Med. Sep; 2009 24(9):1057–1064. [PubMed: 19575270]

16. Ghods BK, Roter DL, Ford DE, Larson S, Arbelaez JJ, Cooper LA. Patient-physician communication in the primary care visits of African Americans and whites with depression. J Gen Intern Med. May; 2008 23(5):600–606. [PubMed: 18264834]

17. Cooper-Patrick L, Gallo JJ, Gonzales JJ, et al. Race, gender, and partnership in the patient-physician relationship. JAMA. Aug 11; 1999 282(6):583–589. [PubMed: 10450723]

18. Balkrishnan R, Dugan E, Camacho FT, Hall MA. Trust and satisfaction with physicians, insurers, and the medical profession. Med Care. Sep; 2003 41(9):1058–1064. [PubMed: 12972845]

19. Cooper LA, Roter DL, Johnson RL, Ford DE, Steinwachs DM, Powe NR. Patient-centered communication, ratings of care, and concordance of patient and physician race. Annals of internal medicine. Dec 2; 2003 139(11):907–915. [PubMed: 14644893]

20. Thom DH. Physician behaviors that predict patient trust. J Fam Pract. Apr; 2001 50(4):323–328. [PubMed: 11300984]

21. Haywood C Jr, Lanzkron S, Ratanawongsa N, et al. The association of provider communication with trust among adults with sickle cell disease. J Gen Intern Med. Jun; 2010 25(6):543–548. [PubMed: 20195785]

22. Fiscella K, Meldrum S, Franks P, et al. Patient trust: is it related to patient-centered behavior of primary care physicians? Med Care. Nov; 2004 42(11):1049–1055. [PubMed: 15586831]

23. Gordon HS, Street RL Jr, Sharf BF, Kelly PA, Souchek J. Racial differences in trust and lung cancer patients' perceptions of physician communication. J Clin Oncol. Feb 20; 2006 24(6):904–909. [PubMed: 16484700]

24. Rawaf MM, Kressin NR. Exploring racial and sociodemographic trends in physician behavior, physician trust and their association with blood pressure control. J Natl Med Assoc. Nov; 2007 99(11):1248–1254. [PubMed: 18020100]

25. Cooper LA, Roter DL, Bone LR, et al. A randomized controlled trial of interventions to enhance patient-physician partnership, patient adherence and high blood pressure control among ethnic minorities and poor persons: study protocol NCT00123045. Implement Sci. 2009; 4:7. [PubMed: 19228414]

26. Cooper LA, Roter DL, Carson KA, et al. A Randomized Trial to Improve Patient-Centered Care and Hypertension Control in Underserved Primary Care Patients. J Gen Intern Med. 2011; 26:1297–1304. [PubMed: 21732195]

27. Roter D, Larson S. The Roter interaction analysis system (RIAS): utility and flexibility for analysis of medical interactions. Patient Educ Couns. Apr; 2002 46(4):243–251. [PubMed: 11932123]

28. Roter DL, Stewart M, Putnam SM, Lipkin M Jr, Stiles W, Inui TS. Communication patterns of primary care physicians. JAMA. Jan 22–29; 1997 277(4):350–356. [PubMed: 9002500]

29. Price EG, Windish DM, Magaziner J, Cooper LA. Assessing validity of standardized patient ratings of medical students' communication behavior using the Roter interaction analysis system. Patient Educ Couns. Jan; 2008 70(1):3–9. [PubMed: 18037602]

30. Paasche-Orlow M, Roter D. The communication patterns of internal medicine and family practice physicians. J Am Board Fam Pract. Nov-Dec;2003 16(6):485–493. [PubMed: 14963075]

31. Roter DL, Hall JA. How physician gender shapes the communication and evaluation of medical care. Mayo Clin Proc. Jul; 2001 76(7):673–676. [PubMed: 11444398]

32. 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. Mar; 1996 34(3):220–233. [PubMed: 8628042]

33. Thom DH, Ribisl KM, Stewart AL, Luke DA. Further validation and reliability testing of the Trust in Physician Scale. The Stanford Trust Study Physicians. Med Care. May; 1999 37(5):510–517. [PubMed: 10335753]

34. Armstrong K, Ravenell KL, McMurphy S, Putt M. Racial/ethnic differences in physician distrust in the United States. Am J Public Health. Jul; 2007 97(7):1283–1289. [PubMed: 17538069]

35. Durant RW, McClure LA, Halanych JH, et al. Trust in physicians and blood pressure control in blacks and whites being treated for hypertension in the REGARDS study. Ethn Dis. Summer;2010 20(3):282–289. [PubMed: 20828103]

36. Safran DG, Kosinski M, Tarlov AR, et al. The Primary Care Assessment Survey: tests of data quality and measurement performance. Med Care. May; 1998 36(5):728–739. [PubMed: 9596063]

37. Cruz M, Roter D, Cruz RF, et al. Psychiatrist Verbal and Nonverbal Partnership Building Communication Behaviors in Medication Management Appointments- Do they improve Appointment Adherence?. 2012 Manuscript under Review.

