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Patient-Physician Social Concordance, Medical Visit Communication and Patients' Perceptions of Health Care Quality

Rachel L. Johnson Thornton, MD, PhD,

Johns Hopkins School of Medicine, Division of General Pediatrics and Adolescent Medicine, 200 N. Wolfe Street, 2nd floor, Baltimore, MD 21287

Neil R. Powe, MD, MPH, MBA,

University of California San Francisco, San Francisco General Hospital

Debra Roter, DrPH, and

Johns Hopkins Bloomberg School of Public Health, Department of Health, Behavior, and Society and Johns Hopkins School of Medicine, Division of General Internal Medicine

Lisa A. Cooper, MD, MPH

Johns Hopkins School of Medicine, Division of General Internal Medicine & Johns Hopkins Bloomberg School of Public Health, Departments of Epidemiology, Health Policy & Management, & Health, Behavior, and Society

Abstract

Social characteristics (e.g. race, gender, age, education) are associated with health care disparities. We introduce *social concordance*, a composite measure of shared social characteristics between patients and physicians.

Objective—To determine whether *social concordance* predicts differences in medical visit communication and patients' perceptions of care.

Methods—Regression analyses were used to determine the association of patient-provider *social concordance* with medical visit communication and patients' perceptions of care using data from two observational studies involving 64 primary care physicians and 489 of their patients from the Baltimore, MD/Washington, DC/Northern Virginia area.

Results—Lower patient-physician *social concordance* was associated with less positive patient perceptions of care and lower positive patient affect. Patient-physician dyads with low vs. high *social concordance* reported lower ratings of global satisfaction with office visits (OR=0.64 vs. OR=1.37, p=0.036) and were less likely to recommend their physician to a friend (OR=0.61 vs. OR=1.37, p=0.035). A graded-response was observed for social concordance with patient positive affect and patient perceptions of care.

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Corresponding Author: Rachel L. Johnson Thornton, MD, PhD, Assistant Professor of Pediatrics, Johns Hopkins School of Medicine, Division of General Pediatrics and Adolescent Medicine, Rubenstein Child Health Building, 2nd floor, 200 N. Wolfe St., room 2075, Baltimore, MD 21287, 410-614-2908 (Tel) / 410-502-5440 (Fax) / rjohns21@jhmi.edu.

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Conclusion—Patient-physician concordance across multiple social characteristics may have cumulative effects on patient-physician communication and perceptions of care.

Practice Implications—Research should move beyond one-dimensional measures of patient-physician concordance to understand how multiple social characteristics influence health care quality.

Keywords

patient-provider communication; health care disparities; patient-provider concordance

1. Introduction

The notion that disparities in health and health care may result from a combination of relational factors within the patient-physician relationship and contextual and structural factors that result in status differentials for social groups within society based on race, gender, age, or other shared social or cultural characteristics is gaining support(1;2). Patient social characteristics such as race, gender, age, and education are associated with disparities in health care (3); are linked to treatment adherence (4), decision-making (5), and satisfaction (6–10); and are also associated with health outcomes(11–13). Research suggests physicians also bring expectations, biases, and values to medical visits (14;15). And, physicians' own social characteristics influence the way they are perceived by patients (16–20).

Studies have found that physicians are more likely to view African-American patients as noncompliant or less intelligent than whites (14), and health care providers have more positive appraisals of patients who are better educated and employed (21). Our previous work demonstrated differences in the content and tone of medical visit communication for African-American versus white patients such that physicians are more verbally dominant with African Americans and have a less positive tone than with whites (22). Differences in patient-provider communication are also associated with patients' social class (23) and gender (24), and with physician gender (25). Older patients also tend to have an expectation that the patient-physician relationship should be more dominated by physician expertise than do younger patients, which also has implications for medical visit communication (26).

Concordance is defined as the degree of patient and physician similarity or agreement across a given dimension. Sharing specific social characteristics (e.g. gender, race, socioeconomic status, education), expectations, beliefs, and perceptions impact health care quality (7–10;20;23;27;27;28;28–41). Current literature on patient-physician concordance studies most often involves analyses that examine one shared characteristic in isolation from others. Therefore, the need to understand the cumulative impact of patient-physician concordance on communication and healthcare quality persists. We establish a framework for a multidimensional measure of shared social characteristics, called *social concordance*.

