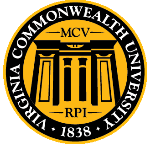

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CARE FOR THE SOCIALLY DISADVANTAGED:
THE ROLE OF RACE AND GENDER ON THE PHYSICIAN-PATIENT RELATIONSHIP
AND PATIENT OUTCOMES IN A SAFETY NET PRIMARY CARE CLINIC

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

By: DANIEL BAUGHN
Master of Science, Virginia Commonwealth University, 2009
Bachelor of Science, University of Florida, 2005

Director: Stephen M. Auerbach, Ph.D.
Professor, Department of Psychology

Virginia Commonwealth University
Richmond, Virginia
October 2012

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Abstract

CARE FOR THE SOCIALLY DISADVANTAGED:
THE ROLE OF RACE AND GENDER ON THE PHYSICIAN-PATIENT RELATIONSHIP AND PATIENT OUTCOMES IN A SAFETY NET PRIMARY CARE CLINIC

By Daniel Baughn, M.S.

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

Virginia Commonwealth University, 2012

Major Director: Stephen M. Auerbach, Ph.D.
Professor, Department of Psychology

Compared to the general population, socially disadvantaged patients have higher rates of chronic illness and require more complex medical care. They also endorse higher levels of psychological distress and tend to engage in behavioral risk factors such as poor diet, physical inactivity, and smoking. These issues are particularly concerning given that this population tends to adhere less to medical recommendations, has limited access to health resources, and receives poorer treatment from providers. In an effort to address this disparity, The Affordable Care Act will expand health care access to an additional 23 million uninsured and 17 million underinsured Americans. However, simply expanding access to health care without examining and improving upon factors related to the physician-patient relationship would not fully address the health care needs of this population. This study sought to improve the quality of care received by socially disadvantaged patients by better understanding the role of race and gender on the physician-patient communication process and patient outcomes in a safety net primary care clinic.

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The study sample consisted of 330 low-income, uninsured/underinsured African American and White patients and 41 resident physicians. Overall, African American patients and their doctors and White doctors and their patients were viewed as engaging in the highest levels of communication. South Asian physicians, and male South Asian physicians in particular, had the lowest levels of communication and the patients of these providers experienced less improvement in their physical health. Patient education level influenced physicians' perceptions of their patients to the extent that patients with higher educational levels were viewed as engaging in lower levels of communication. Last, indicators of a good physician-patient relationship were associated with higher levels of patient reported adherence. Practice implications and areas for future research are discussed.

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Care for the socially disadvantaged:

The role of race and gender on the physician-patient relationship and patient outcomes in a safety net primary care clinic.

Talk is the primary form of communication used in our society. It includes words, communicated facts, emotions, advice, and the social nuances that bring the conversation together. However, as human beings, we often communicate with both verbal and non-verbal expressions such as eye contact, exchanging a handshake, head nods, facial movements, and voice inflection. The combination of both verbal communication and non-verbal expressions contributes to how each individual in an interaction forms and behaves according to an interpersonal stance that is theorized to be a blend of the dimensions of Control (Dominance-Submission) and Affiliation (Friendliness-Hostility) (Kiesler, 1996; Leary, 1957). Interpersonal communication conveys information while simultaneously defining the relationship between two individuals on these dimensions of Control and Affiliation (Kiesler & Auerbach, 2003). Control and Affiliation are evident in a variety of human behaviors, such as parent-child relationships, perceptions of social situations, mate selection, marriage, and physician-patient interactions (Kiesler, 1996).

Physician-patient communication is a thriving, multidisciplinary area of research and has grown even more robust in the last decade as shared decision making and the shift to patient centered care have shaped health care interactions and medical training in the United States (Duggan, 2006; Suchman, 2003). For example, effective physician-patient communication has been shown to significantly influence a patient's response to treatment and has been associated with patient outcomes (Peter Franks, et al., 2006) such as satisfaction with care (Auerbach, Penberthy, & Kiesler, 2004; Campbell, Auerbach, & Kiesler, 2007;

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Hall & Dornan, 1988; Lewin, Skea, Entwistle, Zwarenstein, & Dick, 2001), adherence to treatment (Auerbach, et al., 2002; Malcolm, Ng, Rosen, & Stone, 2003), improved health status (Hall, Roter, Milburn, & Daltroy, 1996; M. A. Stewart, 1995), better psychological adjustment to illness (C. S. Roberts, Cox, Reintgen, Baile, & Gibertini, 1994), and family member satisfaction with care (Wartella, Auerbach, & Ward, 2009).

Despite the large number of studies advancing the field of physician-patient communication, the influence of salient physician and patient characteristics such as race and gender on the health care interaction have not been definitively established. Specifically, our understanding of the influence these characteristics have on interpersonal communication, shared decision making, and the working alliance in the medical setting is ambiguous. The present study contributed to our understanding of how physician and patient race and gender influence the interpersonal, shared decision making, and working alliance processes at work between physicians and patients by evaluating health care interactions in the primary care setting. In addition, this study provided information about how race and gender affect pertinent outcome variables such as patient satisfaction, adherence, and health status. The development of appropriate strategies for the dissemination of knowledge about physician and patient differences in race and gender will be crucial for the delivery of high quality health care.

In the following sections, a brief history of physician-patient communication is presented first, followed by a review of the influence of physician and patient race on the physician-patient interaction. Next, the literature on physician and patient gender is evaluated. In addition, the Interpersonal Circumplex model, its role in the processes of health care, and application to the physician-patient interaction is reviewed. Additionally, the

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Shared Decision Making model, its role in health care, and application to the physician-patient interaction is reviewed. This is followed by a review of the Working Alliance model, its role in health care, and application to the physician-patient interaction. Finally, the hypotheses of the present study are presented in detail.

Brief History of Physician-Patient Communication

The construct of the physician-patient relationship and the expression of the relationship through communication was described by Plato (Hamilton & Huntington, 2005) and has existed in the modern medical and social science literature since the mid 20th century (D. Roter, 2000). Physician-patient communication can be conceptualized as the art of the human interaction between the physician and the patient that most frequently occurs in the medical setting and involves both verbal and nonverbal communication (Teutsch, 2003). Recent changes in health care, such as an increase in the number of patients living with chronic illness, changing reimbursement practices, the Internet, new medical technologies, government regulations, changing social norms that include the rise of consumer driven health care, and rising costs, have influenced the behavior between physicians and patients (American Healthways, 2004). The delivery of medical care in the United States and physician-patient communication are inextricably linked as the system of health care transitions from being organized around acute and episodic illness to one that addresses affordability, accessibility, and accountability (Institute of Medicine, 2001a, 2009). In the sections below, the four models of the physician-patient relationship are described. This is followed by an overview of the patient centered model and its effect upon physician training. Last, the findings from the physician-patient communication literature and methodological limitations are reviewed.

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Four models of the physician-patient relationship. Emanuel & Emanuel (1992) identified three core elements that have been theorized to influence the relational power in the physician-patient interaction. The individual who sets the agenda (i.e. the physician, the physician and the patient in negotiation, or the patient) and the goals of the visit define the first core element. The second core element consists of the role of the patient's values that can be assumed by the physician to be consistent with their own, jointly explored by the patient and the physician, or unexamined by the physician. The last core element is defined by the functional role assumed by the physician (i.e. guardian, advisor, or consultant). The application of these components to the behavior of physicians and patients reveals four behavioral models of typical physician-patient interaction.

Roter (2000) identified mutuality, paternalism, consumerism, and default as models of the physician-patient relationship. High physician and high patient power characterize the mutuality model where the goals and agenda of the visit are negotiated. The patient's values are jointly examined and the physician serves as an advisor or counselor. High physician and low patient power characterize the paternalism model where the physician sets the goals and agenda of the visit. The patient's values are assumed to be similar to the physician's values and the physician serves as a guardian. Low physician and high patient power characterize the consumerism model where the patient sets the goals and agenda of the visit. The physician does not typically examine the patient's values because he or she serves as a type of technical consultant. Low physician and low patient power characterize the default model, which is the result of a dysfunctional standstill between both parties. Specifically, the default relationship is characterized by unclear or contested common goals, obscured or an unclear examination of the patient's values, and an ambiguous role for the physician.

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Mutuality appears to be the optimum relational model for physician-patient interactions (D. Roter, 2000). Questions about the appropriateness of a paternalistic relationship may still exist even in situations where this model has been mutually agreed upon due to the power differential between the physician and the patient. For example, patients may unintentionally adopt a passive role because they are unaware of alternatives or because they are unable to negotiate a more active stance with their physician (President's commission for the study of ethical problems in medicine and biomedical and behavioral research, 1982). The consumerist model may limit physician participation in the decision making process and thus restrain the ability of the physician to provide insight or coping resources to the patient (D. L. Roter & Hall, 2006d). In brief, mutuality, or patient centered care, best recognizes the role of expression, recognition, and reciprocation of emotion and integrates the biomedical and psychosocial perspectives of both the physician and the patient (Beach, Inui, & the Relationship-Centered Care Research Network, 2006; D. Roter, 2000; D. L. Roter & Hall, 2006d).

Patient centered communication. Patient centered communication is characterized by a balanced exchange of information, ideas, and preferences between the physician and the patient with each playing a complementary role during the interaction (Rao, Anderson, Inui, & Frankel, 2007). Patient centered and relationship-centered communication are often used in the literature as interoperable terms, but relationship-centered communication consists of four principles. First, relationships in health care ought to include dimensions of personhood as well as roles. Second, affect and emotion are important components of relationships in health care. Third, all health care relationships occur in the context of reciprocal influence. Last, relationship-centered care has a moral foundation. In summary, both patient and

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relationship-centered communication recognize the role of reciprocity in forming an optimal integration and genuine relationship between the biomedical and psychosocial domains (Beach, et al., 2006; Tresolini & the Pew-Fetzer Task Force, 1994).

It is important to note that there is little consensus on a universal definition of patient centered communication and this may be due to the fragmentation of the field across multiple disciplines (Lewin, et al., 2001; Teutsch, 2003). Several researchers have provided patient centered definitions that include multiple related domains such as exploring both the disease and the illness experience (M. A. Stewart, 1995) and developing the “doctor-as-person” self-awareness (Mead & Bower, 2000). Others have adopted definitions of patient centered communication that represent different public policy (Institute of Medicine, 2001b), economic (J. C. Robinson, 2005), clinical (M. Stewart, et al., 2000; Teutsch, 2003), and patient perspectives (Jennings, Heiner, Loan, Hemman, & Swanson, 2005). In a systematic review of patient centered communication interventions, Lewin et al. (2001) broadly defined patient centered communication to be a philosophy of shared decision making or consultation with the patient where the focus is holistically upon the patient, the patient’s preferences, and the social contexts rather than focusing solely on the disease. The overarching themes of partnership, respect, and decision making appear to be present in all of the definitions of patient centered communication (J. H. Robinson, Callister, Berry, & Dearing, 2008). In summary, multiple components of patient centered communication have been identified, but a mutually agreed upon definition of patient centered communication is needed and this definition needs to be consistently used by researchers. The present study utilized the patient-centered definition developed by Lewin et al. (2001) and by Kiesler and Auerbach (2006) in their review of the patient preference literature.

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Physician competency in patient centered communication is a required aspect of medical training. The Liaison Committee on Medical Education (LCME), an accrediting body for North American programs providing the MD degree, requires that medical students receive specific instruction and evaluation of physician communication skills (Liaison Committee on Medical Education, 2008). Unfortunately, the LCME requirement does not address the specific timing, quality, or quantity of the education (G. Makoul, 2003) and some argue that patient centered physician education should not only focus on skill acquisition, but also on personal reflection and introspection related to the medical encounter (Hulsman, 2009). In 1999, the Accreditation of Council for Graduate Medical Education enacted a new core competency requirement that residents must be proficient in "interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and other health professionals" (Batalden, Leach, Swing, Dreyfus, & Dreyfus, 2002; Horowitz, 2000). In addition, the Institute of Medicine (2001a, 2009) has recommended the use of patient centered care as a key component of a redesigned health care system for the 21st century. In short, patient centered communication is a required competency for new physicians and is viewed as a critical element of the health care system.

Findings from the Physician-Patient Communication Literature

Two types of studies have been conducted to evaluate the relationship between communication and health outcomes: descriptive studies and randomized controlled trials. Patient outcomes that have been evaluated in these studies include (a) disease markers such as hemoglobin A1C, blood pressure, weight, and prostate-specific antigen, (b) survival, and (c) quality of life, which includes functioning and well-being in physical (e.g. the ability to

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walk, subjective ratings of health), psychological (e.g. worry, patient satisfaction), and social domains (e.g. social support).

Cross-sectional and descriptive study findings. The first group of physician-patient communication studies primarily consist of cross-sectional and descriptive studies that report correlations between physician-patient communication and various health outcomes. Beck, Daughtridge, and Sloane (2002), in a review of physician-patient communication in primary care, found that aspects of patient centered care such as empathy, courtesy, and friendliness were positively correlated with patient satisfaction, compliance, comprehension, and the perception of a good interpersonal relationship. Several studies have found clear associations between patient centered communication and lower blood pressure (Orth, Stiles, Scherwitz, Hennrikus, & Vallbona, 1987), better metabolic control in diabetic patients (Auerbach, et al., 2002), reduced patient anxiety (Fogarty, Curbow, Wingard, McDonnell, & Somerfield, 1999), higher quality of life among breast cancer patients (R. L. Street, Jr. & Voigt, 1997), greater satisfaction with and adjustment to dentures (Auerbach, et al., 2004), and better patient (Campbell, et al., 2007) and caregiver satisfaction (Wartella, et al., 2009) . In fact, an early review by Stewart (1995) found significant correlations between communication interventions and patient emotional health, symptom resolution, functional and physiologic status, and pain control. In brief, several cross-sectional and descriptive studies have found correlations between physician-patient communication and biological and psychological patient health outcomes.

Several studies have found little or inconclusive evidence of a relationship between communication and patient disease markers, survival, and the physical domain of quality of life. For example, Stewart and colleagues (2000) found no association between the use of

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patient centered communication by primary care physicians and patient health outcomes. Mark, Byers, and Myers (2001) did not find any evidence supporting a relationship between the interpersonal style of primary care health providers and the patient health outcomes. Hsiao and Boult (2008), in a review of health care quality and primary care outcomes, surmised that there was inconclusive evidence of an association between physician-patient communication and patient mobility, pain, function, mental health, or physical recovery. In fact, the correlations between communication interventions and physical health outcomes found by Stewart (1995) have not been replicated in recent literature reviews (Griffin, et al., 2004; Lewin, et al., 2001). Overall, the literature appears to support the notion that patient centered communication has been associated with psychological outcomes such as patient satisfaction and physician-patient behavior during the consultation. However, the literature does not conclusively support a relationship between patient centered communication and patient disease markers, survival, and the physical domain of patient quality of life. The present study evaluated the relationship between measures of patient centered communication and patient satisfaction, adherence to medical recommendations, health status (e.g. SF-12v2), and patient disease markers such as weight, blood pressure, and hemoglobin A1C.

Randomized controlled trial findings. Randomized Controlled Trials (RCT) are often used to examine the effects of interventions that alter physician and/or patient communication and decision making. Griffin and colleagues (2004) reviewed 35 RCT communication interventions designed to improve the physician-patient interaction and to evaluate the effect of the interventions on patient health outcomes. The authors found that the interventions promoted behaviors theorized to be effective such as patients asking more

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questions and physicians using more patient centered communication. However, only 44% of the included studies had interventions that were associated with improved patient disease markers, survival, or other physical domains of patient health outcome variables.

In a recent review of 36 communication RCT interventions, Rao et al. (2007) concluded that physicians who received communication interventions had higher communication style ratings and exhibited more patient centered communication behavior than controls. Patients who received communication interventions were able to obtain more information from physicians and exhibited greater involvement during visits than controls. However, Rao and colleagues did not assess the influence of the communication interventions upon patient disease markers, survival, or other physical domains of patient health outcome variables. Furthermore, both reviews were limited by interventions with small sample sizes, inconsistent measurement of outcomes, and different effect sizes across studies (Griffin, et al., 2004; Rao, et al., 2007).

Lewin et al. (2001), in a systematic review of interventions for health care providers that promote patient centered approaches, found that patient centered care improved patient satisfaction and that interventions significantly improved the patient-centeredness of the consultation process. Unfortunately, few of the identified studies examined health care behavior or health status outcomes. In summary, reviews of the literature suggest that communication interventions can improve the interpersonal behavior of patients and physicians (Auerbach, 2009; Griffin, et al., 2004; Haywood, Marshall, & Fitzpatrick, 2006; Rao, et al., 2007) and these interventions can improve patient satisfaction (Lewin, et al., 2001). Communication can influence outcome variables that represent the psychological domain of patient health outcomes. However, communication interventions appear to have an

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inconclusive effect upon patient disease markers, survival, and the physical domain of quality of life of patient health outcome variables (Griffin, et al., 2004; Haywood, et al., 2006; Lewin, et al., 2001; Street Jr., Makoul, Arora, & Epstein, 2009).

Methodological limitations. Identifying causal pathways between communication and patient health outcomes has been difficult and this appears to be the result of several methodological limitations. First, most physician-patient communication research findings are correlational in nature and thus causation can only be inferred (Harrington, Noble, & Newman, 2004; Street Jr., et al., 2009). Causal inferences drawn from these studies are confounded by the potential for unknown mediating and moderating variables such as organizational and bureaucratic variance between recruitment sites, selection bias, and unintentional covariates like patient race, socioeconomic status, and gender (Harrington, et al., 2004). In addition, broader determinants known to influence patient health such as treatment access are rarely considered as factors that may influence physician-patient communication (McKinlay, Lin, Freund, & Moskowitz, 2002; D. L. Roter & Hall, 2006e).

Second, it is unclear which elements of most communication interventions are associated with specific outcomes (Street Jr., et al., 2009). Despite identifying key functions of patient centered communication such as trust (de Haes & Teunissen, 2005) and empathy (Lewin, et al., 2001; Neumann, et al., 2009), the methods by which a communication construct influences (or does not influence) the health status of a patient are unknown (Street Jr., et al., 2009). In brief, the relationship between the specific components of communication and patient health outcomes are unknown. Although the current study was descriptive in nature, we attempted to address several of the limitations mentioned earlier by measuring race, gender, interpersonal, shared decision making, and working alliance variables.

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Physician and Patient Race and Ethnicity

It is important to begin the discussion of physician and patient race and ethnicity with accurate definitions of these constructs. Frable (1997) in a review of gender, racial, ethnic, sexual, and class identities defines race as a construct used by social scientists to refer to distinctions drawn from physical appearance such as skin color, eye shape, and physiognomy. Ethnicity refers to individual distinctions based on national origin, language, religion, food, and other cultural markers. Although most studies evaluating race in the physician-patient interaction consistently conceptualize race in a manner consistent with Frable (1997), very few studies make a distinction between race and ethnicity (Meghani, et al., 2009). In fact, a recent systematic review suggests that race and ethnicity are often incorrectly used as interchangeable terms and inconsistently reported in the literature (Ma, Khan, Kang, Zalunardo, & Palepu, 2007). Thus, unless otherwise noted, the studies detailed in this proposal refer to physician and patient race.