38. Williams DR, Neighbors HW, Jackson JS. Racial/ethnic discrimination and health: findings from community studies. Am J Public Health. Feb; 2003 93(2):200–208. [PubMed: 12554570]

39. Williams DR, Mohammed SA. Discrimination and racial disparities in health: evidence and needed research. J Behav Med. Feb; 2009 32(1):20–47. [PubMed: 19030981]

40. Adegbembo AO, Tomar SL, Logan HL. Perception of racism explains the difference between Blacks' and Whites' level of healthcare trust. Ethn Dis. Autumn;2006 16(4):792–798. [PubMed: 17061729]

41. Hausmann LR, Hannon MJ, Kresevic DM, Hanusa BH, Kwoh CK, Ibrahim SA. Impact of perceived discrimination in healthcare on patient-provider communication. Med Care. Jul; 2011 49(7):626–633. [PubMed: 21478769]

42. Cooper LA, Roter DL, Carson KA, et al. The Associations of Clinicians' Implicit Attitudes About Race With Medical Visit Communication and Patient Ratings of Interpersonal Care. Am J Public Health. 2012; 102:979–987. [PubMed: 22420787]

43. Burgess DJ, Warren J, Phelan S, Dovidio J, van Ryn M. Stereotype threat and health disparities: what medical educators and future physicians need to know. J Gen Intern Med. May; 2010 25( Suppl 2):S169–177. [PubMed: 20352514]

44. Pringle M, Stewart-Evans C. Does awareness of being video recorded affect doctors' consultation behaviour? Br J Gen Pract. Nov; 1990 40(340):455–458. [PubMed: 2271278]

45. Redman S, Dickinson JA, Cockburn J, Hennrikus D. The assessment of reactivity in direct observation studies of doctor-patient interactions. Psychol Health. 1989; 3(1):17–28.

46. Blatt B, LeLacheur SF, Galinsky AD, Simmens SJ, Greenberg L. Does perspective-taking increase patient satisfaction in medical encounters? Acad Med. Sep; 2010 85(9):1445–1452. [PubMed: 20736672]

47. Burgess D, van Ryn M, Dovidio J, Saha S. Reducing racial bias among health care providers: lessons from social-cognitive psychology. J Gen Intern Med. Jun; 2007 22(6):882–887. [PubMed: 17503111]

48. Krasner MS, Epstein RM, Beckman H, et al. Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. JAMA. Sep 23; 2009 302(12):1284–1293. [PubMed: 19773563]

**Table 1**

Demographic and Visit Characteristics of Sample for All Patients and Stratified by Patient Race

| | All (N=227) | Black (N=138) | White (N=89) | p |
|---|---|---|---|---|
| Patient Characteristics | | | | |
| Age (years) | 61.8 ± 12.1 | 60.3±12.4 | 64.0 ± 11.6 | 0.03 |
| Male | 78 (34.4) | 45 (32.6) | 33 (37.1) | 0.49 |
| High School Graduate | 157 (69.2) | 89 (64.5) | 68 (76.4) | 0.06 |
| General Health | | | | 0.79 |
|   Very Good/Excellent | 42 (18.5) | 24 (17.4) | 18 (20.2) | |
|   Good | 85 (37.4) | 51 (37.0) | 34 (38.2) | |
|   Fair/Poor | 100 (44.1) | 63 (45.7) | 37 (41.6) | |
| Previously Experienced | 75 (33.0) | 52 (37.7) | 23 (25.8) | 0.06 |
| Discrimination Controlled Blood Pressure (JNC 7)[*] | 112 (49.3) | 58 (42.0) | 54 (60.7) | 0.01 |
| Characteristics of Physician seen at Visit | | | | |
| Male | 105 (46.3) | 61 (44.2) | 44 (49.4) | 0.44 |
| Race/Ethnicity | | | | 0.002 |
|   White | 113 (49.8) | 57 (41.3) | 56 (62.9) | |
|   Black | 56 (24.7) | 45 (32.6) | 11 (12.4) | |
|   Hispanic | 4 (1.7) | 2 (1.4) | 2 (2.3) | |
|   Asian | 54 (23.8) | 34 (24.6) | 20 (22.5) | |
| Race Concordance | | | | <0.001 |
|   Concordant | 101 (44.2) | 45 (32.6) | 56 (62.9) | |
|   Discordant | 126 (55.8) | 93 (67.4) | 33 (37.1) | |
| Specialty | | | | <0.001 |
|   Internal Medicine | 206 (90.8) | 117 (84.8) | 89 (100.0) | |
|   Family/General Practitioner | 21 (9.3) | 21 (15.2) | 0 (0.0) | |
| Intervention Assignments | | | | 0.88 |
|   MD Intensive/Patient Intensive | 67 (29.5) | 42 (30.4) | 25 (28.1) | |
|   MD Intensive/Patient Minimal | 66 (29.1) | 38 (27.5) | 28 (31.5) | |
|   MD Minimal/ Patient Intensive | 45 (19.8) | 29 (21.0) | 16 (18.0) | |
|   MD Minimal/Patient Minimal | 49 (21.6) | 29 (21.0) | 20 (22.5) | |

Continuous data are mean ± standard deviation (SD). Categorical data are n (%).