Social concordance (SC) is related to the concepts of homophily and interpersonal perceptions(42;43), but it is a distinct construct. While homophily focuses on the probability of contact between people increasing with increasing similarity, *SC* is an evaluation of similarity with respect to social identity characteristics (e.g. race, gender, education, age) of participants in a specific interaction and does not evaluate the extent to which their social networks differ. While the concept of *interpersonal perceptions* applies directly to participants in a given interaction, it focuses on the extent to which participants (e.g. doctors and patients) share similar perceptions and values (43). That values and perceptions among members of the same social groups often correspond more closely than among members of different social groups is not insignificant (42), yet it does represent an important distinction

between *SC* and *interpersonal perceptions*. We define *SC* in relation to *status homophily* because it is based on similarities with respect to status related identity characteristics (e.g. race, gender, age, education) versus an explicit set of shared values or beliefs (42;43). Our conceptualization of *social concordance* includes dimensions that are clearly visible (i.e. gender, ethnicity and age) and less immediately obvious identity characteristic (i.e. education). All of these relate to social status within interactions, which is what unifies them. As such, *SC* does not explicitly capture shared values, beliefs, or perceptions.

This study aims to determine whether *SC* is associated with differences in the quality of medical visit communication and patients' perceptions of care. We hypothesized that lower patient-physician *SC* is associated with lower quality medical visit communication and less positive patient perceptions of care.

2. Methods

2.1 Study Design and Population

We used data from two brief cohort studies conducted from July 1998–June 1999 and January–November 2002. The details of data collection are summarized elsewhere (22;32). The protocols were reviewed and approved by the Johns Hopkins Medical Institutions Institutional Review Board and informed consent was obtained from all participants. Physicians were recruited from group practices and federally qualified health centers in the Baltimore/Washington, D.C./northern Virginia area. Both studies targeted practices with a high percentage of African-American physicians and patients.

Patients were eligible to participate if they were: 1) 18 years of age or older and 2) seeing their physician on the recruitment days. Only African-American and white patients were recruited for the 1998 study. Patients of all racial/ethnic backgrounds were eligible to participate in the 2002 study. Patients who appeared too acutely ill or cognitively impaired to complete study questionnaires and participate in the interview were not approached. Attempts were made to recruit patients who had previously seen the physician, but there was no pre-established length of relationship required for participation.

2.2 Data Collection

Informed consent was obtained from all participants. They were told the goal of the study was to learn about how doctors and patients communicate. Patients completed a 5-minute survey that included questions regarding their health status and social characteristics. Research assistants set up a tape recorder in the physician's office, started the recording, and left the room. Physicians and patients were instructed that they could turn off the tape recorder or pause the recording at any time. Physicians also completed a background questionnaire and a post-visit questionnaire. The background questionnaire provided information about their social characteristics and medical credentials (e.g. time since completing training, exposure to communication skills training). The post-visit questionnaire asked physicians how well the physician felt he/she knew the patient seen during the preceding visit.

Audio taped medical visits were coded with the Roter Interaction Analysis System (RIAS), which provides a framework for understanding the dynamics of patient-physician communication medical visits and has well-established reliability and predictive validity (44;45). The RIAS captures four functions medical visits: data gathering, patient education and counseling, responding to patient emotions, and partnership building (44). Coders are asked to rate the global affect of the patient and the physician across several dimensions on a scale of 1–6 (1=low/none, 6=high). The two highly experienced coders (both white women) were unaware of study hypotheses. Overall reliability for RIAS coding of patient and

physician talk were similar for the 1998 and 2002 studies (0.79–0.86 and 0.88–0.90 respectively)(22;32).

2.3 Measures

The independent variable in this study is *social concordance (SC)*. *SC* is an additive composite score accounting for the degree of patient-physician concordance across four social characteristics: race, gender, age, and education. Study participants self-identified as: 1) white (not of Latino origin), 2) Black (not of Latino origin), 3) Hispanic or Latino, 4) Asian or Pacific Islander, and 5) American Indian or Alaskan Native. Physicians were also given the option to write-in their race in an “other” category. Patients (n=9) who identified as members of more than one racial/ethnic group or who identified their race as other than white or African-American (n=9) were excluded from analyses. Patient-physician dyads who reported membership in the same racial group were categorized as *race concordant*. Dyads were *gender concordant* when the patient and physician self-reported the same gender.

Patients in both cohorts and physicians in the 2002 cohort were asked their date-of-birth. Their age at the time of the medical visit was calculated using their reported birth date and the date of the audio taped medical visit. Age of physicians in the 1998 cohort was estimated since birthdates were not available. We used the mean age upon completing training from the 2002 cohort as the estimated age upon completing training for all physicians in the 1998–1999 cohort. Estimated physician age was equal to the estimated mean age upon completing training plus the subsequent number of years to the time of the study visit. The actual or estimated age of physicians was subtracted from the age of the patient at the time of the visit to obtain an absolute age difference (years) for each dyad. Dyads were categorized as *age concordant* when patient and physician ages were within 5 years of one another.

Each patient reported the total number of years of education he/she had completed on the background questionnaire. Patients who had completed 4 years or more of college were coded as having completed at least 4 years of post-high school education. Based on this coding system, all physicians would also have been coded as having completed at least 4 years of post-high school education. Any patient who reported completing at least 4 years of college was considered to be *educationally concordant* with his/her physician.