Despite improvements in the overall health of Americans, compelling research demonstrates that racial, ethnic, and social disparities in health and health care exist for minority patients even when access related factors such as insurance status and income are controlled (National Center for Health Statistics, 2008; Smedley, Stith, & Nelson, 2003; D. Williams & Mohammed, 2009). For example, African Americans have higher death rates than Whites for most of the 15 leading causes of death in the United States such as heart disease, cancer, stroke, diabetes, kidney disease, hypertension, liver cirrhosis, and homicide (Melonie, et al., 2009). Levine et al. (2001) conducted an analysis on black-white inequalities in mortality and life expectancy on data from 1933 through 1999 and found that almost 100,000 African Americans die prematurely each year and that these individuals would not

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have died if health disparities did not exist. Unfortunately, the health disparity between African Americans and Whites appears to be worsening for certain health outcomes such as heart disease and cancer; the two leading causes of death in the United States (National Center for Health Statistics, 2008; D. R. Williams & Jackson, 2005). Equally important, other minorities such as Latino and Asian American groups experience health disparities such as disproportionately high rates of uninsured individuals and underutilization of preventative care services such as mammography (National Center for Health Statistics, 2008). In brief, minority patients disproportionally experience health disparities even when factors known to influence health status are controlled.

Understanding the interpersonal processes at work in the physician-patient interaction is relevant for minority patients as they may be particularly sensitive to the affective climate of the encounter. Due to historical and personal experiences with discrimination in the health care setting, African American patients appear to be attuned to interpersonal cues from physicians that communicate a sense of care, trust, and partnership (Gamble, 1997). Krieger and Sidney (1996), in a 7 year multisite community cohort study assessing the relationship between blood pressure and self-reported discrimination and unfair treatment, found that 80% of the African American participants reported experiencing racial discrimination in the community. The authors found that discrimination was associated with elevated blood pressure levels in African Americans and that psychosocial experiences such as racial discrimination and unfair treatment may harm health. LaVeist, Nickerson, & Bowie (2000), in a cross-sectional study of satisfaction with medical care by cardiac patients, found that African American patients were more likely to perceive racism and significantly more likely to report mistrust. van Ryn (2002) identified extensive evidence of patient and physician race

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influencing rates of kidney transplantation, cardiac care, psychiatric treatment, and the treatment of pain in minority patient populations. She proposed an interrelated set of hypothesized causal pathways of how provider beliefs about patients and provider behavior during encounters may be influenced by patient race/ethnicity. Furthermore, a recent meta-analytic review of perceived discrimination and health by Pascoe and Smart Richman (2009) found that perceived racism negatively influences both mental and physical health. Perceived discrimination significantly increases stress responses and is related to participation in unhealthy behaviors and nonparticipation in healthy behaviors. In brief, the interpersonal processes at work in the interaction between physicians and minority patients appear to influence patient health outcomes.

Brown and colleagues (2007) proposed three explanations for why physician and patient race may influence communication patterns and information exchange. First, patients may prefer same race physicians because they may be able to better relate on an interpersonal level. In addition, the racial similarity may facilitate information exchange and cues that are conducive to partnership building (Brach & Fraser, 2000; L. A. Cooper, et al., 2003; T. A. LaVeist, et al., 2000). Using data from the Commonwealth Fund 1994 National Comparative Survey of Minority Health Care, a random telephone survey of 3,789 adults in the 48 contiguous states, Saha and colleagues (2000) found that black and Hispanic Americans sought care from physicians of their own race because of personal preference and language preference. LaVeist and Carroll (2002) used the same 1994 Commonwealth Fund data and found African American patients who had the ability to chose their own physician were significantly more likely to chose an African American provider. In brief, it appears that

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minority patients, when provided with the option, prefer to receive care from same race physicians.

Second, physicians may maintain negative stereotypes about patients from certain social groups and this could reduce efforts to engage patients in high quality communication (J. L. Johnson, et al., 2004; van Ryn, 2002; Whaley, 2001). For example, van Ryn and Burke (2000) found that physicians perceived African American patients to be more likely to abuse illicit substances, to be noncompliant with medical advice, and to lack social support than White patients. Moreover, physicians perceived African American patients to be less educated, less motivated to be physically active, and less likely to be "the kind of person they could see themselves being friends with." Unfortunately, systematically studying provider bias can be uncomfortable for health care practitioners and researchers given that the literature has demonstrated that they are susceptible to having prejudices and stereotypes about minority patients (Bogart, Catz, Kelly, & Benotsch, 2001; Rathore, et al., 2000; Thomson, 1997; van Ryn & Burke, 2000).

Last, physicians may mistreat patients who have a background that is foreign to the provider, patients with backgrounds they dislike, and patients who violate the cultural norms of the treatment setting (Bach, Cramer, Warren, & Begg, 1999; Brach & Fraser, 2000; J. L. Johnson, et al., 2004). For example, Johnson and colleagues (2004) found that Black, Asian, and Hispanic patients felt that they would have received better care if they belonged to another race. In addition, these patients felt that they were unfairly judged and treated with less respect by the medical staff because they were minorities and spoke English less proficiently. Collins et al. (2002), in a 2001 survey by The Commonwealth Fund on health care quality, found that 15% of African Americans believed that they would receive better

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care if they were of a different race or ethnicity. Wynia and colleagues (2003), in a self-administered survey of 720 physicians from the American Medical Association, found that physicians with larger volumes of Medicaid patients reported sometimes not offering their patients useful services due to perceived patient coverage restrictions. African Americans are five times more likely that Whites to be covered by Medicaid (Watson, 2001). In summary, minority patients, and African Americans in particular, appear to be acutely aware of racial discrimination and unfair treatment in the medical setting and this may be one reason why they tend to prefer same race providers. Equally important, physicians appear to be susceptible to prejudicial stereotypes and may act upon these beliefs to the detriment of minority patients.

While many factors are believed to influence the health and health care disparities experienced by minorities, recent research has focused on how race and ethnicity influence the physician-patient interaction and pertinent patient health outcomes. A report by the Institute of Medicine suggests that aspects of the physician-patient interaction such as poor cultural match, miscommunication, patient and physician attitudes, and mistrust may contribute to the health disparities experienced by minority populations (Smedley, et al., 2003). The physician-patient research literature on race and ethnicity has primarily focused on the concept of race concordant (for example, an African American patient who visits an African American physician) and discordant (for example, an African American patient who visits a White physician) physician-patient interactions. The fundamental crux of race concordance rests on the assumption that underlying racial and ethnic health disparities can be ameliorated by the increased mutual respect, trust, communication, and satisfaction that are thought to occur more frequently in race concordant physician-patient interactions. In

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more general terms, are patients better able to relate, understand, and collaborate more effectively with a physician who shares the patient's values and culture (Meghani, et al., 2009; Schouten & Meeuwesen, 2006)? Due to the paucity of research actively evaluating the role of race in the physician-patient interaction, several studies (King, Wong, Shapiro, Landon, & Cunningham, 2004; McKinlay, et al., 2002; Modi, Whetstone, & Cummings, 2007) and public opinion (Collins, et al., 2002; R. L. Johnson, S. Saha, et al., 2004) appear to support the idea that race concordant interactions have a positive effect on minority patient health care. In fact, the Institute of Medicine has recommended that the most direct strategy to improve the health care experience for ethnic minorities is to increase the proportion of underrepresented racial and ethnic minorities among health professionals (Smedley, et al., 2003). The research supporting the notion that race concordance influences minority patient health outcomes is detailed below.

Concordance and Minority Patient Outcomes

Meghani et al.(2009), in a comprehensive review of physician-patient race concordance studies from 1980 through 2008, surmised that there was inconclusive evidence to suggest that race concordance was associated with positive health outcomes for minority patients. The authors identified 27 studies that met the eligibility criteria of including at least one hypothesis examining the effect of physician-patient race concordance on minority patient health outcomes. The authors concluded that race concordance had inconsistent and thus inconclusive effects on the provision of health care to and the utilization of health care by minority patients. The authors found "no clear pattern" of findings on physician-patient communication, patient satisfaction, patient preference, and patient's perception of respect but did conclude that there was a trend towards a positive association between these

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outcomes and race concordance. The studies associated with the minority patient outcomes that were evaluated in the present study are reviewed below.

Patient centered communication. Several studies suggest that race concordance has a positive effect upon patient centered communication with minority patients. For example, Cooper-Patrick et al. (1999), in a telephone survey of 1,816 adults who recently attended an urban primary care practice in the Washington D.C. metro area, found that patients in race concordant interactions rated their visit as significantly more participatory than patients in race discordant interactions. African American and other minority patients reported less participatory visits with White physicians. Ghods et al. (2008) , in a study comparing patient–physician communication patterns for 108 African American and White patients who had high levels of depressive symptoms, found that rapport-building exchange was higher in race concordant visits. Cooper et al. (2003), in a cohort study of 252 adult patients receiving care from 31 physicians in the Baltimore-Washington D.C. metro area, found that race concordance was associated with physicians being viewed as more participatory and with visit lengths that were on average 2 minutes longer than discordant visits even after controlling for age, socioeconomic status, and poor health status. In addition, concordant visits were rated by coders to contain higher levels of positive affect, which the authors theorized may be the result of “mutual liking and respect”, “social or racial group affiliation and enhanced trustworthiness”, or “positive expectations”. These factors have been found to influence both physician and patient positive affect (Hall, Horgan, Stein, & Roter, 2002; R. L. Johnson, Roter, Powe, & Cooper, 2004) and a meta-analytic review of physician communication found that positive affect was associated with patient satisfaction and adherence (Hall, Roter, & Katz, 1988).

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Several studies suggest that race concordance does not influence patient centered communication with minority patients. For example, Brown et al. (2007) examined the communication patterns of 28 encounters between 21 private-practice pediatricians and 38 parents whose children were referred for psychosocial problems consistent with attention deficit disorder (ADD) or attention deficit hyperactivity disorder (ADHD). The authors found little evidence that patient-centeredness varied by race and instead discovered that education concordance was associated with higher levels of patient-centeredness. Education concordance was defined as an interaction where parents had at least a college degree. Gordon, Sharf, and Souchek (2006) found that racial discordance, after controlling for patient participation and other factors, did not predict differences in information giving by physicians to patients with pulmonary nodules or lung cancer. Clark, Sleath, and Rubin (2004) examined the association of ethnicity and language concordance with physician-patient agreement about recommendations for diet, exercise, medication, smoking, stress, and weight. The authors evaluated audio-recorded interactions between 27 residents and 427 patients and found that ethnicity concordance was not associated with physician-patient agreement about recommended lifestyle changes. In fact, language concordance had a positive effect on the likelihood of agreement about exercise and a negative effect on the likelihood of agreement about medications. In summary, there does not appear to be a clear pattern of findings that support the association between race concordance and patient centered communication. However, Meghani et al. (2009) concluded that there does appear to be a trend in the positive direction.

Although Meghani et al. (2009) did not specifically evaluate shared decision making, several studies suggest that aspects of shared decision making are associated with patient

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race. For example, Cooper-Patrick et al. (1999) found that race concordance was associated with higher levels of participatory decision making. Johnson et al. (2004) found that physicians engaged in 33% less patient-centered communication with African American patients than with White patients. Oliver and colleagues (2001) found that physicians spent less time during visits planning treatment, providing health education, chatting, assessing patients' health knowledge, and answering questions when with African American patients as compared to White patients. Sanchez and colleagues (2007), using qualitative methods, identified several cultural and racial themes implicated in the decision making for prostate cancer screening by African American men. The identified themes share several similarities with aspects of shared decision making such as providing medical information and collaboratively working with the physician to make a treatment decision. The Impact Message Inventory (IMI), Participatory Style of Physician Scale (PSPS), and the Physician-Patient Working Alliance (PPWA), measures frequently used to evaluate the physician-patient relationship (Fuertes, Boylan, & Fontanella, 2009; Fuertes, et al., 2007; Kiesler & Auerbach, 2003, 2006) was used to assess the interpersonal component of patient centered communication in this study.

Patient satisfaction. A pattern of findings suggests that race concordance has a positive influence upon patient satisfaction. Data from the 1994 Commonwealth Minority Health Survey suggests that patient satisfaction increases with same race providers (T. A. LaVeist & Carroll, 2002; Thomas A. LaVeist & Nuru-Jeter, 2002; Somnath Saha, Komaromy, Koepsell, & Bindman, 1999). Furthermore, several studies have found a positive association between race and patient satisfaction (Cooper-Patrick, et al., 1999) and ratings of care (L. A. Cooper, et al., 2003). In contrast, Saha et al. (2003), in a survey of minority health

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care quality, found that Hispanic and Asian patients reported lower rates of satisfaction than African American patients. However, this relationship may be an artifact of the finding that African American patients received, on average, more services than Hispanic or Asian patients. In brief, race concordance appears to have a positive influence upon patient satisfaction (Meghani, et al., 2009). Patient satisfaction was assessed using the Medical Patient Satisfaction Questionnaire (MPSQ; Fuertes, et al., 2007) as it provided a measure of patients' global satisfaction with various realms of treatment (e.g., appointment making, administrative and staff, and quality of physician's medical treatment).

Patient adherence. Patient adherence is defined as the extent to which the patient engages in behaviors relevant to self-set, mutually negotiated, and/or physician-set goals (Hall & Roter, 2007). There is little conclusive evidence that suggests a relationship between patient adherence and patient characteristics, such as race, despite considerable effort aimed at understanding the underlying factors associated with adherence failure (Christensen & Johnson, 2002). In fact, patient race was not even considered as a potential moderator of adherence in a recent quantitative review of the patient adherence literature (DiMatteo, 2004). Several communication studies have not found a relationship between race and patient adherence. Van Wieringen, Harmsen & Bruijnzeels (2002) evaluated the influence of communication and patient beliefs on understanding and compliance of native-born and ethnic minority patients in the Netherlands and did not find a relationship between patient race and compliance behaviors. Fuertes et al. (2007) evaluated the relationship between race, the working alliance, and patient adherence in minority patients and did not find an association between race and adherence.

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Some studies suggest that race concordance may influence patient adherence. Konrad and colleagues (2005), in study evaluating the effects of physician-patient racial concordance and continuity of care on hypertension outcomes, found contextually conditioned race interaction effects. For example, African American patients who used public sources of care were more likely to use their hypertension medications if their physician was African American. In addition, African Americans who switched physicians were more likely to use their hypertension medications if their new physician was White. In brief, the literature does not consistently support a relationship between patient race and patient adherence. Patient adherence was assessed using the Medical Outcomes Survey Measures of Patient Adherence (MOS-5; Hays, 1994) as it provided a global indication of patient adherence and has been used in the physician-patient communication literature (Fuertes, et al., 2009; Fuertes, et al., 2007).

Perceived health status. Meghani et al. (2009) concluded from their review of the literature, that there is inconclusive evidence to support that physician-patient race concordance was associated with positive health outcomes for minorities. In fact, the authors iterated that more research is needed to understand what health outcomes may be more sensitive to cultural proximity between physicians and patients, and what patient, provider and setting-level variables may moderate or mediate these outcomes. A recent study assessing the relationship between physician-patient race concordance and self-reported general health and the SF-12 measures of physical and mental health in a community-based sample of 2001 adults found that race concordance was only associated with general health status for White respondents (Kumar, Schlundt, & Wallston, 2009). The authors postulated that socioeconomic status and access to quality health care were more likely to influence

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perceived health status than physician-patient race concordance or discordance. Patient health status was assessed using the SF-12v2 as it was a reliable measure of physical and mental health status in patients (Ware, 2008; Ware, Kosinski, Turner-Bowker, & Gandek, 2002) and was the most widely used tool in clinical trials and in other group-level comparisons to assess patient health outcomes (Garratt, Schmidt, Mackintosh, & Fitzpatrick, 2002).

Patient biological variables. An extensive search of the PubMed and PsycINFO databases identified only one study that has evaluated the relationship between physician-patient race concordance and patient biological outcome variables. Traylor and colleagues (2010) assessed the association of physician and patient race concordance on cardiovascular disease risk factor levels and treatment intensification in a large cohort of diabetic patients in an integrated delivery system. The authors evaluated patient biological variables such as hemoglobin A1C, LDL cholesterol, and systolic blood pressure and found that African American patients had worse risk factor control for hemoglobin A1C, LDL cholesterol, and systolic blood pressure than White patients. However, the authors found that race concordance was not associated with the patient biological outcomes or treatment intensification. The author of the current study was unaware of any additional studies assessing the relationship between physician-patient race concordance and patient biological measures. The current study assessed the relationship between physician and patient race (and race concordance) and weight, BMI, hemoglobin A1C, blood pressure, cholesterol levels, and vaccination status (as appropriate depending on upon the patient's diagnosis/presenting problem).

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Association of Race Concordance with Negative Outcomes for Minorities

Race concordance may be less than beneficial for some minority groups. Intra-racial racism is defined as racism that occurs "when an individual is discriminated against because of their race by a member of their own ethnic/racial group" (Paradies, 2006). Social psychology research suggests that members of oppressed racial groups are more likely to consider negative behaviors from members of their own racial group to be more discriminatory than similar behaviors from other racial groups (Major, et al., 2002). A recent survey of minority patients from primary care clinics in New York City found that 28% of African Americans and 15% of Latinos reported intra-racial racism as the most prevalent form of racism they experienced (Brondolo, et al., 2005). Din-Dzietham and colleagues (2004), in a study assessing the relationship between blood pressure and racism towards African Americans from same race and different race peers, found that intra-racism stress was more strongly associated with increased blood pressure than inter-racial racism (i.e. the perpetrator and the target are from different ethnic/racial groups). However, other studies have not found an association between perceived discrimination and blood pressure (C. Brown, Matthews, Bromberger, & Chang, 2006; D. Williams & Mohammed, 2009). Furthermore, the relationship between exposure to discrimination and the sustained elevation of blood pressure in not well understood (D. Williams & Mohammed, 2009). In brief, research suggests that intra-racial racism may unintentionally influence acute patient health outcomes in race concordant physician-patient interactions

Several studies have found a negative relationship between race concordance and minority patient outcomes. Blanchard et al. (2007) as well as Schnittker and Liang (2006) found that race concordance was associated with disrespect and racism in African American

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and Hispanic patients. Tai-Seale et al. found that elderly patients with same race primary care physicians were less likely to be assessed for depression. The authors posited that this oversight in patient care may have be due to the physician and patient having a shared culture that may discourage the detection and discussion of certain medical problems. In summary, race concordance has been associated with negative psychosocial patient outcomes.

In summary, the literature suggests that race concordance may negatively influence patient outcomes (Blanchard, et al., 2007; Brondolo, et al., 2005; Schnittker & Liang, 2006; Tai-Seale, et al., 2005). The variability of genetics (Bamshad, Wooding, Salisbury, & Stephens, 2004), culture, and value systems (Frable, 1997), within racial groups far exceed the variability between racial groups. Race concordant physician-patient interactions are subject to the complex interactions between socio-demographic, social, and psychological factors (Meghani, et al., 2009; Paradies, 2006; van Ryn, 2002). Thus, the assumption that race concordance is associated with improved physician-patient communication and improved patient outcomes may not be valid for all minority patients and physicians (Barksdale, 2009). This study evaluated both physician and patient race and ethnicity using Federal Government categories. Self-reported race and ethnicity has been identified as the "gold standard" (Ma, et al., 2007) and was assessed using a demographic form and concordance was evaluated using statistical techniques that are discussed in the method section.

Physician and Patient Gender

Gender has been shown to influence the physician-patient relationship (D. L. Roter & Hall, 2004; D. L. Roter, Hall, & Aoki, 2002). In the following sections we discuss the increasing percentage of women in the physician workforce. We then review the literature on

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how gender affects the communication between physicians and patients with a specific emphasis on the domains of patient centered care. Last, we discuss the growing number of studies that have evaluated the influence of gender on physician-patient dyads.