[*] Two black patients were missing blood pressure data at baseline.

**Table 2**

Patient Trust and Communication Measures for all Patient Visits and Stratified by Patient Race

| | All Visits (N=227) | Black Patients (N=138) | White Patients (N=89) | p |
|---|---|---|---|---|
| High Trust in Physician | 152 (67.0) | 85 (61.6) | 67 (75.3) | 0.03 |
| Physician Informational Behaviors | | | | |
| Biomedical | 102.5 ± 57.6 | 99.6 ± 61.2 | 107.0 ± 51.7 | 0.35 |
| Psychosocial | 24.5 ± 24.2 | 24.9 ± 25.9 | 23.9 ± 21.3 | 0.75 |
| Physician Affective Behaviors | | | | |
| Rapport Building | 42.0 ± 25.3 | 37.8 ± 20.2 | 48.5± 30.7 | 0.004 |
| Partnership Building | 24.8 ± 15.5 | 23.4 ± 14.8 | 26.8 ± 16.5 | 0.11 |
| Positive Physician Affect | 20.8 ± 2.3 | 20.9 ± 2.1 | 20.8 ± 2.5 | 0.94 |
| Communication Process | | | | |
| Visit Length (minutes) | 14.8 (8.9) | 13.4 (8.7) | 16.8 (10.2) | <0.001 |
| Speech Speed | 24.2 (7.42) | 25.0 (7.3) | 22.8 (7.3) | 0.03 |
| Verbal Dominance | 1.22 (0.64) | 1.30 (0.69) | 1.07 (0.45) | <0.001 |
| Patient Centeredness | 0.54 (0.37) | 0.50 (0.37) | 0.59 (0.34) | 0.19 |

Data are mean ± SD for informational and affective behaviors; median (interquartile range: IQR) for process variables and n(%) for trust

**Table 3**

Adjusted Association of each Physician Communication Behavior with Patient Trust

| Communication Measure | Overall | | Black Patients | | White Patients | |
|---|---|---|---|---|---|---|
| | Odds Ratio | 95% CI | Odds Ratio | 95% CI | Odds Ratio | 95% CI |
| Physician Informational Behaviors | | | | | | |
| Biomedical | 1.003 | (0.997, 1.010) | 1.003 | (0.996, 1.010) | 1.008 | (0.995, 1.022) |
| Psychosocial | 1.010 | (0.996, 1.024) | 1.012 | (0.995, 1.029) | 1.010 | (0.980, 1.040) |
| Physician Affective Behaviors | | | | | | |
| Rapport Building | 1.008 | (0.993, 1.024) | 1.021 | (0.999, 1.045) | 0.999 | (0.979, 1.020) |
| Partnership Building | 1.001 | (0.980, 1.022) | 1.003 | (0.976, 1.031) | 1.003 | (0.970, 1.038) |
| Positive Physician Affect * | **1.262** | **(1.079, 1.476)** | **1.352** | **(1.093, 1.673)** | 1.149 | (0.880, 1.499) |
| Communication Process | | | | | | |
| Visit Length (minutes) † | 1.033 | (0.988, 1.080) | 1.021 | (0.967, 1.078) | 1.079 | (0.988, 1.178) |
| Speech Speed‡ | 0.991 | (0.944, 1.041) | 1.005 | (0.947, 1.066) | 0.985 | (0.909, 1.067) |
| Verbal Dominance# | 1.164 | (0.686, 1.974) | 1.177 | (0.639, 2.166) | 1.211 | (0.303, 4.835) |
| Patient Centeredness | 1.517 | (0.581, 3.960) | 1.757 | (0.552, 5.595) | 1.025 | (0.163, 6.425) |

Results are the odds ratio for high trust associated with a 1 unit increase in the communication measure from general estimating equations regression analysis, controlling for nesting within physician.

Models were adjusted for patient race; age; perceived racial discrimination in health care system; general health; physician race concordance; and patient and physician intervention group.

*
Also adjusted for physician gender.

†
Also adjusted for patient blood pressure control.

‡
Also adjusted for patient education.

#
Also adjusted for patient gender.