SC is a composite that attributes equal weight to all four social characteristics described above. For example, a race concordant, gender discordant, age discordant and educationally concordant dyad would receive the same overall score as a race discordant, gender concordant, age concordant, and educationally discordant dyad (*SC score* = 2). This approach generated *SC scores* ranging from 0 to 4. Because there were a small number (n=16) of completely concordant dyads, for analytic purposes, we collapsed the scale into three ordinal categories: *high* (reference group, *score* of 3 or more), *medium* (*score* =2), and *low* (*score* of 1 or less) *SC*.

Patient-physician communication and patients' perceptions of care are the main outcomes. Patient-physician communication was assessed using measures derived from coding of audiotaped medical visit using the RIAS. *Medical visit duration* was based on the amount of time (in minutes) that transpired from the start of the medical visit until its conclusion. *Physician verbal dominance* and *Physician patient-centeredness scores* have been used in other manuscripts and are intended to reflect the overall patient-centered orientation of the visit (22;26;32;45;46). *Positive affect scale* scores were calculated separately for physicians and patients by summing coders' global ratings for each across several affective dimensions. Inter-item reliability (Cronbach's α) for both scales was high (patient positive affect $\alpha=0.83$;

physician positive affect $\alpha=0.91$) (22). A detailed description of the methods used to create these scores is described in an earlier publication (32).

Participatory Decision-Making (PDM Score)—Three items were used to evaluate patients’ perceptions of their physicians’ participatory decision-making style, each of which is rated on a five-point scale (from 0 to 4) and has been described in other publications by these authors (31;32). A higher PDM score means the visit was more participatory (31;47;48). *Global Satisfaction* – Patients were asked to report the degree to which they agreed (1=strongly disagree, to 5=strongly agree) with the statement: “Overall, I was satisfied with the visit”. Based on the distribution of responses, the global satisfaction score was dichotomized. Those patients reporting strong agreement were compared to all others. *Recommendation of Physician to a Friend* – Patients were asked whether they would recommend their physician to a friend or not. Responses were dichotomized such that patients reporting strong agreement that they would recommend their physician to a friend were compared to all others.

2.4 Statistical Analysis

Univariate linear regression analyses were performed relating all social characteristics and all concordance measures used to create the *SC* score with the outcomes of interest. Because age, race, gender, and education of both patients and physicians are used to calculate the *SC* score, we did not include these characteristics as individual-level covariates in our models. In all cases, inclusion of the individual-level covariates in addition to the composite *SC* score (i.e. including patient race, gender, age, or education and/or the physician equivalents) would be over-controlling the model and essentially controlling for these characteristics more than once, which would likely increase our likelihood of type 2 error and result in accepting the null hypothesis when it is actually false. We included only three covariates that we decided a priori may be important for patient-physician communication and patients’ ratings of care: 1) patient’s self-rated health status, 2) physician’s appraisals of how well they know a given patient, and 3) whether the dyad was from the 1998–1999 or the 2002 study sample.

We used the generalized estimating equation (GEE) method for correlated data (49) in all regression analyses in order to account for the inclusion of multiple patient visits with the same physician, which resulted in non-independence of physicians across multiple patient observations. An exchangeable correlation structure was assumed using robust estimation, which is likely to yield more accurate or valid coefficient estimates, even if the correlation structure is mis-specified (50). Because some physicians practiced at more than one site, analyses were not designed to account for intra-class correlation within sites.

3. Results

Data was collected for a total of 548 patients. All patients who did not report their race/ethnicity were excluded from analyses (n=9). Of the 539 patients who reported their race/ethnicity, those who reported membership in more than one racial/ethnic group (n=9) or who did not identify as either African American/black or white (n=9) were excluded from analyses in order to maximize the construct validity of the *SC* score. The final sample included 489 patients (255 African Americans and 234 whites) who saw one of 64 study physicians (35 whites, 19 African Americans, and 10 Asians). Sample characteristics are summarized in Tables 1–2.

The mean age of patients overall was 49.8 years. Patients in mostly concordant dyads (*high SC*) were younger than those in somewhat concordant dyads (*medium SC*), who were younger than those in mostly discordant dyads (*low SC*). White patients were statistically

significantly more likely ($p < 0.001$) to be in *high SC* dyads (74.3% white v. 25.7% African American) versus *medium* (46% white v. 54% African American) or *low SC* dyads (41.3% white v. 58.7% African American).

The overall mean education level for patients was 12.6 years. Patients' educational level decreases with decreasing *SC* such that patients in *high SC* dyads have the highest mean education level (15.7 years) and patients in *medium* and *low SC* dyads have statistically significantly lower ($p < 0.001$) mean education levels (12.5 years and 11.8 years respectively). While only one third of patients in the sample reported their health as very good or excellent, statistically significantly ($p < 0.001$) more patients in *high SC* dyads reported very good to excellent health (63.5%) versus *medium* (35%) or *low* (22.8%) *SC* dyads.