Women compose a significant percentage of medical school applicants, graduates, and practicing physicians. In fact, females comprised 49% of all U.S. medical school applicants in 2008 (Leadley, Magrane, Lang, & Pham, 2008) and projections suggest that women will represent 55% of Caucasian and Asian applicants, 60% of Hispanic applicants, and almost 70% of African American medical school applicants by 2020 (R. A. Cooper, 2003a, 2003b). In 2008, 49.4% of medical school graduates were female (Leadley, et al., 2008) and female physicians comprise 27.8% of the total physician population (Smart, 2009). Furthermore, more than half of all residents in primary care specialties (e.g. Internal Medicine, Family Medicine, Pediatrics, and Obstetrics and Gynecology) are female (Salsberg, Rockey, Rivers, Brotherton, & Jackson, 2008).

In summary, women compose an increasing percentage of the physician work force and constitute more than half of all primary care residents. Several studies suggest that women appear to utilize self-disclosure (Dindia & Allen, 1992), encourage conversation, express empathy, and are more accurate judges of others' feelings than men (Hall, 1990). Female physicians demonstrate these characteristics (D. L. Roter & Hall, 2006a) and these attributes may be more advantageous to certain groups such as female patients (Bertakis, 2009; Hooper, Comstock, Goodwin, & Goodwin, 1982). In the following sections we review the evidence base of physician and patient gender upon the physician-patient interaction. The findings have been grouped according to the domains of patient centered care evaluated in

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the current study, which have been identified in two extensive meta-analytic reviews of the literature (D. L. Roter & Hall, 2004; D. L. Roter, et al., 2002).

Patient education and counseling. Patient education and counseling is defined as the use of information and counseling skills to strengthen the ability of patients to comprehend and cope with their medical condition in addition to being cognizant of the lifestyle changes that may result from the ailment and/or treatment (D. L. Roter & Hall, 2004). Physician gender does not appear to influence levels of biomedical counseling with patients. However, female physicians tend to engage in higher levels of psychosocial discussion with patients than male counterparts (Bertakis, 2009; D. L. Roter & Hall, 2004). Patients of female physicians tend to engage in more biomedical and psychosocial disclosure than patients of male physicians. In brief, female physicians engage in more psychosocial discussion and patients of female physicians engage in more psychosocial and biomedical disclosure (D. L. Roter & Hall, 2004). The Participatory Style of Physician Scale (PSPS) assessed elements (e.g. providing medical information, gathering personal information) of patient education and counseling in this study.

Partnership building. Partnership building is defined as communication that encourages patients to assume an active role in the physician-patient interaction through active (e.g. asking the patient's opinion) or passive methods (e.g. assuming a less verbally dominate position in the interaction) (D. L. Roter & Hall, 2004). Female physicians tend to engage in higher levels of partnering behaviors than male physicians (Cooper-Patrick, et al., 1999; D. L. Roter & Hall, 2004). However, the literature does not support a relationship between physician gender and lower levels of physician dominance. In addition, there does not appear to be a relationship between patient partnership-building behaviors and physician

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gender. In brief, female physicians utilize higher levels of partnership behaviors and patient partnership-building behaviors are not influenced by physician gender. The Impact Message Inventory (IMI), Participatory Style of Physician Scale (PSPS), and Physician-Patient Working Alliance (PPWA) were used in this study to assess the interpersonal, shared decision making, and working alliance aspects of emotionally responsive communication.

Emotionally responsive communication. Emotionally responsive communication is defined as the use of emotional statements and nonverbal cues to convey emotional content such as verbally expressing empathy and reassurance or using a friendly voice tone and smiling when interacting with a patient (D. L. Roter & Hall, 2004). Female physicians tend to utilize higher levels of emotional talk than male physicians in the primary care setting while the opposite is true in the obstetrics and gynecology setting. The literature does not support a relationship between physician gender and patient emotional talk. Female physicians tend to engage in higher levels of positive talk than male physicians and patients of female physicians tend to engage in higher levels of positive talk (e.g. statements of agreement). Female physicians tend to demonstrate higher levels of nonverbal behavior such as head nods and smiling than male physicians. The literature does not support a relationship between physician gender and patient nonverbal communication. However, patients do appear to be more assertive with female physicians than male physicians. There were no significant physician gender effects on physician or patient levels of negative talk or social communication. In addition, the literature consistently reports that female physicians tend to conduct longer medical visits than male physicians (D. L. Roter, et al., 2002).

Overall, the literature suggests that male and female physicians interact with patients differently. Female physicians tend to engage in more affective behaviors that can be

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considered patient centered (D. L. Roter & Hall, 2004) such as involving patients in decision making (Elstad, 1994) and are more likely than male physicians to gather information about psychosocial issues (D. L. Roter & Hall, 2006c). Male physicians are more likely to direct the medical visit, to use medical jargon, and to focus more discussion on medical conditions than female physicians (D. L. Roter, et al., 2002). However, it is important to note that gender differences between male and female physicians are small in magnitude and that male and female physicians are generally more similar than different in communication (Hall & Roter, 1998; D. L. Roter & Hall, 2001). Thus, it would be erroneous to infer that female physicians are more patient focused or better health care providers than male physicians (Richard L. Street, 2002). In fact, Bertakis, Franks, and Epstein (2009), using independent raters, found that male physicians better understand "the whole person" while female physicians spend more time "exploring both the disease and illness experience". The authors found that, overall, male and female physicians tend to engage in the same level of patient centered communication. The Impact Message Inventory (IMI) was used to assess elements of emotionally responsive communication such as the interpersonal role of control and affiliation behaviors.

Gender Concordance and Communication

The majority of physician-patient communication studies have focused on physician gender and have neglected the influence of patient gender upon the physician-patient interaction (D. L. Roter & Hall, 2004; D. L. Roter & Hall, 2006c). Several researchers (Bertakis, et al., 2009; Flocke & Gilchrist, 2005; Gross, et al., 2008) have adopted the use of the terms "gender concordance" and "gender discordance" to refer to same and opposite gender physician-patient dyads. In the following sections we first review the evidence base

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for studies that have found an effect for concordance. Next, we review the studies that have found a relationship between discordance and the physician-patient relationship. Last, we review studies that have not found an effect for concordance or discordance.

Patient centered communication. Gender concordance has been associated with correlates of patient centered communication such as interpersonal behavior and patient trust. Female concordant physician-patient interactions have been associated with lower levels of physician verbal dominance than male concordant interactions (Brink-Muinen, Dulmen, Messerli-Rohrbach, & Bensing, 2002; Hall, Irish, Roter, Ehrlich, & Miller, 1994). Brown and colleagues (2007) found that parents in pediatrician-parent gender concordant dyads engaged in more biomedical question asking and the authors posited that this may be the result of parents feeling more comfortable in gender matched encounters. In short, there appears to be a relationship between gender concordance and lower levels of physician dominance in female concordant interactions and patient biomedical question asking.

Gender concordance has been associated with more positive perceptions of the physician-patient interaction and higher levels of patient trust. Bertakis et al. (2009) found that gender concordance was associated with higher independent coder ratings of the physicain's ability to "understand the whole person." Gross et al. (2008) found that female patient/female physician dyads had a positive association with physician ratings of high rapport and a negative association with physician perception of uncertainty about diagnosis. Babitsch and colleagues (2008) found that gender concordance had slight effects upon the physician's satisfaction with the course of treatment. DiMatteo, Murry, and Williams (2009) found that male physicians tended to be more positive to male patients and female physicians tended to be more positive to female patients. In addition, physicians tended to express more

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positive affect in gender concordant than discordant encounters. Bonds and colleagues (2004) found that gender concordance between resident and physician was a significant predictor of high levels of patient trust. However, patients who received care from female residents were less likely to report high levels of trust.

Gender concordance has been associated with poor participatory decision making. For example, Kaplan and colleagues (1995) conducted a study of patient characteristics associated with decreased mutual decision-making between physicians and patients. The authors found that male patients of male physicians (e.g. gender concordance) were viewed as less participatory than female patient / female physician and male patient / female physician dyads. In fact, male gender concordant physician-patient visits were significantly less participatory than female gender concordant visits.

In summary, there is a need for more studies evaluating the influence of gender concordance on physician-patient communication (Bertakis, 2009). Some studies suggest that gender concordance has a positive influence upon physician perception of the patient, physician rapport with the patient, and patient trust; all of which are important elements of the interpersonal, shared decision making, and working alliance aspects of the physician-patient relationship. No studies have evaluated the relationship between gender concordance and interpersonal, shared decision making, and working alliance aspects of the physician and patient relationship. The Impact Message Inventory (IMI), Participatory Style of Physician Scale (PSPS), and the Physician-Patient Working Alliance (PPWA) was used to assess patient centered communication in this study as these measures are frequently used to evaluate the physician-patient relationship (Fuertes, et al., 2009; Fuertes, et al., 2007; Kiesler & Auerbach, 2003, 2006).

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Patient satisfaction. The research literature does not clearly support an association between gender concordance and patient satisfaction. Studies suggest that some patients are more satisfied with female physicians (Bernzweig, Takayama, Phibbs, Lewis, & Pantell, 1997; Bertakis, Helms, Callahan, Azari, & Robbins, 1995) while other patients are more satisfied with male doctors (Ross, Mirowsky, & Duff, 1982). Other studies suggest that patients are more satisfied with female doctors but by male patients only or with male doctors but by female patients only (J. Schmittdiel, Grumbach, Selby, & Quesenberry, 2000). Some studies suggest that gender concordance is positively associated with patient satisfaction as a whole (Cooper-Patrick, et al., 1999) while other studies suggest that specific gender dyad status (e.g. female physician with a female patient) is associated with higher levels of patient satisfaction (Gross, et al., 2008). Further research is needed to evaluate the influence of gender concordance upon patient satisfaction. In brief, certain patient groups tend to be more or less satisfied with same gender or opposite gender physicians. These findings are somewhat contradictory and it is not well understood how gender concordance may influence patient satisfaction.

Patient adherence. An extensive search of both PubMed and PsycINFO found only one study that had evaluated the relationship between gender concordance and adherence or compliance. Schmittdiel et al. (2009) examined the relationships between patient gender, physician gender, and their interaction with cardiovascular disease risk factor control, medication adherence, and treatment intensification in 157,458 diabetic patients. The authors did not find a relationship between gender concordance and adherence. Further research is needed to evaluate the influence of gender concordance upon patient adherence. Patient adherence was assessed using the Medical Outcomes Survey Measures of Patient Adherence

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(MOS-5; Hays, 1994) as it provided a global indication of patient adherence and has been used in the physician-patient communication literature (Fuertes, et al., 2009; Fuertes, et al., 2007).

Perceived health status. An extensive search of both PubMed and PsycINFO found only one study that had evaluated the relationship between gender concordance and perceived or self-reported patient health status. Cooper-Patrick et al. (1999) assessed gender concordance and patient health status using a self-rated perceived health question (5-point scale from poor to excellent). Unfortunately, the authors did not report any findings on the relationship between concordance and health status. Thus, the conclusion drawn from this omission is that the relationship was not significant. Perceived health status was assessed in this study using the SF-12v2 as it provided a measure of eight patient health domain scales and two component summary scales: physical health and mental health (Ware, et al., 2002).

Patient biological variables. An extensive search of both PubMed and PsycINFO found only one study that had evaluated the relationship between gender concordance and patient biological variables. Schmittdiel et al. (2009) examined the relationships between patient gender, physician gender, and their interaction with cardiovascular disease risk factor control, medication adherence, and treatment intensification in 157,458 diabetic patients. The authors found that female patients of female physicians were more likely than any other gender dyad to have improved hemoglobin A1C control. In addition, the authors found trends that suggest this dyad has better LDL cholesterol and systolic blood pressure (SBP) control and may be more likely may be more likely to receive treatment intensification for all three cardiovascular risk factors (e.g. A1C, LDL, SBP) than female patients of male PCPs. Patient biological variables were assessed in this study using data from patient medical records.

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Gender discordance. Gender discordance refers to opposite gender physician-patient dyads. Several studies suggest that gender discordance may have negative effects on certain physician-patient interactions. For example, Gross et al. (2008) found that female physician/male patient dyads had a positive association with physician perception of uncertainty about diagnosis and a negative association with physician perception of the patient's condition of high severity. Beran and colleagues (2007), in a review of data from the HIV Cost and Services Utilization Study, found that gender discordance was associated with patient perceived problems of being treated with respect by clinicians. Bischoff, Hudelson, and Bovier (2008), in a study of 363 physician-patient interactions with foreign language speaking patients found that discordance was associated with lower overall ratings of the quality of communication when interpreters were not used. In brief, gender discordance in certain interactions has been associated more concerning physician perceptions, reduced patient respect, and lower communication quality.

Concordance and/or discordance do not influence the interaction. Several studies suggest that gender concordance and discordance do not appear to influence patient centered communication. Flocke and Gilchrist (Flocke & Gilchrist, 2005), found that gender concordance was not associated with the delivery of counseling to patients. Bertakis et al. (2009) found that there were no significant differences in patient centered communication for gender concordant or discordant interactions. Cooper-Patrick et al. (1999) found that gender concordance had no effect upon participatory decision making. Katz and colleagues (2007) found that gender concordance was not associated with the patient question asking behavior during the physician-patient visit.

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In summary, several patterns of both physician and patient behavior have been associated with gender concordance. Some of these patterns appear in certain physician-patient encounters such as the preference for female physicians by female patients and these patterns suggest the presence of a better working alliance. However, other findings suggest that gender concordance and/or discordance has mixed effects upon patient satisfaction. The present study assessed the role gender concordance and discordance on the interpersonal, shared decision making, and working alliance communication between the physician and the patient.

Physician-Patient Gender Dyads and Communication

The first systematic review on the influence of physician-patient gender dyads on the doctor-patient relationship appeared in late 2009 (Sandhu, Adams, Singleton, Clark-Carter, & Kidd, 2009). Prior to Sandhu et al. (2009), there were no reviews on the influence of both physician and patient gender on the physician-patient relationship (Bertakis, 2009). The existing literature evaluated the role of gender by using gender concordance and discordance as homogenous categories. Unfortunately, the term gender concordance assumes that male physician/male patient dyads and female physician/female patient dyads have the same impact when the literature suggests that there are discernable differences between gender concordant groups (Sandhu, et al., 2009). The use of gender concordance and discordance does not provide a complete framework to evaluate the differences between same gender and opposite gender dyads.

Sandhu et al. (2009) identified four physician-patient dyads: male physician/male patient (M/M), male physician/female patient (M/F), female physician/female patient (F/F), female physician/male patient (F/M). Overall, the physician-patient dyad findings suggest

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that there is less tension around power and status within same sex dyads (e.g. M/M and F/F). However, female physicians who interact with female patients (e.g. F/F) tend to converse using more technical bio-medical language while maintaining a warm and patient-centered communication style. Sandhu et al. (2009) suggested that female physicians tend to behave more like stereotypical male physicians when interacting with female patients as this relationship does exist in other environments where females in leadership roles interact with female employees (Carbonell, 1984). In contrast, opposite sex dyads (e.g. M/F and F/M) are characterized by less ease between dyad participants. Power inequalities between male and female dyad members are particularly pronounced in M/F dyads where male physicians tend to make more presumptions, utilize more interventionist behaviors, and utilize less self-management discussion. Although tension is present in F/M dyads, there are verbal and nonverbal behaviors that suggest female physicians are seeking to collaborate and engage male patients (who show signs of boredom) while maintaining control of the interaction (Sandhu, et al., 2009).

Unfortunately, very few of the physician-patient interaction studies specifically evaluate the effect of physician and patient gender on the actual physician-patient interaction. In fact, Sandhu et al. (2009) found only 10 communication studies (out of 648 identified) conducted between 1960 and 2007 that specifically evaluated gender interaction effects. The current study evaluated the effects of physician and patient gender on interpersonal, shared decision making, and working alliance domains in the physician-patient interaction and patient outcomes using the gender concordance and discordance categories. Exploratory analyses evaluated the role of the four dyad groups.

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Application of the Interpersonal Circumplex Model to Health Care

In order to understand the interpersonal aspects of the physician-patient interaction, this study applies Kiesler's (1983) version of the Circumplex model of interpersonal behavior. This model focuses on the interpersonal dimensions of affiliation and control and the extent to which there is a complementary match on these dimensions between interactants. Hypotheses derived from this model have been validated with some success when applied to physician-patient consultations (Kiesler & Auerbach, 2003) and health care provider-family member interactions in the critical care setting (Auerbach, et al., 2005; Wartella, et al., 2009). This study focused on the interpersonal interaction between the physician and the patient.

Originally conceptualized by Leary (1957) for personality evaluation, the Interpersonal Circumplex model provides the theoretical backbone for studies in personality, psychopathology, psychotherapy, and medicine (Kiesler, 1996; Kiesler & Auerbach, 2003). The theory serves as a conceptual and empirical framework for integrating the body of research that supports control and affiliation as foundational aspects of human interpersonal behavior. The theory rests on two critical aspects as applied to the interactions in health care settings. The first aspect is that the mix of control or affiliation behaviors exhibited by physicians and patients during critical interpersonal interactions may affect health outcomes. The second, and most critical aspect, states that these outcomes may also be influenced by the extent to which there is an optimal match or fit between these behaviors (Kiesler & Auerbach, 2003, 2006).

The Interpersonal Circumplex is organized around the human interaction dimensions of control (dominance-submission) and affiliation (friendliness-hostility) (Kiesler, 1996). The

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model theorizes that human behavior is a blend of these two dimensions. For example, when individuals interact, they continually balance how friendly or hostile (affiliation) they want to be and how much power (control) each individual will retain over their respective behaviors during the interaction (Kiesler & Auerbach, 2003). These two-dimensional control and affiliation interactions identified by Kiesler (1996) are evident in a variety of human behaviors, such as parent-child relationships, perceptions of social situations, mate selection, marriage, and physician-patient interactions.

The theory utilizes a model with 16 categories arranged in a circular fashion to identify the blends between the control and affiliation dimensions. The model displays the possible patterns of control and affiliation between the patient and physician during their interaction. The model can predict which behaviors in the patient will be evoked in reaction to the physician's behavior and vice versa. The interpersonal principle of "complementarity" states that on the affiliation dimension friendly behaviors pull for friendly responses and hostile behaviors pull for hostile responses. On the control dimension dominant behaviors pull for submissive responses and vice versa (Kiesler, 1996; Kiesler & Auerbach, 2006).

Contemporary interpersonal theory emphasizes that patient outcomes can be influenced by the control and affiliation behaviors of participants as well as the extent of match between control and affiliation during a physician-patient interaction. Numerous studies have shown that health care provider low control and high affiliation interpersonal behaviors are associated with positive patient outcomes (Kiesler & Auerbach, 2003). For example, diabetic patients who interacted with nurses who used controlling and directive communication experienced poorer metabolic control (R. L. Street, et al., 1993). Breast cancer patients who had physicians high in affiliative behavior demonstrated better

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psychological adjustment to their illness (C. S. Roberts, et al., 1994). In studies using the IMI, dental surgery patients who viewed their surgeon as either hostile or dominant were rated as less well adjusted during surgery (Auerbach, Martelli, & Mercuri, 1983); and higher patient ratings of health care provider affiliation and low ratings of provider control in a university health center were associated with better patient satisfaction with care (Campbell, et al., 2007).

A second set of findings bear on the question of the influence of health care provider-patient match in interpersonal behaviors on patient outcomes. This research has been reviewed most recently by Kiesler and Auerbach (2006). Consistent with the complementarity hypothesis, studies using the IMI have found that good physician-patient complementary matches (in both control and affiliation behavior or in affiliation behavior alone) were associated with better metabolic control in diabetic patients (Auerbach, et al., 2002), greater satisfaction with and adjustment to dentures (Auerbach, et al., 2004), and more involvement by patients in oral surgery decision making (but not greater satisfaction or adjustment) (Frantsve, 2002). Wartella, Auerbach, & Ward (2009) found that better nurse-family representative complementarity on a critical care unit was associated with greater satisfaction by the family representative to the extent to which their needs and those of the patient were met on the unit. Currently, little data exists on how these interpersonal processes are influenced by race and gender and how they in turn affect pertinent patient health outcomes. In this study, the interpersonal behaviors of control and affiliation were assessed using the 20-item version of the Impact Message Inventory-Circumplex (IMI-C) (Kiesler & Schmidt, 2006).

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Application of the Working Alliance Model to Health Care

In psychotherapy, the working alliance emphasizes the collaboration of client and therapist in the work of therapy and the notion that the quality of this relationship has a direct bearing on the client outcome. At its core, the working alliance is "an intensely human, personal, and essentially unique encounter" (Bachelor & Horvath, 1999). In fact, research suggests that the alliance itself has intrinsic qualities that contribute to its success, and most agree that empathic resonance and mutual affirming are required ingredients for success(Gaston, Marmar, Thompson, & Gallagher, 1991; Kolden, Howard, & Maling, 1994). Thus, the quality of the working alliance in the therapist-client relationship can affect measurable change in clients.

Although there are numerous definitions of the working alliance, the concept of collaboration, mutuality, and engagement are the three unifying elements in all representations of the construct, and were conceptualized by Bordin in his definition of the working alliance (Bordin, 1979; Horvath & Symonds, 1991). He defined the working alliance as a collaborative effort based on the establishment of mutually agreed upon goals, a shared commitment to carrying out the tasks that are required for goal achievement, and the development of a strong emotional bond. The three interdependent components of bonds, goals, and tasks are the requisite building blocks of the working alliance.

Tasks are referred to as the behaviors and cognitions that occur during the therapy session that form the counseling process. Goals are referred to as the outcomes that are the target of the therapeutic intervention. Thus, a strong working alliance is formed when both the client and the therapist agree upon and value the goals. Bonds are referred to as the complex network of positive personal attachments between the client and therapist

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characterized by mutual trust, acceptance, and confidence. The quality of mutuality between the client and therapist in the working alliance is the primary reason for its effectiveness (Bordin, 1979; Horvath & Greenberg, 1989).

Scovern (1999) noted that the healing aspects of the physician-patient relationship are similar to the working alliance in psychotherapy. Although the physician-patient relationship and the therapist-client relationship may differ in terms of the role of interpersonal variables (e.g. patients may desire a more authoritarian physician than therapist), both types of relationships likely benefit from a strong working alliance. Ideally, physicians create a working alliance relationship with the patient that includes, support, negotiation, mutual agreement, and partnership. As in psychotherapy, the attitudes of empathy, warmth, and genuineness are assumed to promote a healing environment for the patient.

Physician-patient relationship variables are associated with a range of patient secondary outcomes such as satisfaction and compliance, as well as some primary medical outcomes such as blood sugar level in diabetics (Kiesler & Auerbach, 2003; D. L. Roter & Hall, 2006a, 2006b). Analogously, component factors associated with the physician-patient working alliance have been shown to influence pain experience, immune system response, length of hospitalization, treatment compliance, and response to surgery (Lorentzen, Sexton, & Hoglend, 2004; Scovern, 1999). For example, Krupnick and colleagues (1996) compared cognitive-behavioral therapy, interpersonal therapy, imipramine plus clinical management, and drug placebo plus clinical management in a National Institute of Mental Health Depression Collaboration Research study. Independent coders assessed the therapeutic alliance and found that it accounted for 21% of the outcome variance regardless of treatment condition. Krupnick's findings indicated that the therapeutic alliance accounted for more

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variance than any treatment condition and that a strong alliance between the patient and managing physician resulted in better outcomes.

In an extensive review of the context (i.e. placebo) effects on health outcomes, Blasi and colleagues (2001) found that practitioners who attempted to form warm and friendly relationships with their patents were found to be more effective than practitioners who remained impersonal, formal or uncertain during consultations. Although the authors advocated the need for further physician-patient research, they did speculate that there is an independent effect of physician-patient interactions. Thus, the quality of the therapeutic or working alliance between a physician and patient can affect measurable psychological and physiological change in patients.

Several recent studies evaluating the physician-patient working alliance have found significant relationships between the alliance and patient adherence and satisfaction. For example, Fuertes et al. (2007) found that patient ratings of the working alliance were associated with patient satisfaction and adherence. The authors concluded that patient agreement, liking, and trust toward a doctor were associated with patient support of the treatment and viewing the treatment as worthy and important. This finding underscores the importance of trust and liking in the physician-patient relationship as these variables have been associated with higher levels of patient adherence and satisfaction (Hall, et al., 2002; Walker, Arnold, Miller-Day, & Webb, 2002). In addition, Fuertes et al. (2009) found a relationship between measures of physician empathy, working alliance, and multicultural competence and outcome measures such as patient satisfaction and adherence. The authors concluded that the working alliance is a significant predictor of patient satisfaction and adherence.

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The present study sought to extend the research to date that has applied the working alliance to medical care, to see if physician-patient working alliance significantly correlates with physician and/or patient characteristics such as race and gender. Both the physician and the patient's perspective of the working alliance were measured using the Physician-Patient Working Alliance (PPWA; Fuertes, et al., 2007), which is a modification of Tracey and Kokotovic's C-WAI (Tracey & Kokotovic, 1989). In addition, the PPWA has been used in the physician-patient communication literature (Fuertes, et al., 2009; Fuertes, et al., 2007). The three subscales of the PPWA correspond to the goals, tasks, and bonds components of Bordin's (1979) working alliance model. The PPWA provided a more global measure of the fit between the physician and the patient whereas the IMI looked at the interpersonal components of this global fit.

Application of the Shared Decision Making Model to Health Care

The Informed and Shared Decision Making models were developed in reaction to the traditional paternalistic model of physician-patient interaction and the changing system of health care accountability in the United States in the mid 1990s. The paternalistic model is defined as a predominately one-way interaction in which medical information, treatment deliberation, and the final treatment decision flows from the physician to the patient. The model emphasizes physician control and authoritarianism along with a nurturing attitude. The informed model is characterized by the one-way flow of medical information from the physician to the patient. The physician's only role is to provide information and the patient alone is responsible for the deliberation and treatment decision. In contrast to the paternalistic model, both informed and shared decision making models advocate the physician's role as

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one using scientific findings to inform patients and enhance patient choice (Charles, Gafni, & Whelan, 1999). The Shared Decision Making model is detailed below.

Shared decision making is frequently misunderstood in the physician-patient communication literature. For example, two recent reviews of the shared decision making literature (Gregory Makoul & Clayman, 2006; Moumjid, Gafni, Bremond, & Carrere, 2007) suggest that researchers disagree on the definition of shared decision making. Authors frequently refer to the term without specifying or citing a definition, use the term inconsistently within their own definition, and rarely recognize or integrate previous work. Thus, it is important to identify the correct definition of shared decision making.

Identified as the most frequently cited definition of shared decision making in an extensive review of the literature by Makoul & Clayman (2006), Charles, Gafni and Whelan's (1997) model of shared decision making consists of four components. The first component requires that shared decision making involve at least two participants- the physician and the patient. The second component requires the exchange of information and information preferences by the patient and the physician. The third component requires the exchange of treatment preferences by the patient and the physician. The final component requires an agreement by both parties on the treatment to implement.

Charles, Gafni, and Whelan's (1999) model is supported by other findings on shared decision making. In an extensive review of the literature, Kiesler and Auerbach (2006) found that the patient's desire for information and decision making exists on a continuum from passive to highly active. Passive patients, a sizable minority, prefer paternalistic relationships and desire to leave all decisions to their doctor. Collaborative patients share the treatment decision with the doctor. Highly active patients make the final treatment decision themselves.

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The majority of patents fall in the collaborative and highly active categories of information and decision making.

The authors also found that most patients are dissatisfied with the amount of information they receive about their diagnosis and report a desire to know more. Patients generally exert their control in the process during the decision making portion rather than seeking more information from the physician (Kiesler & Auerbach, 2006). These findings support the shared decision making model which reflects that decision making is dynamic and may adjust to different models based upon the situation or individual (Charles, et al., 1999).

Patient participation in treatment decision making has been linked to positive medical outcomes. For instance, in a review of the literature on patient participation in medical care, Guadagnoli and Ward (1998) found that patients' involvement in care can lead to reduced pain and anxiety, earlier recovery, and increased compliance. In a study evaluating adult primary care patients, Brody et al. (1989) found that patients who played a more active role in the medical visit self-reported less discomfort, greater alleviation of symptoms, more improvement in general medical condition, less concern with illness, a greater sense of control, and greater satisfaction with the physician than passive patients. Schulman (1979) found in outpatient hypertension clinics that more active patients had better blood pressure control, greater self-reported adherence to treatment recommendations, and greater self-reported comprehension of treatment programs. Wagner et al. (2001), in a study evaluating the chronic care model of health care system improvement, found that empowering patients to be knowledgeable and active in managing their health was associated with improved patient control of hemoglobin a1c and low-density-lipoprotein (LDL) cholesterol.

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Interventions designed to enhance patient participation in decision making improve quality of life and biological markers of patient disease status. For example, van Dam and colleagues (2003), in a systematic review of interventional studies seeking to promote patient participation in decision making using various methods (e.g. assistant-guided patient preparation for visits to doctors, empowering group education, group consultations, or automated telephone management), found that the patient interventions resulted in improved patient self-care and hemoglobin a1c levels. Michie, Miles, & Weinman (2003) in a review of health communication interventions with chronically ill patients, found that interventions designed to "activate" patients (e.g. patient actively taking some control, asking questions, or spontaneously making statements about their concerns) were more consistently associated with good physical health outcomes and were more effective than interventions designed to elicit patient beliefs. Specifically, the authors found that the interventions designed to empowered patients were associated with improved hemoglobin a1c and perceived health status. In summary, these reviews suggest that enabling patients to engage in shared decision making has significant positive effects on health status.

Increased levels of physician-patient communication have been associated with positive medical outcomes. Several studies of HIV-positive patients found that better physician-patient communication promoted higher rates of medication adherence (Malcolm, et al., 2003; K. J. Roberts, 2002). Johnson and colleagues posit that positive physician-patient communication may instill higher adherence self-efficacy, which results in improved adherence in HIV-positive patients (M. O. Johnson, et al., 2006). Stewart and colleagues (1999), in a review of communication in medical care, found generally positive effects of increased communication on actual patient outcomes such as pain, anxiety, functional status,

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and physiologic measures of blood pressure and blood glucose. In fact, Stewart (1995) found that neither physician dominance nor complete submissiveness was associated with better health outcomes. She concluded that the most important aspect associated with better health outcomes in the physician-patient relationship was the ability of patients and physicians to negotiate agreement on their approach to problem solving.

Provision of information to patients has been linked to positive medical outcomes and supports the information exchange stage of the shared decision making model (Auerbach, 2000). Devine and Cook (1983), in a meta-analysis of 49 studies, found that psychosocial educational interventions can reduce the length of hospitalization by 1.25 days. Similarly, education provided to patients before their operation has been demonstrated to accelerate recovery and reduce patient anxiety (Webber, 1990). Haynes et al. (1976) developed a targeted educational intervention for non-compliant hypertension patients. The experimental group reported decreased blood pressure (85%) and increased compliance to medication (21%) when compared to the control. Reviews focusing on cancer patients have concluded that information provision to patients has largely positive effects including decreasing emotional distress (Siminoff, 1989) and positively affecting a range of behavioral, psychological, and medical status variables (Meyer & Mark, 1995).

Shared decision making occurs in the physician-patient interaction. Information exchange, deliberation, and treatment decision making all occur in the physician-patient interaction. However, little is known about the influence of race and gender upon these shared decision making processes or patient health outcome variables. In addition to assessing the interpersonal components of the physician-patient interaction, this study evaluated the information exchange and shared decision making aspects of the interaction.

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The 6-item version of the Participatory Style of Physicians Scale (PSPS), has three subscales: providing medical information, gathering personal information, and facilitating shared decision making.

Statement of the Problem

Compared to the general population, socially disadvantaged patients have higher rates of chronic illness (Ayanian, Weissman, Schneider, Ginsburg, & Zaslavsky, 2000) and require more complex medical care (Bierman, et al., 2001; Mercer & Watt, 2007). They also endorse higher levels of psychological distress (Bierman, Lawrence, Haffer, & Clancy, 2001) and tend to engage in behavioral risk factors such as poor diet, physical inactivity, and smoking (Blankfield, et al., 2002; Centers for Disease Control and Prevention, 2007; Lantz, et al., 2001). These issues are particularly concerning given that this population tends to adhere less to medical recommendations (Bosworth, et al., 2006; R. C. Kaplan, Bhalodkar, Brown Jr, White, & Brown, 2004; Schneider, Kaplan, Greenfield, Li, & Wilson, 2004), has limited access to health resources, and receives poorer treatment from providers (Derjung M. Tarn, et al., 2006; D. M. Tarn, et al., 2006). In an effort to address this disparity, The Affordable Care Act will expand health care access to an additional 23 million uninsured and 17 million underinsured Americans (Foster, 2010). However, simply expanding access to health care without examining and improving upon factors related to the physician-patient relationship would not fully address the health care needs of this population. This study sought to improve the quality of care received by socially disadvantaged patients by better understanding the role of race and gender on the physician-patient communication process and patient outcomes in a safety net primary care clinic. Although exploratory/secondary

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analyses were proposed, the cell sizes for the gender and race dyads were too small to support multilevel analyses.

The major hypotheses are detailed below according to hypothesized race and gender main effects, concordance main effects, and secondary/exploratory hypotheses.

A. Race and Gender

   a. Race of Patient would be associated with:

      i. Differences in Affiliation as measured by the IMI and shared decision making as measured by the PSPS such that physicians will be more Affiliative and facilitate more shared decision making with White than non-white patients. This hypothesis was based on findings from several studies that African American patients did less to prompt doctors for information and doctors in turn provided less information to these patients (Gordon, Jr., et al., 2006), that African American patients perceived physician communication as being less supportive, less partnering, and less informative (Gordon, Street, Sharf, Kelly, & Souchek, 2006), and that physicians tended to have poorer interpersonal skills (Bartlett, et al., 1984; Hooper, et al., 1982), provide less information (Blendon, Aiken, Freeman, & Corey, 1989), and used a less participatory decision making style (Cooper-Patrick, et al., 1999; S. H. Kaplan, et al., 1995; S. H. Kaplan & Greenfield, 1996) when interacting with minority vs. white patients.

      ii. Differences in health status such that non-white patients would have lower perceived health status (i.e. SF-12v2) and worse biological

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variable measurements than white patients. This hypothesis was based upon findings that minority patients experienced disparities in health status even when access related factors such as insurance status and income were controlled (National Center for Health Statistics, 2008; Smedley, et al., 2003; D. Williams & Mohammed, 2009).

b. Gender of Patient would be associated with:

    i. Differences in physician Affiliation as measured by the IMI, the working alliance as measured by the PPWA, and shared decision making and the provision of information as measured by the PSPS such that physicians would be more Affiliative, have a stronger working alliance, and utilize more shared decision making and provide more information (as perceived by patients) to female vs. male patients. This hypothesis was based upon findings from reviews by Hall et al. (1988) and Roter et al. (2002) that physicians demonstrated significantly higher information giving, empathy, and fewer physician-initiated interruptions when interacting with female vs. male patients, and several other studies that female patients asked more questions, get more information (Elderkin-Thompson & Waitzkin, 1999; Hall & Roter, 1995), received more counseling (Bertakis & Azari, 2007), had more participatory visits (S. H. Kaplan, et al., 1995), and prefered a more active role in medical decision making than male patients (Arora & McHorney, 2000).

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ii. Differences in patient Control and Affiliation as measured by the IMI, such that female patients would utilize less control and more affiliation (as perceived by physicians) than male patients. This hypothesis was based upon findings from Bertakis et al. (2009) that female patient interactions with their physician were characterized by greater patient centered communication than male patients. No studies have evaluated the physician's perceptions of the patient as measured by the IMI as a function of patient gender. However, requests by researchers for more studies to understand how and why health providers appear to be communicating differently to patients based on patient gender, supported the evaluation of this hypothesis (Bertakis, 2009; Sandhu, et al., 2009).

c. Gender of Physician would be associated with:

i. Differences in patient perception of physician involvement in shared decision making and working alliance such that female physician status would be positively associated with higher patient ratings as measured by the PSPS and PPWA. This hypothesis was supported by reviews that suggested a tendency of female physicians to ask more psychosocial and closed-ended questions (D. L. Roter & Hall, 2004; D. L. Roter, et al., 2002).

ii. Differences in interpersonal stance such that female physician status would be positively associated with a more complementary interpersonal stance as measured by the IMI and physician and patient

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perceptions of a better working alliance as measured by the PPWA. This hypothesis was supported by several studies and a review that female physicians tended to utilize higher levels of partnership behaviors than male physicians (Cooper-Patrick, et al., 1999; D. L. Roter & Hall, 2004).

iii. Differences in patient interpersonal stance such that patients of female physicians would react using a more assertive interpersonal stance (e.g. high dominance and high friendliness) as measured by the IMI as this relationship was identified by Roter, Hall, & Aoki (2002) in a meta-analytic review of physician gender effects in medical communication.

iv. Differences in the length of the patient visit such that the medical visit (measured via audio recordings) would be longer for female physicians as compared to male physicians since this relationship was identified in a review (D. L. Roter, et al., 2002).

B. Concordance Effects

a. Race concordance would be associated with:

i. Differences in communication such that concordance would be positively associated with measures of interpersonal, shared decision making, and the working alliance such that,

1. Low levels of physician and patient control and high levels of physician and patient affiliation on the IMI would be associated with race concordance.

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2. High levels of providing medical information, gathering personal information, and facilitating shared decision making on the PSPS would be associated with race concordance.
3. High levels of the working alliance on the PPWA would be associated with race concordance.

These hypotheses were based on an extensive review by Meghani et al. (2009) who suggested that trends in the literature support a positive relationship between race concordance and improved physician-patient communication.

ii. Differences in patient satisfaction such that concordance would be associated with increased patient satisfaction as measured by the MPSQ as an extensive review supports this relationship (Meghani, et al., 2009).

b. Gender concordance/discordance would be associated with:

i. Differences in physician and patient perception of the interpersonal, shared decision making, and working alliance such that concordance would be associated with better interpersonal (e.g. higher levels of mutual Affiliation), better shared decision making, and a better working alliance. This hypothesis was supported by several studies that suggested gender concordance has been associated with better facilitation of communication and mutual understanding (P. Franks & Bertakis, 2003), greater patient trust (Bonds, et al., 2004; P. Franks & Bertakis, 2003), better physician ability to "understand the whole

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person" (Bertakis, et al., 2009), better physician-patient rapport (Gross, et al., 2008), and more positive physician interactions with patients (DiMatteo, et al., 2009).

ii. Differences in the length of the patient visit such that the medical visit (measured via audio recordings) would be longer for gender concordant vs. discordant visits as Franks and Bertakis (2003) found this relationship to be significant.

iii. Differences in patient biological variables such that patients of female physicians would demonstrate improved hemoglobin A1C control, LDL cholesterol, and systolic blood pressure as Schmittdiel et al. (2009) found an association between female gender concordance and patient biological variables.

iv. Differences in physician and patient perception of the interpersonal, shared decision making, and working alliance such that discordance would be associated with worse interpersonal (e.g. higher levels of mutual Control), worse shared decision making, and a worse working alliance. This hypothesis was supported by several studies that suggested gender discordance, but not concordance had been associated with patient perceived problems of being treated with respect by clinicians (Beran, et al., 2007), more concerning physician perceptions, reduced patient respect, and lower communication quality (Beran, et al., 2007; Gross, et al., 2008).