Table 2 summarizes the characteristics of physicians in *high*, *medium*, and *low SC* dyads. All Asian physicians were from the 2002 study and were part of *medium* or *low SC* dyads ($n=15$ and $n=61$, respectively). Statistically significantly ($p < 0.001$) more *high SC* dyads (76%) involved white physicians versus *medium* and *low SC* (47.9% and 55.6% respectively). Figure 1 summarizes the proportion of concordant versus discordant dyads for each of the 4 social characteristics included in the *SC* score. Table 3 examines the patterns of concordance across *high*, *medium*, and *low SC* dyads. Of interest, nearly 99% of the dyads with *high SC* were race concordant whereas only 55% of *high SC* dyads were age concordant.

Decreasing patient-physician *SC* was statistically significantly associated with decreasing patient positive affect for both *medium* and *low SC* dyads as compared to *high SC* dyads in multivariate analyses (Table 4). Furthermore, there appeared to be a graded-response relation between social concordance and positive affect (p for trend=0.017).

As displayed in Table 5, social concordance was associated with several measures of patient perception of care. The odds of patients strongly agreeing that they were completely satisfied with their care was statistically significantly lower for patients in *low* versus *high SC* dyads in univariate and multivariate analyses (OR=0.64 95% CI 0.39–0.89, $p=0.036$ for multivariate analysis). In addition, there appeared to be a graded-response relation between *SC* and odds of satisfaction with care (p for trend= 0.011 and 0.016 for univariate and multivariate models respectively). Patients in *low* versus *high SC* dyads were less likely to strongly agree that they would recommend their physician to a friend (OR=0.55, 95% CI 0.26–0.84 in unadjusted analyses $p=0.051$). This relationship was statistically significant in the adjusted model (OR=0.61, 95% CI 0.26–0.95, $p=0.035$). As with global satisfaction, there were no statistically significant differences in the odds of recommending one's physician to a friend among patients in *medium* versus *high SC* dyads, but as above, there was a statistically significant trend indicating the presence of a likely graded-response relation between *SC* and odds of recommending one's physician to a friend (p for trend=0.035 and 0.027 univariate and multivariate models respectively).

4. Discussion and Conclusion

Social identity often evokes images of status, power and privilege. In this regard, lower levels of social concordance in the doctor and patient relationship almost always reflects higher levels of patient vulnerability. But the construct of social concordance also embodies areas of commonality, and in this regard it provides a wider window into the nature of social relationships that develop between doctors and patients during medical visits. In fact, to the extent that shared social characteristics between patients and doctors create a space for common understanding or shared context that serves as the backdrop for improving communication, our exploration of social concordance is a way of understanding the

complex web of social characteristics that influence medical visit communication and patients' perceptions of care.

4.1 Discussion

The results of this study suggest that *SC* is positively associated with patient satisfaction with care and may affect the communication and affective tone of medical visits. While one could view such research as supporting matching patients with providers who share particular social characteristics, we argue that this is not the principal implication of our findings. Rather, when taking into account the differences that exist in the demographic composition of the physician workforce and the U.S. population, it is clear that understanding the potential *cumulative* effects of social status differences in patient-physician dyads is critical to improving the quality of care for patients who are less likely to share social characteristics with their physicians. This could be accomplished through many mechanisms but will likely require concerted efforts on the part of physicians to bridge the divide with patients whose social status differs significantly on multiple dimensions from their physicians. Furthermore, we think it important to emphasize that while *SC* is associated with patient positive affect and patient perceptions of care (global satisfaction and recommendation of physician to a friend), it is worth noting that explicit communication elements of the medical dialogue do not seem to vary with *SC*. We think it is reasonable to suggest that the primary response to social concordance is in the affective and non-verbal realm, rather than the more cognitive and verbally explicit domains of communication (51).

Many outcomes associated with *SC* were also associated with race concordance (32). Given the high correspondence between *SC* and race concordance, our result might not be unexpected. However, in light of the statistically significant graded-response trends observed, it would be inappropriate to wholly attribute our findings to race concordance alone. The nature of social relationships that develop between patients and their doctors is more complex and rich than is represented by a single marker, even one as culturally meaningful for American society as race and ethnicity. In exploratory analyses (data not presented), we found that each concordance measure was independently associated with several outcomes, however, the pattern of relationships observed for the 4-measure social concordance composite is unique and is not entirely duplicated by race, gender, education or age concordance as an independent covariate. That being said, it is possible that there is a threshold at which concordance with respect to social characteristics can be most strongly associated with medical visit communication. Because the *SC* scale we employed in this analysis does not differentially weight one social characteristic versus another, it is possible that the specific influence or dominance of a social characteristic such as race is underappreciated. In fact, identifying the threshold at which concordance on one versus another social characteristic matters more would be a logical next step in further characterizing the extent to which shared social characteristics have cumulative versus threshold effects on interpersonal interactions in the patient-provider relationship.