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Method

Overview

Self-report data were obtained from adult (aged 18 and above) patients and physicians before and after scheduled patient appointments at the Primary Care Clinic. Patient biological measures recorded in the medical record by the clinic staff (e.g. health literacy score, pain score, blood pressure, weight, height, A1C level, cholesterol & triglyceride levels, vaccination status) were collected as well. Follow-up data on patients were collected approximately 4 weeks after the enrollment visit to determine if the patient-provider communication style was associated with patient satisfaction, adherence, and/or health status.

Participants

Resident physicians. A total of 47 resident physicians from the Internal Medicine Residency Training Program at Virginia Commonwealth University were approached about the study. Of those approached, 6% (n = 3) declined to participate and cited reasons such as a "shy personality" and the belief that the provider's patients would not be interested in the study. Thus, 94% (n = 44) of the physicians approached about the study agreed to participate. Of these 44 physicians, physician-patient interaction data were not obtained on three of them due to their limited clinic availability.

Detailed in Table 1, the final sample consisted of 41 resident physicians with a mean age of 29.15 years (*SD* = 2.20; range: 25 to 37 years). More than half were female and 71% were White. The sample was representative of the total eligible Internal Medicine resident physicians for the study period (June 2010 - December 2010) in which 61% of residents were female and 67% were White (Virginia Commonwealth University Medical Center, 2009, 2010). Non-White providers in the sample included Asian (n = 8; 20%), African American (n

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= 3; 8%) and Native Hawaiian (*n* = 1; 2%) physicians. Almost all of the providers identified as non-Hispanic (*n* = 40; 98%). Marital status was evenly split between married/partner (*n* = 20; 49%) and single/never married (*n* = 20; 49%); one physician identified as divorced/separated (*n* = 1; 2%). Seventy-eight percent (*n* = 32) of providers said they were born in the United States and 88% (*n* = 36) reported living in the United States for more than 10 years.

The training characteristics of the physicians in the study were primarily homogenous because the majority of them were MDs who were focused on a subspecialist career path. More than 90% (n = 37) of physicians identified as a Doctor of Medicine (M.D.), where as 10% (n = 4) identified as a Doctor of Osteopathic Medicine (D.O.). The largest share of physicians who participated in the study were in their third year of training (PGY3; *n* = 25, 61%) while PGY2 and PGY4 composed 34% (*n* = 14) and 5% (*n* = 2) respectively. More than 90% (*n* = 37) identified as belonging to the categorical track, which was the traditional track for those pursuing careers in general adult internal medicine or any of its subspecialties. The remaining 10% were evenly divided between Medicine-Pediatrics (*n* = 2; 5%) and Physician-Scientist (*n* = 2; 5%) tracks. Of the 37 categorical track physicians, 65% (*n* = 24) identified as belonging to the subspecialists pathway, which was defined as a specialty track for those pursuing subspecialty careers such as medical oncology, infectious disease, etc. Approximately 22% (*n* = 8) of the categorical physicians identified as belonging to the hospitalists pathway, while the remaining physicians were divided among generalist pathway (*n* = 2; 5%), women's health pathway (*n* = 2; 5%), and undecided (*n* = 1; 3%).

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Table 1

Sociodemographic Characteristics of Resident Physicians

Variable	Native Hawaiian (*n* = 1)		African American (*n* = 3)		Asian (*n* = 8)		White (*n* = 29)		Total (*n* = 41)	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Physician Characteristics										
Age M(*SD*)	29	.	32	(5)	28	(2)	29	(2)	29	(2)
Gender										
Male	0	0.0	0	0.0	5	12.2	11	26.8	16	39.0
Female	1	2.4	3	7.3	3	7.3	18	43.9	25	61.0
Ethnicity										
Hispanic or Latino	0	0.0	0	0.0	0	0.0	1	2.4	1	2.4
Not Hispanic or Latino	1	2.4	3	7.3	8	19.5	28	68.3	40	97.6
Marital Status										
Married/Partnered	1	2.4	0	0.0	3	7.3	16	39.0	20	48.8
Divorced/Separated	0	0.0	0	0.0	0	0.0	1	2.4	1	2.4
Single, never married	0	0.0	3	7.3	5	12.2	12	29.3	20	48.8
Nativity										
Born in the U.S.	1	2.4	2	4.9	2	4.9	27	65.9	32	78.0
Born outside the U.S.	0	0.0	1	2.4	6	14.6	2	4.9	9	22.0
Years lived in the U.S.										
0-3 Years	0	0.0	0	0.0	1	2.4	1	2.4	2	4.9
4-6 Years	0	0.0	0	0.0	2	4.9	0	0.0	2	4.9
7-10 Years	0	0.0	0	0.0	1	2.4	0	0.0	1	2.4
More than 10 Years	1	2.4	3	7.3	4	9.8	28	68.3	36	87.8
Degree										
M.D.	1	2.4	3	7.3	8	19.5	25	61.0	37	90.2
D.O.	0	0.0	0	0.0	0	0.0	4	9.8	4	9.8
Year										
PGY2	0	0.0	1	2.4	2	4.9	11	26.8	14	34.1
PGY3	1	2.4	1	2.4	6	14.6	17	41.5	25	61.0
PGY4	0	0.0	1	2.4	0	0.0	1	2.4	2	4.9
Track										
Categorical	1	2.4	2	4.9	8	19.5	26	63.4	37	90.2
Medicine Pediatrics	0	0.0	1	2.4	0	0.0	1	2.4	2	4.9
Physician-Scientist	0	0.0	0	0.0	0	0.0	2	4.9	2	4.9
Pathway										
Generalist	0	0.0	0	0.0	1	2.4	1	2.4	2	4.9
Hospitalist	0	0.0	1	2.4	1	2.4	6	14.6	8	19.5
Subspecialist	1	2.4	1	2.4	5	12.2	18	43.9	18	43.9
Women's Health	0	0.0	0	0.0	0	0.0	2	4.9	2	4.9
Other/N/A	0	0.0	1	2.4	0	0.0	2	4.9	3	7.3
Annual Household Income										
$35,000 to $49,999	0	0.0	3	7.3	4	9.8	15	36.6	22	53.7
$50,000 to $74,999	0	0.0	0	0.0	2	4.9	4	9.8	6	14.6
$75,000 to $99,999	0	0.0	0	0.0	1	2.4	6	14.6	7	17.1
$100,000 and over	1	2.4	0	0.0	0	0.0	4	9.8	5	12.2
Prefer not to answer	0	0.0	0	0.0	1	2.4	0	0.0	1	2.4
Political Orientation										
Conservative	0	0.0	0	0.0	0	0.0	7	17.1	7	17.1
Moderate	0	0.0	1	2.4	3	7.3	13	31.7	17	41.5
Liberal	0	0.0	1	2.4	2	4.9	9	22.0	12	29.3
Prefer not to answer	1	2.4	1	2.4	3	7.3	0	0.0	5	12.2

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Table 1 (Continued)

Sociodemographic Characteristics of Resident Physicians

Variable	Native Hawaiian (*n* = 1)		African American (*n* = 3)		Asian (*n* = 8)		White (*n* = 29)		Total (*n* = 41)	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Physician Characteristics										
Parent Education Level										
8th grade or less	0	0.0	0	0.0	1	2.4	0	0.0	1	2.4
Completed High School or GED equivalent	0	0.0	0	0.0	0	0.0	1	2.4	1	2.4
Completed two years of college or Associate Degree	0	0.0	0	0.0	0	0.0	3	7.3	3	7.3
Completed Bachelor Degree	0	0.0	1	2.4	3	7.3	5	12.2	9	22.0
Started Graduate or Professional School	0	0.0	0	0.0	0	0.0	1	2.4	1	2.4
Completed Graduate or Professional School	1	2.4	2	4.9	3	7.3	19	46.3	25	61.0
Prefer not to answer	0	0.0	0	0.0	1	2.4	0	0.0	1	2.4
Parent Annual Household Income while Resident was in Medical School										
Less than $15,000	0	0.0	1	2.4	1	2.4	0	0.0	2	4.9
$15,000 to $24,999	0	0.0	0	0.0	0	0.0	2	4.9	2	4.9
$25,000 to $34,999	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
$35,000 to $49,999	0	0.0	0	0.0	0	0.0	1	2.4	1	2.4
$50,000 to $74,999	0	0.0	2	4.9	1	2.4	4	9.8	7	17.1
$75,000 to $99,999	0	0.0	0	0.0	2	4.9	5	12.2	7	17.1
$100,000 and over	1	2.4	0	0.0	3	7.3	16	39.0	20	48.8
Prefer not to answer	0	0.0	0	0.0	1	2.4	1	2.4	2	4.9

Note.

From a socioeconomic standpoint, physicians in the study came from highly educated and financially secure families. More than half (*n* = 22; 54%) reported an annual household income of between $35,000 and $49,999, while 44% (*n* = 18) reported an income of more than $50,000. Almost two-thirds (*n* = 25; 61%) of the physicians reported that their parents had completed graduate or professional school education and almost half (n = 20; 48%) of the physicians reported their parents' annual household income at $100,000 and over while the resident was in medical school. Physicians self-reported their U.S. political orientation and more than two-thirds (n = 17; 42%) identified as moderate, while 29% (*n* = 12), 17% (*n*

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= 7), and 12% (*n* = 5) identified as liberal, conservative, and prefer not to answer, respectively. In summary, the composite typical physician in this study was a 29 year-old, White, female, in her third year of training in the categorical track (subspecialist pathway), making less than $50,000 per year, with highly educated (completed graduate or professional school) and financially secure parents ($100,000 and over per year annual household income), and who self-reported identifying the most with a moderate U.S. political orientation.

Patients. A total of 1,819 patient visits were screened for inclusion in the study between May 26, 2010 and December 17, 2010. Excluding return visits (i.e. duplicate patients), more than half (*n* = 1,332; 52%) of the total arrived patients (n = 2,582; Pitts Jr., 2011) for the study period were screened for inclusion. Of the 1,332 patients, 299 (22.4%) were excluded because they had not seen their physician at least once prior to the study visit and 220 (16.5%) were excluded because they had neither a diagnosis of hypertension or diabetes. In addition, 22 of the eligible screened patients were excluded because their physician was not in the clinic on the day of enrollment due to various reasons such as scheduling changes or personal illness. Thus, 790 patients were eligible to participate based on a review of each patient's medical record.

Of the 790 eligible screened patients, 79 (10%) did not arrive for their appointment. Of the 711 remaining patients who arrived for their appointment, 574 (80.7%) patients were approached about enrollment in the study; 137 (19.3%) patients were missed due to limited research assistant support. Furthermore, of the 574 patients approached about enrollment, 57 (9.9%) displayed limited cognitive capacity during the consent process as evaluated by Daniel Baughn and were subsequently excluded from enrollment. Of the 517 patients who

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met all inclusion criteria and were approached about the study, 186 (36%) declined to participate and 331 (64%) patients enrolled. One patient (#136) who did not meet the hypertension or diabetes diagnosis requirement was unintentionally enrolled and was subsequently removed from the study and all analyses. In addition, 5 patients who declined to participate when first approached about the study later agreed to participate when approached a second time on another date.

Descriptive data were captured on the patients who declined to participate in the study. Detailed in Table 2, decliners consisted of 186 patients with a mean age of 61.88 years (*SD* = 12.671; range: 25 - 89 years). More than half (*n* = 119; 64%) were female and 73% (n = 135) were African American; 27% (*n* = 50) were White. The majority (*n* = 183; 98%) of those who declined to participate were not Hispanic or Latino. The refusal reasons provided by those who declined to participate were aggregated and coded into the following categories, which accounted for 92.5% of the responses: Not interested/No other response provided (*n* = 98; 52.7%), No time (*n* = 46; 24.7%), Illness/Pain (*n* = 18; 9.7%), and Concerns about the relationship with the doctor (*n* = 10; 5.4%).

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Table 2

Sociodemographic Characteristics of Patients who Declined to Participate

Variable	American Indian (*n* = 1)		White (*n* = 50)		African American (*n* = 135)		Total (*n* = 186)	
	n	%	*n*	%	*n*	%	*n*	%
Patient Characteristics								
Age M(*SD)*	70	.	55	(10)	64	(13)	62	(13)
Gender								
Male	1	0.5	18	9.7	48	25.8	67	36.0
Female	0	0.0	32	17.2	87	46.8	119	64.0
Observed Ethnicity								
Hispanic or Latino	0	0.0	3	1.6	0	0.0	3	1.6
Not Hispanic or Latino	1	0.5	47	25.3	135	72.6	183	98.4
Hypertension								
Yes	1	0.5	49	26.3	134	72.0	184	98.9
No	0	0.0	1	0.5	1	0.5	2	1.1
Diabetes								
Yes	1	0.5	13	7.0	56	30.1	70	37.6
No	0	0.0	37	19.9	79	42.5	116	62.4
Both HTN & DM								
Yes	1	0.5	12	6.5	55	29.6	68	36.6
No	0	0.0	38	20.4	80	43.0	118	63.4
Coded Refusal Reasons								
Not interested	0	0.0	25	13.4	73	39.2	98	52.7
No time	0	0.0	11	5.9	35	18.8	46	24.7
Illness/pain	1	0.5	2	1.1	15	8.1	18	9.7
Concerns about relationship w/ MD	0	0.0	5	2.7	5	2.7	10	5.4
Need to have a confidential conversation with my doctor	0	0.0	2	1.1	1	0.5	3	1.6
I have a good relationship with my MD	0	0.0	3	1.6	0	0.0	3	1.6
No reason provided	0	0.0	0	0.0	2	1.1	2	1.1
Not comfortable with audio recording	0	0.0	0	0.0	2	1.1	2	1.1
I'll be embarrassed/feel uncomfortable	0	0.0	2	1.1	0	0.0	2	1.1
Unable to redeem the gift card	0	0.0	0	0.0	1	0.5	1	0.5
Unable to read	0	0.0	0	0.0	1	0.5	1	0.5
Physician Characteristics								
Race								
White	1	0.5	32	17.2	85	45.7	118	63.4
Asian	0	0.0	11	5.9	35	18.8	46	24.7
African American	0	0.0	3	1.6	10	5.4	13	7.0
Native Hawaiian	0	0.0	4	2.2	5	2.7	9	4.8
Gender								
Male	1	0.5	19	10.2	56	30.1	76	40.9
Female	0	0.0	31	16.7	79	42.5	110	59.1

Note.

The final sample consisted of 330 patients with a mean age of 59.12 years (*SD* = 10.89; range: 24 to 87 years). Detailed in Table 3, approximately 30% of the sample

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reported being age 65 or older (*n* = 100; 30.3%). More than half of the patients were female (*n* = 218; 66.1%) and 67.6% (*n* = 223) were African American; 30% (*n* = 99) were White, 1.5% (*n* = 5) were American Indian/Alaska Native, .6% (*n* = 2) were more than one race, and .3% (*n* = 1) were Native Hawaiian or other Pacific Islander. Almost every patient identified as Not-Hispanic or Latino (*n* = 329; 99.7%). The sample was representative of total clinic patient demographics during the study period in which 67% (*n* = 1,742) of patients were between age 18 and 64, 33% (n = 840) of patients were age 65 and older, 62.54% (*n* = 1,615) of patients were female, and 66.6% (*n* = 1720) of patients were African American; 32.2% (*n* = 832) were White, 0.7% (*n* = 19) were Other, and 0.3% (*n* = 8) were American Indian/Alaska Native (Pitts Jr., 2011). All of the patients in the study were diagnosed with a chronic disease such that 98.2% (*n* = 324) had hypertension, 43.3% (*n* = 143) had type II diabetes mellitus, 0.6% (*n* = 2) had type I diabetes mellitus, and 42% (*n* = 139) had both hypertension and diabetes mellitus.

The demographic and socioeconomic characteristics of the patients varied considerably. Marital status was split between divorced/separated (*n* = 104; 31.5%), single/never married (*n* = 104; 31.5%), married/partner (*n* = 64; 19.4%), and widowed (*n* = 57; 17.3%). Almost all patients (n = 326; 98.8%) reported being born in the United States and every patient reported living here for more than 10 years (*n* = 330). Education ranged from 8th grade or less (n = 47; 14.2%) to completed graduate or professional school (n = 3, 0.9%) and the majority of patients either started high school (*n* = 99; 30%) or completed high school/GED (*n* = 106; 32.1%). More than two-thirds of patients reported being disabled (*n* = 148; 44.8%), while the remaining patients reported being either retired (*n* = 83; 25.2%), unemployed (*n* = 50; 15.2%), part-time (*n* = 25; 7.6%), full-time (*n* = 15; 4.5%), or

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homemaker (n = 9; 2.7%). Almost three-quarters of the patients reported an annual household income of less than $15,000 (n = 245; 74.2%) while 20.3% (n = 67) reported $15,000 to $24,999, 3.6% ($n$ = 12) reported $25,000 to $34,999, and 1.2% ($n$ = 4) reported $35,000 to $74,999 per year. Patients were almost equally divided between living 0 to 15 miles from the clinic (n = 152; 46.1%) and 45+ miles from the clinic (n = 123; 37.3%). The remaining patients reported living 16 to 30 miles (n = 30; 9.1%), and 31 to 45 miles (n = 25; 7.6%) from the clinic. Patients self-reported their current U.S. political orientation as liberal (n = 126; 38.2%), prefer not to answer (n = 92; 27.9%), conservative (n = 57; 17.3%), moderate (n = 51; 15.5%), and independent (n = 4; 1.2%).

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Table 3

Sociodemographic Characteristics of Patients

Variable	Native Hawaiian/Other Pacific Islander (*n* = 1)		More than one race (*n* = 2)		American Indian/Alaska Native (*n* =5)		White (*n* = 99)		African American (*n* = 223)		Total (*n* = 330)	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Patient Characteristics												
Mean Age *(SD)*	51	.	62	(15)	61	(9)	56	(9)	60	(11)	59	(11)
Mean visits with this MD *(SD)*	3	.	4	(1)	4	(2)	4	(2)	4	(2)	4	(2)
Mean visits to this clinic *(SD)*	3	.	4	(1)	6	(3)	8	(4)	7	(3)	7	(3)
Gender												
Male	1	0.3	1	0.3	1	0.3	43	13.0	66	20.0	112	33.9
Female	0	0.0	1	0.3	4	1.2	56	17.0	157	47.6	218	66.1
Ethnicity												
Hispanic or Latino	0	0.0	0	0.0	0	0.0	1	0.3	0	0.0	1	0.3
Not Hispanic or Latino	1	0.3	2	0.6	5	1.5	98	29.7	223	67.6	329	99.7
Marital Status												
Married/Partnered	0	0.0	1	0.3	1	0.3	28	8.5	34	10.3	64	19.4
Divorced/Separated	0	0.0	0	0.0	3	0.9	37	11.2	64	19.4	104	31.5
Widowed	1	0.3	0	0.0	0	0.0	13	3.9	43	13.0	57	17.3
Single, never married	0	0.0	1	0.3	1	0.3	21	6.4	81	24.5	104	31.5
Other	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3	1	0.3
Nativity												
Born in the U.S.	1	0.3	2	0.6	5	1.5	96	29.1	222	67.3	326	98.8
Born outside the U.S.	0	0.0	0	0.0	0	0.0	3	0.9	1	0.3	4	1.2
Years in the U.S.												
More than 10 years	1	0.3	2	0.6	5	1.5	99	30.0	223	67.6	330	100.0

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Table 3 Continued

Sociodemographic Characteristics of Patients

Variable	Native Hawaiian/Other Pacific Islander (*n* = 1)		More than one race (*n* = 2)		American Indian/Alaska Native (*n* =5)		White (*n* = 99)		African American (*n* = 223)		Total (*n* = 330)	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Patient Characteristics												
Education												
8th grade or less	0	0.0	1	0.3	0	0.0	10	3.0	36	10.9	47	14.2
Started high school	1	0.3	0	0.0	1	0.3	23	7.0	74	22.4	99	30.0
Completed high school or GED equivalent	0	0.0	1	0.3	1	0.3	38	11.5	66	20.0	106	32.1
Completed one year of college	0	0.0	0	0.0	1	0.3	7	2.1	18	5.5	26	7.9
Completed two years of college or Associate Degree	0	0.0	0	0.0	1	0.3	12	3.6	15	4.5	28	8.5
Completed three years of college	0	0.0	0	0.0	0	0.0	2	0.3	4	1.2	6	1.8
Completed Bachelor Degree	0	0.0	0	0.0	0	0.0	4	1.2	6	1.8	10	3.0
Started Graduate or professional school	0	0.0	0	0.0	1	0.3	1	0.3	3	0.9	5	1.5
Completed Graduate or professional school	0	0.0	0	0.0	0	0.0	2	0.6	1	0.3	3	0.9
Health Literacy (REALM-R)												
At risk for poor health literacy (≤ 6)	0	0.0	0	0.0	0	0.0	19	5.8	77	23.3	96	29.1
Not at risk (≥ 7)	0	0.0	0	0.0	3	0.9	49	14.8	70	21.2	122	37.0
Unknown	1	0.3	2	0.6	2	0.6	31	9.4	76	23.0	112	33.9
Employment												
Full-time	0	0.0	0	0.0	0	0.0	5	1.5	10	3.0	15	4.5
Part-time	0	0.0	0	0.0	0	0.0	10	3.0	15	4.5	25	7.6
Homemaker	0	0.0	0	0.0	0	0.0	4	1.2	5	1.5	9	2.7
Retired	0	0.0	1	0.3	3	0.9	11	3.3	68	20.6	83	25.2
Unemployed	0	0.0	1	0.3	1	0.3	22	6.7	26	7.9	50	15.2
Disabled	1	0.3	0	0.0	1	0.3	47	14.2	99	30.0	148	44.8

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Table 3 Continued

Sociodemographic Characteristics of Patients

Variable	Native Hawaiian/Other Pacific Islander (*n* = 1)		More than one race (*n* = 2)		American Indian/Alaska Native (*n* =5)		White (*n* = 99)		African American (*n* = 223)		Total (*n* = 330)	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Patient Characteristics												
Annual Household Income												
Less than $15,000	1	0.3	1	0.3	4	1.2	70	21.3	169	51.5	245	74.7
$15,000 to $24,999	0	0.0	1	0.3	1	0.3	23	7.0	42	12.8	67	20.4
$25,000 to 34,999	0	0.0	0	0.0	0	0.0	6	1.8	6	1.8	12	3.7
$35,000 to $49,999	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3	1	0.3
$50,000 to $74,999	0	0.0	0	0.0	0	0.0	0	0.0	3	0.9	3	0.9
Miles traveled to clinic												
0-15 miles	0	0.0	0	0.0	0	0.0	18	55	134	40.6	152	46.1
16-30 miles	0	0.0	0	0.0	2	0.6	13	3.9	15	4.5	30	9.1
31-45 miles	1	0.3	0	0.0	1	0.3	12	3.6	11	3.3	25	7.6
45+ miles	0	0.0	2	0.6	2	0.6	56	17.0	63	19.1	123	37.3
Political Orientation												
Conservative	0	0.0	0	0.0	0	0.0	36	10.9	21	6.4	57	17.3
Moderate	0	0.0	0	0.0	1	0.3	21	6.4	29	8.8	51	15.5
Liberal	1	0.3	0	0.0	3	0.9	9	2.7	113	34.2	126	38.2
Independent	0	0.0	0	0.0	0	0.0	2	0.6	2	0.6	4	1.2
Prefer not to answer	0	0.0	2	0.6	1	0.3	31	9.4	58	17.6	92	27.9
Patient Health Characteristics at Enrollment												
Hypertension per Medical Record												
Yes	1	0.3	2	0.6	5	1.5	98	29.7	218	66.1	324	98.2
No	0	0.0	0	0.0	0	0.0	1	0.3	5	1.5	6	1.8
Diabetes per Medical Record												
Yes	0	0.0	1	0.3	1	0.3	39	11.8	104	31.5	145	43.9
No	1	0.3	1	0.3	4	1.2	60	18.2	119	36.1	185	56.1
Both HTN & DM per Medical Record												
Yes	0	0.0	1	0.3	1	0.3	38	11.5	99	30.0	139	42.1
No	1	0.3	1	0.3	4	1.2	61	18.5	124	37.6	191	57.9

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Table 3 Continued

Sociodemographic Characteristics of Patients

Variable	Native Hawaiian/Other Pacific Islander (*n* = 1)		More than one race (*n* = 2)		American Indian/Alaska Native (*n* =5)		White (*n* = 99)		African American (*n* = 223)		Total (*n* = 330)	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Patient Health Characteristics at Enrollment												
Body Mass Index												
Underweight (Below 18.5)	0	0.0	0	0.0	0	0.0	1	0.3	3	0.9	4	1.2
Normal (18.5-24.9)	0	0.0	0	0.0	0	0.0	17	5.2	19	5.8	36	10.9
Overweight (25.0-29.9)	0	0.0	0	0.0	2	0.6	22	6.7	54	16.4	78	23.6
Obese Class I (30.0-34.9)	1	0.3	0	0.0	1	0.3	22	6.7	51	15.5	75	22.7
Obese Class II (35.0-39.9)	0	0.0	2	0.6	0	0.0	15	4.5	53	16.1	70	21.2
Obese Class III (40.0 and Above)	0	0.0	0	0.0	2	0.6	22	6.7	43	13.0	67	20.3
Blood Pressure												
Normal	1	0.3	0	0.0	2	0.6	18	5.5	38	11.5	59	17.9
Prehypertension	0	0.0	0	0.0	1	0.3	44	13.3	85	25.8	130	39.4
Stage I Hypertension	0	0.0	1	0.3	2	0.6	29	8.8	73	22.1	105	31.8
Stage II Hypertension	0	0.0	1	0.3	0	0.0	8	2.4	27	8.2	36	10.9
Pain (1-10, visual analogue scale)												
Mean Pain *(SD)*	0	.	5	(7)	8	(2)	5	(4)	4	(4)	4	(4)
Health Status (SF-12v2)												
Mean Physical Health *(SD)*	31.30	.	31.38	(1.15)	27.80	(5.87)	26.10	(10.52)	31.58	(10.05)	29.89	(10.38)
Mean Mental Health *(SD)*	27.11	.	39.52	(11.91)	42.26	(16.83)	45.16	(13.47)	45.93	(13.16)	45.55	(13.28)
Physician Characteristics												
Race												
White	1	0.3	2	0.6	3	0.9	64	19.4	140	42.4	210	63.6
Asian	0	0.0	0	0.0	1	0.3	25	7.6	58	17.6	84	25.5
African American	0	0.0	0	0.0	1	0.3	7	2.1	14	4.2	22	6.7
Native Hawaiian	0	0.0	0	0.0	0	0.0	3	0.9	11	3.3	14	4.2
Gender												
Male	0	0.0	2	0.6	0	0.0	37	11.2	96	29.1	135	40.9
Female	1	0.3	0	0.0	5	1.5	62	18.8	127	38.5	195	59.1

Note.

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Measures

SF-12v2 Health Survey. The SF-12v1 (SF-12;Ware, Kosinski, & Keller, 1996) was derived from the widely used SF-36 survey of health and includes general physical and mental health and whether physical or emotional symptoms interfere with social or occupational role functioning. It comprises 12 items and is scored by weighted algorithms that yield two scales: the Physical Component Summary (PCS) and the Mental Component Summary (MCS), which together capture 85% of the variance in the SF-36. It is a reliable measure of health status in population surveys, and the standardized mean score of average health status is 50. The SF-12v2 was subsequently developed in a similar manner to the SF-12v1 (Ware, et al., 1996) with changes to the item wording and range of responses. The increased range of responses in the SF-12v2 items minimizes the ceiling and flooring effects, thus allowing for the scoring of the 8 scales (e.g. physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, mental health) in addition to the 2 summary scores (e.g. physical health component scale and mental health component scale) (Ware & Kosinski, 2001; Ware, et al., 2002). The SF-12v2 has been shown to reliably reproduce the same 8 scale scores (reliability coefficient range, .73–.87) and the 2 summary scores (reliability coefficients for PCS .89; MCS .86) in the general population (Ware & Kosinski, 2001; Ware, et al., 2002). All SF-12v2 results for this study were calculated using norms based on scoring (i.e., 1998 US Sample). Each scale was scored to have the same average (50) and the same standard deviation (10 points). Thus, anytime a scale score is below 50, health status is below average and each point is one-tenth of a standard deviation (Ware, et al., 2002). The patient completed the SF-12v2 as part of the Patient Enrollment and Patient Follow-Up Forms.

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Impact Message Inventory – 20 (Doctor & Patient versions). The IMI (Kiesler & Schmidt, 2006) characterizes a target individual's interpersonal behavior through assessment of the respondent's covert reactions, or impact messages, evoked during encounters with that target individual. Such covert reactions include feelings, action tendencies, and cognitive attributions. Examples of items are: When I was with this person, he/she made me feel… "bossed around," "appreciated by him/her," "that I could tell him/her anything and he/she would agree," "that he/she wants me to put him/her on a pedestal." Respondents indicate how accurately each item describes their reaction to the target using a 4-point scale, which ranges from 1 (not at all) to 4 (very much so) (Schmidt, Wagner, & Kiesler, 1999). The 20-item short form of the IMI octant version, created for use in medical settings, was used for this study. This short version IMI was filled out by both the patient and physician at the end of their consultation interactions. The short form IMI produces four raw scores: dominant, hostile, submissive, and friendly; and two axis scores: control and affiliation. When pairs of IMI protocols are available for an interacting dyad, one can also obtain three interpersonal "complementarity" indexes: for the control and affiliation dimensions separately as well as for their interactive combination. Internal consistency coefficients for the IMI scales range from .69 to .89. The resident physician completed the IMI as part of the Resident Post-Visit Form and patient completed the IMI as part of the Patient Post-Visit Form.

Participatory Style of Physician Scale – 5 (Doctor & Patient versions). The PSPS (Kiesler & Auerbach, 2003) was designed to measure physician's participatory style during consultations with patients. There are two versions of this scale that are completed by the patients; one measures the extent to which patients desire their physician to engage in a participatory style during the impending consultation and the other asks the patients to

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evaluate the physician's actual participatory style during the just completed consultation. Another version is available for the physician to complete and it asks doctors to evaluate their actual participatory behavior during the completed consultation. The fourth version was designed for independent coders to complete as they listen to the audiotaped consultations and assess what the physician actually did during the consultation. The 15 items of the PSPS-15 are almost identical in content and only vary in the wording of instructions and pronouns. Further, all four versions of this instrument were constructed to measure three subscales which represent the essential components emphasized in the shared decision making model of Charles, Gafni, and Whelan (1997), as well as the important elements found in models of informed consent in the bioethics literature. These three subscales are: Providing Medical Information (e.g., "discussed the benefits or risks of each of the treatment alternatives"), Gathering Personal Information (e.g., "encouraged me to talk about personal concerns related to my treatment decision"), and Facilitating Shared Decision Making (e.g., "provided me an equal role in the treatment decision process"). The PSPS-15 was reduced to 5 items for this study because prior factor analytic work (Campbell, 2006) suggested items could be removed that (1) did not display manifest content relevant to the primary care setting and (2) because several items had low loadings or indiscriminant loadings on several factors. The internal consistency reliability alpha coefficient for the items in the present study was 0.88. The resident physician completed the PSPS as part of the Resident Post-Visit Form and the patient completed the PSPS as part of the Patient Post-Visit Form.

Physician-Patient Working Alliance – 12 (Doctor & Patient versions). The PPWA (Fuertes, et al., 2007) was a modification of Tracey and Kokotovic's C-WAI (Tracey & Kokotovic, 1989), which has an excellent overall internal consistency reliability alpha

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coefficient of 0.98 and there is strong evidence for concurrent and predictive validity. Fuertes, et al. (2007) reworded all 12 items on the C-WAI to pertain to the medical relationship and altered the scaling. Subjects are asked to rate their responses on a scale of 1 (strongly disagree) to 5 (strongly agree). A sample item from the agreement on goals subscale is ‘‘My doctor and I agree on my treatment plan.’’ A sample item from the agreement on tasks subscale is ‘‘My doctor and I agree about the things I need to do to help improve my health.’’ A sample item from the bond subscale is ‘‘My doctor understands all of what I am going through with my medical problem.’’ Fuertes et al. (2007) reported the internal consistency alpha coefficient of the PPWA-12 was 0.93, and 0.82, 0.72, and 0.89 for the tasks, goals, and bond subscales, respectively. An analysis of the correlations among the three subscales showed significant overlap, ranging from 0.75 to 0.80, and this is consistent with results obtained by psychotherapy research (Tracey & Kokotovic, 1989). A principal components analysis with varimax rotation and kaiser normalization of the PPWA yielded a one factor solution with structure coefficient values ranging from 0.62 to 0.86 (eigen value of 7.11 explaining 59% of the variance). Given Fuertes et al.’s (2007) results the overall scale was treated as a general measure of the alliance. The resident physician completed the PPWA as part of the Resident Post-Visit Form and patient completed the PPWA as part of the Patient Post-Visit Form.

Medical Patient Satisfaction Questionnaire – 11. The 11-item MPSQ (Fuertes, et al., 2007) was designed by Fuertes and colleagues (2007) to assess patient satisfaction with a variety of treatment aspects, such as quality of treatment, appointment-making, etc. Item responses consist of a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Internal consistency has been deemed adequate, with an alpha coefficient of .91.

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Factor analysis yielded two factors; patient satisfaction with direct contact with doctor (6 items) and patient satisfaction with indirect services (5 items) (Fuertes, et al., 2007). The patient completed the MPSQ as part of the Patient Post-Visit Form and the Patient Follow-Up Form.

Group-Based Medical Mistrust Scale – 12. The 12-item GBMMS (Thompson, Valdimarsdottir, Winkel, Jandorf, & Redd, 2004) was designed to assess suspicion of mainstream health care systems, health care professionals, and treatment provided to individuals of the respondents' ethnic or racial group. The response key is a 5 point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scores range from12 to 60 (Thompson, et al., 2004). Three subscales exist within the GBMMS; Suspicion, Group Disparities in Health Care, and Lack of Support from Health Care Providers. During scale development, authors of the GBMMS developed eight items based on the literature on medical mistrust (Thompson, et al., 2004). They also took two items from the Cultural Mistrust Inventory and two items from the Perceptions of Racism Scale. Psychometric properties were assessed using a sample of 79 African American and 89 Latina women with breast cancer (Thompson, et al., 2004). Internal consistency was found to be high for the total GBMMS with an alpha coefficient of .83. Split-half reliability was fairly high with a correlation of .75, which suggests that all 12 items consistently assess mistrust. Convergent validity was confirmed through negative associations between total mistrust and suspicion scores and acculturation (Thompson, et al., 2004). Although the GBMMS was designed with a breast cancer sample in mind, the authors indicated that it can be applied to broader health care issues (Thompson, et al., 2004) and the measure has been used with urban African

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American Primary Care patients (Benkert, Hollie, Nordstrom, Wickson, & Bins-Emerick, 2009). The patient completed the GBMMS as part of the Patient Post-Visit Form.

MALAT – 4. The MALAT-4 was a set of 4 items (Malat, van Ryn, & Purcell, 2009) that evaluated the influence of doctor race and nativity. Two specific dimensions of attitudes about doctor race were assessed: belief about doctors' knowledge about one's health problems and expected comfort with interpersonal interaction. The items asked respondents whether they agreed or disagreed with the following statement, "In general, doctors understand my health problems better when they are the same race as me rather than a different race." To measure expected comfort with different-race doctors, the items ask respondents whether they agree or disagree with the following statement, "In general, I feel more at ease when the doctor is the same race as I am." Similar questions assessed nativity. Respondents were asked, "In general, doctors understand my health problems better when they are from the United States rather than from a different country," and, "In general, I feel more at ease when the doctor is American born rather than from another country." The internal consistency reliability alpha coefficient for the items in the present study was 1.00. The patient completed the MALAT-4 as part of the Patient Post-Visit Form.

Medical Outcomes Study Measures of Patient Adherence – 5. The MOS-5 (Hays, 1994) provided a global indication of patient adherence by asking subjects to indicate how often during the past four weeks certain behaviors were true. The measure summarized a patient's tendency to adhere to medical recommendations using five items. The internal consistency reliability of the scale is acceptable (alpha = 0.81). To score general adherence, the responses to the five general adherence items were averaged after reversing the scoring of items 1 and 3. The patient completed the MOS-5 as part of the Patient Follow-Up Form.

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Measures of Biological Variables. Patient biological variables were hypothesized to be associated with differences in the physician-patient interaction. Thus, the date of the patient's first visit with the current doctor, the number of visits a patient had with the current doctor, and the number visits a patient had at the primary care clinic were collected. In addition, biological measures (e.g. health literacy score, pain score, blood pressure, weight, height, A1C level, cholesterol & triglyceride levels, vaccination status) were collected on two occasions from the patient's medical record if available. Time point one contained the variable of interest for the closest instance at or before the enrollment visit. Time point two contained the variable of interest for the next instance after the enrollment visit.

Procedure

Screening and Informed Consent Procedures for Resident Physicians. All resident physicians in the Internal Medicine Residency Training Program at VCU/VCUHS who treated patients in the Primary Care Clinics at Virginia Commonwealth University Health System (VCUHS) were invited to participate in the study. Residents received the study advertisement via email and as a paper document placed in their box. The study advertisement was also placed in appropriate clinic locations that were approved by the clinic manager. Residents who were interested in participating in the study contacted Daniel Baughn. Residents who were interested in participating in the study also directly approached Daniel Baughn as he was a member of the Primary Care team and interacted regularly with residents about the behavioral health needs of patients that had been referred to the Primary Care Psychology Clinic. The Primary Care Psychology Clinic was an on-site clinic established to address traditional mental health needs and to provide preventative health interventions to patients across the life cycle. Doctoral students in Clinical Psychology were

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supervised by a licensed Clinical Psychologist and provided treatment to patients. Residents who were interested in participating in the study met with a study researcher in a private area such as an available exam room, office room, or a secluded work area. The study researcher provided a verbal overview of the study, reviewed the risks and benefits of participating in the study, and explained the rights of study participants. A copy of the informed consent document was provided to the participant and the original was stored separate from all participant data in a locked file cabinet in the office of the research coordinator. The participants were informed that although medical staff in the clinic and the attending physicians may have been aware of their participation in the study, they did not have access to their responses. In addition, the participant was informed that all of his/her responses were associated with an ID number known only to the research coordinator and that the identification key linking the participant's name to his/her ID number was destroyed once the data collection phase of the study had concluded. Furthermore, none of the participant's responses were evaluated prior to the conclusion of the data collection phase of this study.