Furthermore, our conceptualization of *SC* is based on only four social identity characteristics. It should be considered a first attempt at characterizing the cumulative shared social identities that affect patient-physician relationships. There may be other markers to consider for instance, when patients do not speak the same primary language as their physician, or when the patient uses another mode of communication such as American Sign Language, or when patients' limited literacy restricts their ability to understand and be understood by their physician (52). In a similar vein, our measure does not account for values, beliefs, and ideologies that may represent additional sources of *SC*; nor does it address perceived similarity. Work by Street et al (41) suggests, however, that perceived similarity is highly correlated with race concordance.

That being said, it is quite possible that other characteristics matter more to some patients than any of the social status characteristics included in the *SC* score. Understanding more about how a wide array of shared characteristics exerts cumulative effects on patient-provider communication is an area ripe for further research. Furthermore, understanding how attitudes and implicit stereotypes affect patient-provider interactions is critical to improving our understanding of the potential mechanisms by which social status characteristics affect patient-provider interactions.

Additional limitations of this study include non-random sampling of physicians and patients, and inclusion of a limited range of racial/ethnic groups. In particular, we were unable to assess within group heterogeneity for any of the ethnic groups included in this study. While this issue is most often raised as a methodological concern for Hispanic and Asian research participants, we recognize that African-Americans represent a broad array of cultural groups as do whites. The precision associated with individual concordance measures may differ across social characteristics and patient and physician self-reports of their own race/ethnicity may not always reflect how they are perceived by one another. We did not collect information on post-college-graduate education for patients, which might have diminished the precision of the educational concordance measure and our narrow criteria (within 5 years) for age concordance may have over-specified perceived age concordance.

While some may argue that attempts should have been made to control for race and gender of dyad participants or conduct stratified analyses to evaluate whether *SC* has the same associations with medical visit communication and patients' perceptions of care across different racial/ethnic groups, we hold that given the limited sample size, controlling for patient race in our multivariate model would have resulted in over-controlling the model. Similarly, our sample size did not provide adequate statistical power to examine how race, age, education, and gender might each act to modify the effect of the other, on outcomes.

4.2 Conclusion

Despite these limitations, we believe that our findings suggest that consideration of simultaneously held multiple identity characteristics can foster a more transparent and nuanced approach to understanding the varied pathways by which therapeutic relationships are shaped and how they contribute to health care quality.

4.3 Practice Implications

This research is a first step in better understanding the implications of cumulative patient-physician social concordance for medical visit communication and patients' perceptions of care. It suggests the need to improve our understanding of how patients and physicians process information about differences and similarities and how this influences the quality of patient-provider interactions. A more complete understanding is required in order to develop interventions aimed at physician training as well as patient education and activation training to improve interpersonal interactions. Additional work in this area will likely elucidate structural interventions, such as enhancing diversity among medical students that may be important to address the extent to which patient-physician *social discordance* systematically affects certain racial/ethnic groups disproportionately.

We suggest that our conceptualization of *SC* might also contribute to the discourse surrounding *cultural health capital* (CHC). As articulated by Shim, CHC is “a repertoire of skills, verbal and nonverbal competencies, and interactional styles that can influence health care interactions” (p.2) (2); we contend that *SC* implicitly recognizes that shared characteristics have the potential to create opportunities for cultural understanding. It also implies that lacking these shared characteristics may have negative health implications that

are inequitably distributed among population certain sub-groups. *social concordance* captures interpersonal and structural aspects of CHC and could be used to operationalize CHC and identify ways to build CHC among subpopulations currently experiencing systematic disadvantage, less positive interpersonal relationships, and disparities in health and health care.