Screening and Informed Consent Procedures for Patients. Potential participants were eligible if their resident physician had consented to participate in the study. Clinic staff and study researchers (graduate students in clinical psychology and advanced undergraduate psychology students) in the clinic identified potential participants after they had arrived for their medical appointments and checked in with the clinic staff. Potential participants were told about the study and provided with a patient study advertisement. If the potential participant indicated an interest in the study, they met with the research coordinator in a private area such as an available exam room, office room, or a secluded work area to complete the informed consent. The patient's current location in the clinic was

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communicated to the clinic/nursing staff at all times by a study researcher to ensure that the patient's medical care was not delayed by participating in the study. The research coordinator provided a verbal overview of the study, reviewed the risks and benefits of participating in the study, and explained the rights of study participants. A copy of the informed consent document was given to the patient and the original was stored separate from all participant data in a locked file cabinet in the office of the research coordinator. The potential participant was informed that while their medical staff and physician were aware of their participation in the study, they did not have access to their responses. Participants were informed that their decision to participate (or not to participate) did not influence their medical care. In addition, participants were informed that all of their responses were associated with an ID number known only to the research coordinator and that the identification key linking the participant's name to his/her ID number was destroyed once the data collection phase of the study had concluded. Last, participants were asked to provide a phone number where they could be contacted for the confidential telephone follow-up call that occurred approximately 4 weeks after their enrollment visit. The participant's name, phone number, and medical record number were maintained in a password protected and encrypted file by the research coordinator.

Data Collection Procedures for Resident Physicians. After the research coordinator had provided informed consent, resident physicians were provided with a Resident Enrollment Form (see Appendix A) to complete. Enrolled resident physicians were reminded that while medical staff in the clinic and attending physicians may have been aware of their participation in the study, they did not have access to their responses and none of their responses were evaluated prior to the conclusion of the data collection phase of the study. On

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the day of a visit with a patient who had enrolled as a participant, an audio recorder was placed in the exam room to capture the audio interactions between the resident and the patient. A study researcher, prior to the physician-patient consultation, activated the audio recorder and the researcher was not present during the consultation. As we did not want to alter the natural communication process during consultations, in cases where patient or physician full names were mentioned during the recording the researcher deleted the names from the recording immediately after the consultation. A study researcher retrieved the audio recorder at the end of the consultation. The audio recordings were not analyzed for this study. After the patient visit, the resident physician was asked to complete the Resident Post-Visit Form (see Appendix A). It took the resident physician less than 4 minutes to complete the form. The resident physician returned the completed Resident Post-Visit Form to a study researcher within a few moments following the patient visit or before the end of the clinic day. The identification key linking the participant's name to his/her ID number was destroyed once the data collection phase had concluded.

Data Collection Procedures for Patients. After the research coordinator had provided informed consent, participants were provided with a Patient Enrollment Form (see Appendix A) to complete in a private area such as an available exam room, office room, or a secluded work area. Enrolled participants were reminded that while medical staff in the clinic and their physician were aware of their participation in the study, they did not have access to their responses. After the consultation with their physician, participants were asked to complete the Patient Post-Visit Form (see Appendix A) in a private area such as an available exam room, office room, or a secluded work area. A study researcher read the questions to the patients and it took participants approximately 10 minutes to complete the form. Patient

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companions were not asked to provide any demographic information or to complete study measures. Once the participant had completed the Patient Post-Visit Form, he/she was reminded that a study researcher would contact him/her approximately 4 weeks after their enrollment visit for the confidential telephone follow-up call. The participant was contacted by the research coordinator approximately 4 weeks later and was asked to complete the Patient Follow Up Form (see Appendix A) over the telephone. Patients who completed the Patient Follow Up Form were mailed a $5 gift card to Wal-Mart. Patients were categorized as lost-to-follow-up if after 10 attempts to re-initiate contact approximately four weeks after the enrollment visit proved unsuccessful. It is important to note that 16 (4.8%) patients were unable to complete the 4 week follow-up phone call due to no response/lost to follow-up (n = 9), patient requested to be removed from the study (n = 4), and patient administratively removed from the study due to difficulties understanding the follow-up questions (n = 3).

At the end of the data collection phase of the study, biological variables (e.g. health literacy score, pain score, blood pressure, weight, height, A1C level, cholesterol & triglyceride levels, vaccination status) were collected on two occasions from the patient's medical record if available (Appendix B). Time point one contained the variable of interest for the closest instance at or before the enrollment visit. Time point two contained the variable of interest for the next instance after the enrollment visit. The identification key linking the participant's name to his/her ID number, the participant's phone number, and the file containing the participant's medical record number were destroyed once the data collection phase of the study concluded.

Data Accuracy. The consistency between items recorded on paper and entered in the electronic database was evaluated. All items in the database from 50 randomly identified

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dyad interactions (e.g. physician and patient responses) representing 15% of the total data set were compared to the original paper forms to ensure that the data were consistent and correct. Only 15 items out of the 11,350 items queried were entered incorrectly and this resulted in 0.132% of error. Due to the fact that the percentage of error was less than one half of one percent, the inaccurate items were corrected and the analyses for reliability and validity were conducted. In addition, multiple imputation and full information maximum likelihood estimation procedures were not used to generate a complete data set as the SPSS Mixed Model procedure is robust enough to manage data sets when less than 5% of the data is missing (Heck, Thomas, & Tabata, 2010).

Results

Analyses for the present study were grouped into the following areas: a) descriptive data on the communication variables, b) evaluation of the assumptions for dyadic analysis, c) analysis of the degree of nonindependence among observations, d) estimating physician and patient contributions to variance in the communication measures, e) evaluation of data relating race, gender, and concordance to the communication variables, f) patient outcomes and the relation of patient outcomes to the communication variables, and g) evaluation of data pertaining to the relationship between race, gender, and concordance to the patient outcomes. All analyses were performed using IBM SPSS Statistics 20.

Descriptive Data on the Communication Variables

Descriptive statistics on all reciprocal communication variables are detailed in Table 4. Reciprocal variables are defined as those where the focal person served as both the source and the target of the data. In other words, both the doctor and patient provided data on the relationship between both parties and these data were used for the bivariate analysis of the

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one-with-many design of these dyadic data (Kenny & Kashy, 2011; Kenny, Kashy, & Cook, 2006c).

Patient scores on the communication variables were compared to normative reference groups. Compared to prior data from Campbell, Auerbach, and Kiesler (2007) in a study of 80 patients and 14 health care providers in a primary care student health center, patient scores on the Control subscale of the IMI-20 were .69 standard deviations below the normative mean of -.51 (*0.55*) and patient scores on the Affiliation subscale were .55 standard deviations above the normative mean of 1.84 (*0.77*). Overall, patients in this sample perceived their physicians to be less controlling and more affilaitive than patients from Campbell, et al. (2007).

Doctor scores on the Control subscale of the IMI-20 were .23 standard deviations below the normative mean of -.85 (*0.62*) and doctor scores on the Affiliation subscale were .08 standard deviations above the normative mean of 1.42 (*0.95*). Overall, doctors in this sample perceived their patients to be slightly less controlling and as having approximately the same level of Affiliation as doctors from Campbell, et al. (2007).

Measures of the physician-patient relationship were compared to prior data. Scores on the Control Complementarity subscale of the IMI-20 were .74 standard deviations above the normative mean of 1.38 (*0.83*) and scores on the Affiliation Complementarity subscale were .02 standard deviations above the normative mean of .95 (*0.89*). Scores on the Total Complementarity subscale were 0.56 above the normative mean of 2.33 (*1.13*). Overall, the physician-patient relationship in this sample was characterized by having less Control Complementarity, less Total Complementarity, and approximately the same level of

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Affiliation Complementarity present among doctors and patients when compared to prior data.

Patient scores on the PPWA-12 were much higher than Fuertes et al. (2009), which was composed of 152 patients from an urban outpatient medical center. A t-test examining the difference in patient scores on the PPWA-12 was significant, $t(477)=10.19$, $p < .01$, indicating that the patients in the present study reported significantly higher levels of the working alliance than did patients in Fuertes et al. (2009). Normative data were not available for the doctor version of the PPWA-12 and the PSPS-5 as both of these measures were created for this study.

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Table 4

Descriptive Statistics on All Reciprocal Communication Variables

Focal and Scale	N	Min.	Max.	M	SD	Normative Sample N	Normative Sample M	Normative Sample SD	t	df
Physician-Patient Relationship										
IMI-20 (Measures of the relationship)										
Control Complementarity	326	.00	4.40	1.99	1.03	80	1.3758	.83233	4.95**	404
Affiliation Complementarity	326	.00	3.60	.97	.77	80	.9527	.89300	.17	404
Total Complementarity	326	.00	5.80	2.96	1.07	80	2.3285	1.12838	4.68**	404
Resident										
IMI-20-Doctor (Doctor's perception of the patient)										
Dominant	328	1.00	4.00	1.51	.59	80	1.2690	.43537	3.43**	406
Hostile	328	1.00	4.00	1.42	.59	80	1.3132	.56451	1.46	406
Submissive	328	1.00	4.00	2.51	.59	80	2.1239	.62307	5.19**	406
Friendly	328	1.00	4.00	2.92	.65	80	2.7365	.59163	2.30*	406
Control	328	-2.80	1.20	-1.00	.70	80	-.8548	.62426	1.70	406
Affiliation	328	-1.80	3.00	1.50	.95	80	1.4233	.94562	.65	406
PSPS-5-Doctor										
Total	328	2.20	5.00	3.77	.53	-	-	-	-	-
PPWA-12-Doctor										
Total	329	17.00	60.00	48.00	8.37	-	-	-	-	-
Patient										
IMI-20-Patient (Patient's perception of the doctor)										
Dominant	328	.20	3.40	1.47	.52	80	1.3281	.33866	2.32*	406
Hostile	328	.40	3.60	1.14	.35	80	1.1238	.26064	.39	406
Submissive	328	1.00	4.00	2.35	.72	80	1.8391	.54891	5.94**	406
Friendly	328	1.20	4.00	3.40	.59	80	2.9623	.63815	5.85**	406
Control	328	-3.00	2.40	-.89	.84	80	-.5110	.55105	3.84**	406
Affiliation	328	-2.40	3.20	2.26	.80	80	1.8385	.76980	4.26**	406
PSPS-5-Patient										
Total	326	1.00	5.00	4.40	.75	-	-	-	-	-
PPWA-12-Patient										
Total	327	16.00	60.00	55.76	7.26	152	48.4	7.56	10.19**	477

Note.
The normative sample reference for the IMI-20 was Campbell, Auerbach, & Kiesler (2007). The normative sample reference for the PPWA-12-Patient was Fuertes, et al. (2009).
* $p \leq .05$, 2-tailed. ** $p \leq .01$, 2-tailed.

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The working alliance is a measure of patients' and physicians' respective views of the effectiveness of their relationship. As may be noted in Table 5 physicians' and patients' view of the strength of the working alliance was significantly but only moderately correlated (r=.29). The most prominent correlates of physicians' view of the strength of the alliance was their view of patients' affiliativeness (IMI) (r =.62), their own view of the extent to which they engaged patients in shared decision making (r=.51) and their perception of the patient as low in interpersonal control (r=-.48) during their encounter. The most prominent correlates of patients view of the strength of the alliance was their view of physicians being affiliative (r=.71), engaging in shared decision making (r=.66), and as exhibiting a low level of control behavior (r=-.49) during their encounter. The IMI measure of overall complementarity (designed to measure the extent to which there was an interpersonal match between physicians and patients in affiliation and control) was unrelated to physicians' view of the alliance but was moderately and significantly associated with patients' view of the alliance (r=.29).

Detailed in Table 6, across all 328 interactions, both patients and physicians were viewed by one another as being more submissive than dominant, more friendly than hostile, and overall more affiliative than controlling. These findings suggest that both doctors and patients viewed each other as engaging in a good interpersonal relationship.

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Table 5

Intercorrelations Between Interpersonal, Shared Decision Making, and Working Alliance Measures

Measure and subscale	1	2	3	4	5	6	7	8	9	10	11
Rating of the physician											
IMI-20-Patient (Patient's perception of the doctor)											
1. Control	-										
2. Affiliation	-.46**	-									
PSPS-5-Doctor											
3. Total	-.05	.03	-								
PSPS-5-Patient											
4. Total	-.34**	.61**	.07	-							
Rating of the patient											
IMI-20-Doctor (Doctor's perception of the patient)											
5. Control	.18**	-.29**	-.10	-.31**	-						
6. Affiliation	-.25**	.39**	.28**	.36**	-.72**	-					
Rating the Physician-Patient Relationship											
IMI-20											
7. Control Complementarity	-.69**	.32**	.03	.24**	-.68**	.54**	-				
8. Affiliation Complementarity	.01	.12*	-.18**	-.05	.50**	-.70**	-.31**	-			
9. Total Complementarity[a]	-.65**	.40**	-.11	.20**	-.29**	.01	.73**	.42**	-		
PPWA-12-Doctor											
10. Total	-.14*	.27**	.51**	.26**	-.48**	.62**	.31**	-.38**	.03	-	
PPWA-12-Patient											
11. Total	-.49**	.71**	.07	.66**	-.35**	.42**	.33**	-.05	.29**	.29**	-

Note.
[a]Total Complementarity reflects the interactive combination of doctor and patient scores on control and affiliation dimensions.
* $p \leq .05$, 2-tailed. ** $p \leq .01$, 2-tailed.

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Table 6

Results of a Paired Samples t-test for Interpersonal, Shared Decision Making, and Working Alliance Measures of Within Group Differences

Measure and compared scales	DOM	SUB	FRI	HOS	CON	AFF	t	df	p	d
Rating of the patient by the physician										
IMI-20-Doctor										
DOM compared to SUB[a]	1.51 (.59)	2.51 (.59)					-25.82	327	.00**	-1.70
FRI compared to HOS[b]			2.92 (.65)	1.42 (.59)			28.44	327	.00**	2.42
CON compared to AFF[c]					-1.00 (.70)	1.50 (.95)	-29.42	327	.00**	-3.00
Rating of the physician by the patient										
IMI-20-Patient										
DOM compared to SUB[e]	1.47 (.52)	2.35 (.72)					-19.14	327	.00**	-1.40
FRI compared to HOS[f]			3.40 (.59)	1.14 (.35)			51.43	327	.00**	4.66
CON compared to AFF[g]					-.89 (.84)	2.26 (.80)	-40.84	327	.00**	-3.84

Note. Standard deviations appear in parentheses below means.
[a]r = .28, $p \leq .01$, [b]r = -.17, $p \leq .01$, [c]r = -.72, $p \leq .01$, [d]r = .51, $p \leq .01$, [e]r =.11, $p = .06$, [f]r = -.39, $p \leq .01$, [g]r = -.46, $p \leq .01$
** $p \leq .01$, two-tailed.

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One-way ANOVAs were conducted to compare the means of interpersonal, shared decision making, and working alliance subscales of the physician to the means of the patients across all 330 interactions. Detailed in Table 7, physicians (as perceived by patients) were more submissive, hostile, and controlling than patients (as perceived by physicians), while patients were viewed (by physicians) as more friendly and affiliative as measured by the IMI. Patients rated their physicians as engaging in higher levels of shared decision making than the physicians rated their own level of shared decision making as measured by the PSPS. Similarly, although patients and physicians view of the working alliance was positively correlated (see above), patients on average reported a better working alliance than physicians (as measured by the PPWA). These findings suggest that despite higher levels of physician interpersonal submission, hostility and control, patients viewed the relationship as displaying high levels of shared decision making and a good working alliance.

Table 7

One-way ANOVA Results for Relationship Measures of Between Group Differences

Measure and subscale	Physician		Patient				
	M	*SD*	*M*	*SD*	*F*	*df*	*p*
IMI-20							
Dominance	1.51	.59	1.47	.52	.87	655	.35
Submission[a]	2.51	.59	2.35	.72	9.66	655	.00**
Friendliness[a]	2.92	.65	3.40	.59	99.81	655	.00**
Hostility[a]	1.42	.59	1.14	.35	55.10	655	.00**
Control[a]	-1.00	.70	-.87	.84	3.86	655	.05*
Affiliation[a]	1.50	.95	2.26	.80	125.31	655	.00**
PSPS-5							
Total[a]	3.77	.53	4.40	.75	155.83	653	.00**
PPWA-12							
Total[a]	48.00	8.37	55.76	7.26	160.58	655	.00**

Note.
[a]Significant Levene statistic; Homoscedasticity cannot be assumed.
* $p \leq .05$, two-tailed. ** $p \leq .01$, two-tailed.

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Evaluation of the Assumptions for Multilevel Modeling for Dyadic Data

Analysis of the degree of nonindependence. The interdependence of observations from a doctor and a patient who are both members of the same dyad is a core assumption of dyadic data analysis. The doctor influences the patient (i.e., actor effects), the patient influences the doctor (i.e., partner effects), and the dyad as a whole has a shared influence on each dyad member's scores. Nonindependence is defined as an instance when the two scores from the members of the dyad are more similar to (or different from) one another than two scores from two people who are not members of the same dyad. A fundamental assumption in statistical analyses is the idea of independent replication. Nonindependence challenges the idea of independent replication, which violates the key assumption of ANOVA and multiple regression because variance due to nonindependence in dyadic data may exist even after variation due to the independent variable has been controlled (Kenny, Kashy, & Cook, 2006b). Thus, using standard analytic techniques for dyadic data may result in increased Type I error rates (Kenny & Judd, 1986) and obscure important doctor and relationship-related factors that may affect physician-patient communication processes and outcomes (Marcus, Kashy, & Baldwin, 2009).

The degree of nonindependence in dyadic data should be reported (Kenny, et al., 2006b). Pearson product-moment correlations were conducted to determine the degree of nonindependence between the physician and patient versions of the communication measures because the data were interval-level and the dyad members were distinguishable. Detailed in Table 8, there were several significant correlations, which indicated that the independence of errors assumption had been violated and that the use, without accounting for non-independence of observations, of ANOVA and multiple regression would lead to biased or

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misleading conclusions. The average degree of nonindependence for the reciprocal communication measures in this study was .23.

Table 8

Correlations Between Doctor and Patient Communication Measures

Measure	*r*	*p*	N	95% Confidence Interval	
				Lower	Upper
IMI-20					
Control	.18	.00**	326	0.07	0.28
Affiliation	.39	.00**	326	0.29	0.47
PSPS-5					
Total	.07	.19	324	-0.04	0.18
PPWA-12					
Total	.29	.00**	326	0.19	0.39

Note.
* $p \leq .05$, two-tailed. ** $p \leq .01$, two-tailed.

Analysis of the assumption of distinguishability between dyad members.

Although it can be assumed that physicians and patients would be distinguishable members of a dyad, analyses were conducted to evaluate whether there were empirically meaningful differences between physicians and patients on the communication measures. Distinguishability was defined as the identification of a meaningful factor that can be used to order the two persons of the dyad. In addition, the identification of both theoretical and empirically meaningful distinguishability of dyad members was crucial to identifying the proper data-analytic technique (Kenny, Kashy, & Cook, 2006a).

Tests of equal variance were conducted using the framework outlined by Kenny, Kashy, and Cook (2006d) for dyadic data with a reciprocal design. Descriptive statistics on the means and standard deviations of the physician and patient communication measures were presented in Table 4. The sum and difference between physician and patient versions of each measure were correlated as this evaluated whether or not there was a difference in the variances between these two variables (Kenny, 1979). As detailed in Table 9, all of the

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correlations were statistically significant, which indicated that there were differences between the physician and patient variances on each of these measures. Thus, there was an empirically meaningful difference in scores on the communication measures between each member of the dyad.