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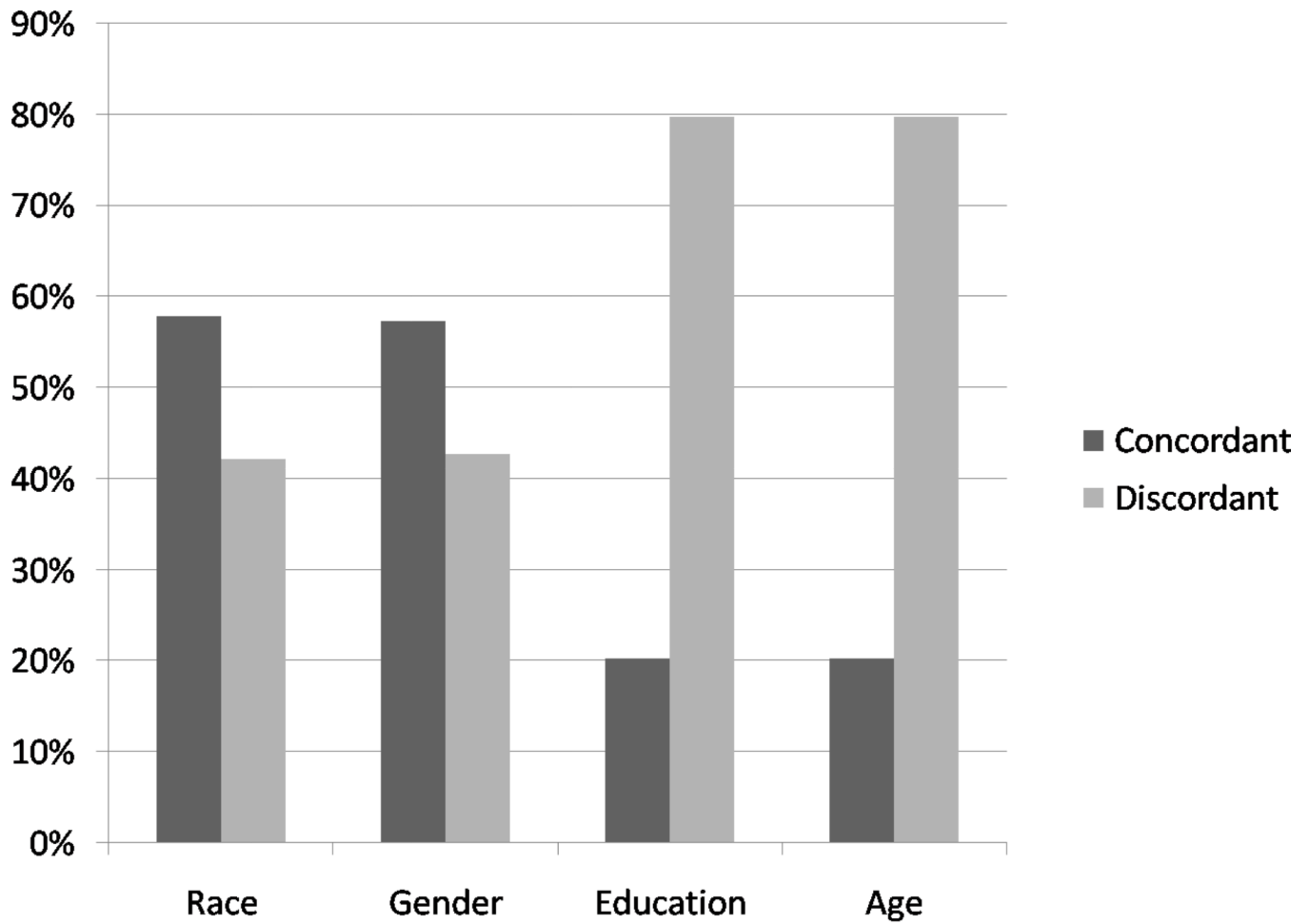


Figure 1.
Proportion of Concordant vs. Discordant Patient-Physician Dyads with Respect to Each Social Characteristic Included in the Social Concordance Score

Table 1
 Characteristics of Patients in Patient-Physician Dyads by *Social Concordance* Score

	Total (N=489) ^a	High Concordance (share 3 or more characteristics) (n=74) ^a	Medium Concordance (share 2 characteristics) (n=163) ^a	Low Concordance (share 1 or fewer characteristic) (n=252) ^a	p-value [*]
Time of Medical Visit and Questionnaire Completion					
Wave 1 (1998)	221 (45.2)	28 (37.8)	101 (62.0)	92 (36.5)	
Wave 2 (2002)	268 (54.8)	46 (62.2)	62 (38.0)	160 (63.5)	<0.001
Patient Demographics					
Mean Age (SD)	49.8 (16.3)	44.0 (13.8)	48.4 (15.1)	52.5 (17.2)	<0.001
Gender (%)					
Male	164 (33.5)	29 (39.2)	57 (35.0)	78 (31.0)	
Female	325 (66.5)	45 (60.8)	106 (65.0)	174 (69.0)	0.374
Race (%)					
White	234 (47.9)	55 (74.3)	75 (46.0)	104 (41.3)	
African American	255 (52.1)	19 (25.7)	88 (54.0)	148 (58.7)	<0.001
Mean (SD) Years of Education	12.6 (2.7)	15.7 (2.0)	12.5 (2.5)	11.8 (2.3)	<0.001
Self-rated health status (%)					
Poor/Fair	140 (28.8)	4 (5.4)	42 (25.8)	94 (37.6)	
Good	186 (38.2)	23 (31.1)	64 (39.2)	99 (39.6)	
Very good/Excellent	161 (33.0)	47 (63.5)	57 (35.0)	57 (22.8)	<0.001
How well patient is known by his/her physician (%)^{**}					
Very well	180 (42.4)	25 (37.3)	60 (46.5)	95 (41.5)	
Somewhat	160 (37.6)	28 (41.8)	48 (37.2)	84 (36.7)	0.619
Not at all (new patient)	85 (20.0)	14 (20.9)	21 (16.3)	50 (21.8)	

* Differences across groups are analyzed using chi-square and analysis of variance for categorical and continuous variables respectively.

^a Sample sizes reflect total number of patient participants. Actual sample size is lower for certain characteristics due to item non-response.

** This characteristic is derived from physician responses to a question about how well they know each patient of theirs who is included in this study.

Table 2
 Characteristics of Physicians in Patient-Physician Dyads by *Social Concordance Score*

	Total (N=489) ^a	High Concordance (share 3 or more characteristics) (n=74) ^a	Medium Concordance (share 2 characteristics) (n=163) ^a	Low Concordance (share 1 or fewer characteristics) (n=252) ^a	P- value*
Demographics of Physicians Seen by Study Patients					
<u>Gender of physician seen (%)</u>					
Male	255 (52.1)	37 (50.0)	71 (43.6)	147 (58.3)	
Female	234 (47.9)	37 (50.0)	92 (56.4)	105 (41.7)	0.012
<u>Race of physician seen (%)</u>					
White	274 (56.0)	56 (75.7)	78 (47.9)	140 (55.6)	
African American	139 (28.4)	18 (24.3)	70 (42.9)	51 (20.2)	
Asian	76 (15.6)	0	15 (9.2)	61 (24.2)	<0.001
<u>Has physician done communication skills training?</u>					
Yes	261 (53.4)	41 (55.4)	80 (49.1)	140 (55.6)	
No	228 (46.6)	33 (44.6)	83 (50.9)	112 (44.4)	0.404
<u>Mean Age (SD)</u>	42.6 (7.9)	43.3 (8.3)	43.0 (8.8)	42.1 (7.0)	0.333
<u>Mean (SD) years since MD completed training(%)</u>	10.1 (7.7)	11.0 (7.8)	10.4 (8.6)	9.7 (7.0)	0.359

* Differences across groups are analyzed using chi-square and analysis of variance for categorical and continuous variables respectively.

^a Sample sizes reflect total number of patient participants. Actual sample size is lower for certain characteristics due to item non-response.

Table 3Characteristics of Patient-Physician Dyads by *Social Concordance* Score

	High Concordance (share 3 or 4 characteristics) (N=74)	Medium Concordance (share 2 characteristics) (N=163)	Low Concordance (share 1 or fewer characteristic) (n=252) ^a	p-value
<u>Physician-patient race concordance (%)</u>				
Concordant	73 (98.7)	132 (81.0)	78 (31.0)	
Discordant	1 (1.3)	31 (19.0)	174 (69.0)	<0.001
<u>Physician-patient gender concordance (%)</u>				
Concordant	64 (86.5)	127 (77.9)	89 (35.3)	
Discordant	10 (13.5)	36 (22.1)	163 (64.7)	<0.001
<u>Physician-patient education concordance</u>				
Concordant (patient with 4+ yrs of college)	60 (81.1)	27 (16.6)	12 (4.8)	
Discordant (patient with <4 yrs of college)	14 (18.9)	136 (83.4)	240 (95.2)	<0.001
<u>Physician-patient age concordance</u>				
Concordant (+/-5yrs difference in ages)	41 (55.4)	40 (24.5)	18 (7.1)	
Discordant (>5 yrs difference in ages)	33 (44.6)	123 (75.5)	234 (92.9)	<0.001

* Differences across patient-physician groups are analyzed using chi-square and analysis of variance for categorical and continuous variables respectively.

^a Sample sizes here reflect the total number of patient participants. Actual sample size is lower for certain characteristics due to item non-response

Table 4
Relationship of Patient-Physician Dyad Social Concordance Score to Medical Visit Communication

Total Sample (N=453)	High Concordance (share 3 or more social characteristics) [€] (n=48) ^a	Medium Concordance (share 2 social characteristics) [€] (n=154) ^a	Low Concordance (share 1 or fewer social characteristics) [€] (n=184) ^a
	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)
		P-value*	P-value**
Duration of Visit (minutes)			
Univariate Model	15.95 (13.29–18.62)	15.83 (14.40–17.27)	16.27 (14.72–17.82)
Multivariate Model ^{***}	16.92 (13.97–19.87)	16.10 (14.45–17.76)	15.72 (13.97–17.47)
Speech Speed [‡]			
Univariate Model	24.07 (21.97–26.17)	25.22 (23.78–26.66)	24.86 (23.74–25.98)
Multivariate Model ^{***}	24.56 (22.26–26.85)	25.31 (23.85–26.78)	24.93 (23.65–26.21)
Physician Verbal Dominance ^{‡‡}			
Univariate Model	1.43 (1.30–1.56)	1.55 (1.43–1.68)	1.54 (1.43–1.64)
Multivariate Model ^{***}	1.44 (1.31–1.58)	1.60 (1.45–1.75)	1.58 (1.48–1.69)
Physician Patient-Centeredness [‡]			
Univariate Model	1.29 (1.00–1.59)	1.29 (1.03–1.54)	1.25 (1.09–1.42)
Multivariate Model ^{***}	1.39 (1.04–1.74)	1.32 (1.02–1.63)	1.15 (1.03–1.26)
Patient Positive Affect			
Univariate Model	17.61 (17.05–18.17)	17.10 (16.62–17.59)	17.06 (16.71–17.44)
Multivariate Model ^{***‡}	18.03 (17.47–18.59)	17.16 (16.63–17.69)	17.02 (16.63–17.42)
Physician Positive Affect			
Univariate Model	0.52 (0.20–0.84)	0.64 (0.09–1.20)	0.65 (0.37–0.93)
Multivariate Model ^{***}	0.54 (0.13–0.96)	0.64 (0.01–1.27)	0.64 (0.41–0.87)

[€]The social characteristics are: race, gender, age, and years of education. Dyads share a given characteristic when they concordant as defined in Table 3.

^aThe sample size reflects the number of observations included in most univariate analyses (within 1%). Multivariate analyses include 14–15% fewer cases due to item non-response.

* P-value from GEE for medium concordance vs. high concordance dyads (reference group).

- ** P-value from GEE low concordance vs. high concordance dyads (reference group).
- *** Multivariate Model covariates: individual patient self-rated health status, 1998 vs. 2002 cohort, physician appraisal of how well he/she knows patient.
- ‡ Speech speed = (all patient talk + all physician talk) / visit duration (in minutes).
- ‡‡ Verbal Dominance score = total physician talk / total patient talk.
- ‡‡ Patient-Centered Interviewing score = all psychosocial and socioemotional talk / all biomedical talk
- ‡ p for trend <0.05

Table 5
Relationship of Overall Patient-Physician Social Concordance Score to Patient Perceptions of Care

Total Sample (N=486)	High Concordance (share 3 or more social characteristics)		Medium Concordance (share 2 social characteristics)		Low Concordance (share 1 or fewer social characteristics)	
	Mean (95% CI)	OR (95% CI)	Mean (95% CI)	p-value*	Mean (95% CI)	p-value**
Participatory Decision-Making Score ^f						
Univariate Model	80.40 (76.06–84.75)		81.08 (77.88–84.28)	0.804	78.62 (75.63–81.62)	0.516
Multivariate Model ^{***†}	79.62 (75.14–84.10)		81.49 (78.22–84.76)	0.529	77.96 (74.52–81.40)	0.569
		OR (95% CI)		p-value*		p-value**
Global Satisfaction Rating (1=strongly agree, 0=agree/neutral/disagree) ^π						
Univariate Model [†]	1.21 (0.64–1.79)		0.76 (0.40–1.13)	0.174	0.53 (0.27–0.80)	0.023
Multivariate Model ^{***†}	1.37 (0.72–2.02)		0.80 (0.40–1.20)	0.126	0.64 (0.39–0.89)	0.036
Recommendation of Physician to a Friend (1=strongly agree, 0=agree/neutral/disagree) [¶]						
Univariate Model [†]	1.09 (0.60–1.58)		0.81 (0.42–1.20)	0.344	0.55 (0.26–0.84)	0.051
Multivariate Model ^{***†}	1.37 (0.76–1.98)		0.97 (0.52–1.42)	0.268	0.61 (0.26–0.95)	0.035

^ε The social characteristics are: race, gender, age, and years of education. Dyads share a given characteristic when they are concordant as defined in Table 3.

^d The sample size reflects the number of observations included in most univariate analyses (within 1%), with the exception of participatory decision-making score (n=425). Multivariate analyses include 12–13.5% fewer cases than univariate analyses due to item non-response.

* P-value from GEE for medium concordance vs. high concordance dyads (reference group).

** P-value from GEE low concordance vs. high concordance dyads (reference group).

*** Multivariate Model covariates: individual patient self-rated health status, 1998 vs. 2002 cohort, physician appraisal of how well he/she knows patient.

^f Participatory Decision-Making Score uses patient ratings of physicians' likelihood of giving them choice, control, and responsibility in decision-making (0–100 point scale).

^π Global satisfaction reflects patient responses to: "Overall, I was satisfied with this visit." (5-point Likert scale). The item was dichotomized: 1=strongly agree, 0=less than strongly agree.

[¶] Recommendation of physician to a friend reflects patient responses to: "I would recommend this physician to a friend." (5-point Likert scale). The item was dichotomized: 1=strongly agree, 0=less than strongly agree

† p for trend <0.05

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