Table 9

Correlations Between the Sum and Differences in Communication Measures

Measure	*r*	*p*	N	95% Confidence Interval	
				Lower	Upper
IMI-20					
Control	-.18	.00**	326	-.30	-.05
Affiliation	.19	.00**	326	.04	.36
PSPS-5					
Total	-.34	.00**	324	-.46	-.21
PPWA-12					
Total	.11	.05*	326	-.07	.29

Note.
* $p \leq .05$, two-tailed. ** $p \leq .01$, two-tailed.

Estimating the one-with-many reciprocal data design with multilevel modeling. In the reciprocal design, both the patient and the doctor provided scores for each lower level unit (i.e., every patient rated the relationship with the doctor and each doctor rated the relationship with every patient). The MLM equations for the reciprocal design were based on the two-intercept approach (Raudenbush, Brennan, & Barnett, 1995), in which two dummy variables were created to denote which person provided the outcome score. All analyses were performed using the restricted maximum likelihood (REML) method and the unstructured (UN) covariance structure. Focal and Partner were set as random variables in all models and Role was set as a repeated measures variable per guidelines established by Kenny and Kashy (2011). All predictor variables were set as fixed variables and centered using the 1 – 1/m and –1/m method described by Kraemer and Blasey (2004) where m referred to the number of categories.

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Variance partitioning with no predictor variables. The variance partitioning for the doctor-rated and patient-rated versions of the communication measures are reported in Table 10. The doctor accounted for a large (39.51%) but nonsignificant amount of variance in the patient-rated IMI-Control. In other words, among patients seeing the same doctor, there was not much consensus about the level of the interpersonal control manifested by the doctor. In contrast, a large (60.50%) and significant amount of the variance in the patient-rated IMI-Control could be attributed to the undifferentiated relationship, perceiver, and error variance component. The doctor-rated IMI-Control yielded significant perceiver and relationship variance. The doctor providing the rating accounted for 19.96% of the variance in these ratings. In other words, some doctors reported stronger interpersonal control than did other doctors. However, the majority of the variance (80.04%) in the doctor rating was attributed to the undifferentiated relationship, partner, and error variance component.

The doctor accounted for a large (25.80%) and significant amount of variance in the patient-rated IMI-Affiliation. In other words, among patients seeing the same doctor, there were some patients who reported stronger interpersonal affiliation than did other patients. However, 74.20% of the variance in the patient-rated IMI-Affiliation could be attributed to the undifferentiated relationship, perceiver, and error variance component. The doctor-rated IMI-Affiliation yielded significant perceiver and relationship variance. The doctor accounted for 30.56% of the variance in doctor-rated IMI-Affiliation. In other words, some doctors reported stronger interpersonal affiliation than did other doctors. However, the majority of the variance (69.44%) in the doctor rating was attributed to the undifferentiated relationship, partner, and error variance component.

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The doctor did not account for any appreciable variance in the patient-rated PSPS as the confidence interval included zero. The doctor-rated PSPS yielded significant perceiver and relationship variance. The doctor providing the rating accounted for 17.21% of the variance in these ratings. In other words, some doctors reported higher levels of shared decision making than did other doctors. However, the majority of the variance (82.79%) in the doctor rating was attributed to the undifferentiated relationship, partner, and error variance component.

The doctor accounted for a small (13.25%) and nonsignificant amount of variance in the patient-rated PPWA. In other words, among patients seeing the same doctor, there was not much consensus about the quality of the working alliance. In contrast, a large (86.75%) and significant amount of the variance in the patient-rated PPWA could be attributed to the undifferentiated relationship, perceiver, and error variance component. The doctor-rated PPWA yielded significant perceiver and relationship variance. The doctor providing the rating accounted for 35.77% of the variance in these ratings. In other words, some doctors reported a stronger working alliance than did other doctors. However, the majority of the variance (64.23%) in the doctor rating was attributed to the undifferentiated relationship, partner, and error variance component. Subsequent analyses (see dyadic reciprocity below) support the view that there is a substantial relational component to these alliance ratings. These variance partitioning estimates were virtually identical to other analyses with the inclusion of physician and patient race and gender as predictor variables. Thus, minimal variance was accounted for when additional variables were used.

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Table 10

Four Models of Variance Partitioning for Reciprocal Communication Measures

Measure and Rater	Proportion of variance			Total Variance
	Perceiver	Partner	Relationship + Error	
IMI-Control Model				
Patient Rating of Doctor	-	39.51	60.50*	0.102
Doctor Rating of Patient	19.96**	-	80.04**	0.864
IMI-Affiliation Model				
Patient Rating of Doctor	-	25.80*	74.20**	0.289
Doctor Rating of Patient	30.56**	-	69.44**	0.853
PSPS Model				
Patient	-	-17.65	117.65	0.029
Doctor	17.21**	-	82.79**	0.657
PPWA Model				
Patient	-	13.25	86.75**	18.352
Doctor	35.77**	-	64.23**	78.360

Note.
* $p \leq .05$ ** $p \leq .01$

Dyadic reciprocity with no predictor variables. The correlation between doctor and patient communication ratings subsumed two different processes: dyadic and generalized reciprocity. Dyadic reciprocity was estimated by correlating the relationship or unique effects from the doctor ratings with the relationship effects from the patient ratings. The dyadic reciprocity correlation estimated the extent to which a doctor who, for example, reported strong communication with a particular patient was seen by that patient as promoting strong communication in return. Generalized reciprocity was estimated by correlating the doctor partner effects (yielded by the patient ratings) with the doctor perceiver effects (yielded by the doctor ratings). The generalized reciprocity correlation estimated whether doctors who generally saw themselves as engaging in better communication with their patients were generally perceived by their patients as engaging in better communication (Kenny & Kashy, 2011; Marcus, et al., 2009).

Detailed in Table 11, there were several significant small and medium correlations. The dyadic reciprocity correlation was positive, small, and significant for the IMI-Control (*r*

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= .13, $p \leq .01$) and PSPS ($r = .11$, $p \leq .01$) while the generalized reciprocity correlations for both measures were not significant. This finding suggested that a small, but significant, portion of both interpersonal control and shared decision making was a function of the unique relationship between patients and their doctors. The dyadic reciprocity correlation was positive, medium, and significant for the IMI-Affiliation ($r = .35$, $p \leq .01$) and PPWA ($r = .35$, $p \leq .01$). This finding suggested that if, for example, a doctor reported an especially high rating of interpersonal affiliation or working alliance with a particular patient (better than with his or her other patients) then that patient was also likely to report high interpersonal affiliation or working alliance (better than those reported by the doctor's other patients). The generalized reciprocity correlations for IMI-Affiliation and PPWA were not significant. Overall, the variance partitioning and the reciprocity correlations strongly underscored the relational nature of the physician-patient relationship. These reciprocity estimates were virtually identical to other analyses with the inclusion of physician and patient race and gender as predictor variables. Thus, minimal variance was accounted for when additional variables were used.

Table 11

Four Models of Reciprocity for Reciprocal Communication Variables

	Reciprocity	
Measure	Dyadic	Generalized
IMI-Control Model	0.13**	[a]
IMI-Affiliation Model	0.35**	0.71
PSPS Model	0.11**	-0.11
PPWA Model	0.35**	0.27

Note.
* $p \leq .05$ ** $p \leq .01$
[a]This covariance parameter is redundant. The test statistic and confidence interval cannot be computed.

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Hypotheses Pertaining to the Relation between Race, Gender, Concordance, and Communication Variables

The multilevel model equations for a reciprocal design were based on the two-intercept approach where two dummy variables were created to denote which person provided the outcome score (Raudenbush, et al., 1995). The doctor dummy variable, FOCAL, was coded 1 if the data was provided by the doctor and 0 if the data came from the patient. The patient dummy variable, PARTNER, was coded 0 if the doctor provided the data and 1 if the data came from the patient. The use of two dummy variables allowed for the specification of model with separate intercepts for doctors' and patients' ratings in addition to separate residuals for doctors' and patients' ratings. As has been done in other One-With-Many multilevel designs (Kenny & Kashy, 2011; Kenny, et al., 2006c; Marcus, et al., 2009; Marcus, Kashy, Wintersteen, & Diamond, 2011), the analyses used in this study focused on the estimates of the average effects of the predictors on the outcome (i.e., the fixed effects estimates). Thus, random effects for both patients and doctors were included in the model to adjust the analyses for nonindependence.

The association between the communication measures and patient level predictors (Level 1; patient race, patient gender) and doctor level predictors (Level 2; doctor race, doctor gender) were evaluated. Patients (n = 8) and doctors (n = 4) who were classified in the "other" racial category were dropped from all analyses in order to evaluate the interactions between White doctors, Asian doctors, African American patients, and White patients. All of the predictor variables were centered using the 1 – 1/m and –1/m method described by Kraemer and Blasey (2004) where m referred to the number of categories. This type of centering was chosen in order to minimize the impact of multicollinearity and errors of

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statistical inference (Kraemer & Blasey, 2004) as well as to aid in the interpretation of the model (Paccagnella, 2006).

It should be noted that each of the tables presented below represented a different set of models that were unique to the specific dependent variable of interest. For example, three different models were presented for each dependent variable depicted in Tables 12-14 and 27-30. Model 1 represented the "intercepts only" model and was included to provide -2 log likelihood (-2LL) and Akaike Information Criterion (AIC) indicators of the relative goodness of fit of each statistical model with only the patient and doctor intercepts. Model 2 represented the "full model" as it included all predictor variables and also provided improved -2LL and AIC indicators over the "intercepts only" model. Model 3, if available, represented the "best fit" model and was the result of removing nonsignificant individual predictor variables. In some cases, the removal of nonsignificant predictor variables from Model 2 did not result in improved -2LL and AIC indicators. Thus, in these models it can be assumed that other unmeasured predictor variables were responsible for a portion of the variance. All results have been interpreted using Model 2 or Model 3 when available. Last, all of the models that used IMI Control as the dependent variable failed to converge despite the use of several techniques such as the removal of outliers, the replacement of outliers with the mean, and non-linear transformations such as log 10 and square root. Thus, IMI Control has been omitted from all analyses.

Patient race. Three variables that could reasonably be associated with patient race in this population were identified: patient income, patient education, and the distance from the patient's residence to the clinic. These variables, if not controlled, could confound the interpretation of any obtained patient race effects. Each of these variables were only

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moderately intercorrelated (all r's < .19) and therefore all three were entered as covariates in all analyses involving patient race as a predictor.

It was hypothesized that patient race would be associated with affiliation and shared decision making; specifically that physicians would be viewed as engaging in higher levels of affiliation and shared decision making with White vs. Non-White patients. Contrary to expectation, the relationships between patient rating of physician affiliation and patient race and between patient ratings of shared decision making and patient race were not significant. However, as detailed in Table 12, it was found that physicians viewed African American patients as engaging in higher levels of interpersonal affiliation than White patients. In addition, African American patients viewed their physicians as engaging in higher levels of interpersonal affiliation when compared to White patients. As detailed in Table 14, African American patients reported higher levels of the working alliance when compared to White patients. All other comparisons were not significant.

Patient gender. It was hypothesized that patient gender would be associated with affiliation, the working alliance, and shared decision making such that physicians would be viewed as engaging in higher levels of affiliation, shared decision making, and the working alliance with female vs. male patients. Detailed in Tables 12-14, these hypotheses were partially supported. Doctors of female patients viewed their patients as engaging in higher levels of interpersonal affiliation and shared decision making when compared to doctor ratings of male patients. There were no significant effects of patient gender on patient rated measures. All other comparisons were not significant.

Doctor race. Although there were no specific hypotheses pertaining to doctor race, significant relationships were found between interpersonal affiliation and doctor race and

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between the perceived strength of the working alliance and doctor race. As detailed in Table 12, White physicians viewed their patients as engaging in higher levels of interpersonal affiliation when compared to Asian physicians. Likewise, patients of White physicians viewed their doctors as engaging in higher levels of interpersonal affiliation when compared to patients of Asian physicians. In addition, patients of White physicians reported higher levels of the working alliance when compared to patients of Asian physicians (Table 14). All other comparisons were not significant.

Doctor gender. None of the hypotheses related to the relationship between physician gender and the physician-patient relationship were supported. As detailed in Tables 12-14, no relationship was found between doctor gender and patient perception of doctor involvement in shared decision making, doctor gender and patient perception of the strength of the working alliance, or between doctor gender and interpersonal affiliation. All other comparisons were not significant. In addition, the length of the medical visit was unable to be accurately measured due to clinic constraints and therefore the hypothesis that medical visits would be longer when the physician was female could not be evaluated.

Doctor gender by doctor race. Although there were no specific hypotheses pertaining to interaction between doctor gender and race, a significant relationship was found between shared decision making and doctor characteristics. As detailed in Table 11, Asian male physicians reported the lowest levels of shared decision making when compared to all other groups. All other comparisons were not significant.

Race concordance/discordance. It was hypothesized that race concordance would be associated with interpersonal communication, shared decision making, and the working alliance. Specifically, race concordant dyads were expected to result in lower ratings of

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physician and patient control and higher ratings of physician and patient affiliation. In addition, race concordant dyads were expected to result in higher ratings of shared decision making and better working alliance. Only one of these hypotheses were supported. As detailed in Table 12, patients in race concordant dyads (i.e. White patient with White doctors) viewed their physician as engaging in higher levels of interpersonal affiliation when compared to patients in race discordant dyads (i.e., White patients with Asian doctors, African American patients with White doctors, and African American patients with Asian doctors). All other comparisons were not significant.

Gender concordance/discordance. It was hypothesized that gender concordance would be associated with interpersonal communication, shared decision making, and the working alliance. Specifically, gender concordant dyads were expected to report higher physician and patient affiliation, higher shared decision making, and a better working alliance. In addition, gender discordance was hypothesized to be associated with higher levels of control, lower shared decision making, and a worse working alliance. As may be noted in Tables 12-14, none of these hypotheses were supported. It was also hypothesized that gender concordance would be associated with increased medical visit length. As noted above, the length of the medical visit was unable to be accurately measured due to clinic constraints and therefore this hypothesis could not be evaluated.

Covariates of patient affiliation, doctor shared decision making, and doctor working alliance. As noted above, covariates of patient race (income, patient education, and distance travelled by the patient to the clinic) were added to all models that evaluated the relationship between patient race, gender, concordance and the communication measures. However, two specific levels of patient education level proved to be the most robust

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covariates that remained in all models. Patient education was collapsed into four categories and dummy coded as less than 8th grade, started high school, completed high school or GED, and some college and above. Relevant findings are detailed below.

Started High School. Detailed in Tables 12 and 13, patients who reported starting high school viewed their physicians as engaging in lower levels of interpersonal affiliation when compared to patients in all other groups (i.e., 8th grade or less, completed high school or GED, and some college and above). In addition, doctors of patients who reported starting high school reported lower levels of shared decision making when compared to doctors of patients in all other groups (i.e., 8th grade or less, completed high school or GED, and some college and above). All other comparisons were not significant.

Some college and above. Detailed in Tables 13 and 14, doctors of patients who reported some college and above reported lower levels of shared decision making when compared to doctors of patients in all other groups (i.e., 8th grade or less, started high school , completed high school or GED) In fact, it is important to note in Table 13, that the interaction between doctor rating of shared decision making and the variable Patient Education: Completed High School/GED was a trend at p = .06. Thus, doctors reported lower levels of shared decision making when engaging with patients with educational levels higher than the 8th grade. Doctors of patients who reported some college and above viewed reported lower levels of the working alliance when compared to doctors of patient in all other groups (i.e., 8th grade or less, started high school, completed high school or GED) (Table 13). All other comparisons were not significant.

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Table 12

Fixed Effects Estimates for Models of Race, Gender, Concordance, and Other Covariates in Interpersonal Affiliation

Parameter	Model 1	Model 2	Model 3
		Fixed Effects Estimates	
IMI Affiliation			
Intercept Patient	2.26 (0.06)	2.11 (0.09)	2.14 (0.07)
Intercept Doctor	1.46 (0.10)	1.30 (0.12)	1.23 (0.11)
Patient view of doctor (Level 1)			
Patient Gender		-0.10 (0.11)	
Patient Race		0.26* (0.13)	0.27** (0.11)
Patient Gender*Patient Race		0.23 (0.22)	
Patient Income		0.05 (0.11)	
Patient Education: Started High School		-0.17 (0.15)	-0.21* (0.10)
Patient Education: Completed High School/GED		0.03 (0.15)	
Patient Education: Some College and Above		-0.05 (0.16)	
Patient Miles Travelled to Clinic: 0-15		-0.03 (0.12)	
Patient Miles Travelled to Clinic: 16-45		-0.16 (0.15)	
Doctor Gender		-0.08 (0.16)	
Doctor Race		-0.39* (0.17)	-0.37* (0.15)
Doctor Gender*Doctor Race		0.03 (0.32)	
Patient Gender*Doctor Gender (Gen. Con.)		0.19 (0.24)	
Patient Race*Doctor Race (Race Con.)		0.42 (0.24)	0.43* (0.21)
Race Concordance*Gender Concordance		0.19 (0.25)	
Doctor view of patient (Level 2)			
Patient Gender		0.22 (0.12)	0.21* (0.10)
Patient Race		0.15 (0.12)	0.24* (0.11)
Patient Gender*Patient Race		0.15 (0.23)	
Patient Income		-0.01 (0.12)	
Patient Education: Started High School		-0.00 (0.16)	
Patient Education: Completed High School/GED		-0.17 (0.16)	
Patient Education: Some College and Above		-0.18 (0.17)	
Patient Miles Travelled to Clinic: 0-15		0.02 (0.12)	
Patient Miles Travelled to Clinic: 16-45		0.05 (0.15)	
Doctor Gender		0.21 (0.23)	
Doctor Race		-0.51* (0.23)	-0.59** (0.22)
Doctor Gender*Doctor Race		0.61 (0.46)	
Patient Gender*Doctor Gender (Gen. Con.)		-0.33 (0.26)	
Patient Race*Doctor Race (Race Con.)		-0.16 (0.24)	
Race Concordance*Gender Concordance		-0.21 (0.26)	
-2*log likelihood	1377.1	1393.5	1366.0
Akaike's Information Criteria (AIC)	1389.1	1405.5	1378.0

Note. Standard errors in parentheses. Model 3 represented the "best fit" of the data.
* $p \leq .05$ ** $p \leq .01$

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Table 13

Fixed Effects Estimates for Models of Race, Gender, Concordance, and Other Covariates in Shared Decision Making

Parameter	Model 1	Model 2	Model 3
		Fixed Effects Estimates	
PSPS			
Intercept Patient	4.40 (0.05)	4.35 (0.07)	4.35 (0.05)
Intercept Doctor	3.80 (0.06)	3.80 (0.08)	3.83 (0.06)
Patient (Level 1)			
Patient Gender		-0.07 (0.10)	
Patient Race		0.17 (0.12)	
Patient Gender*Patient Race		0.04 (0.21)	
Patient Income		0.10 (0.10)	
Patient Education: Started High School		-0.05 (0.14)	
Patient Education: Completed High School/GED		-0.03 (0.14)	
Patient Education: Some College and Above		-0.06 (0.15)	
Patient Miles Travelled to Clinic: 0-15		-0.09 (0.11)	
Patient Miles Travelled to Clinic: 16-45		-0.21 (0.14)	
Doctor Gender		0.18 (0.12)	
Doctor Race		-0.22 (0.13)	-0.21 (0.11)
Doctor Gender*Doctor Race		0.20 (0.24)	
Patient Gender*Doctor Gender (Gen. Con.)		-0.25 (0.23)	
Patient Race*Doctor Race (Race Con.)		0.28 (0.22)	
Race Concordance*Gender Concordance		-0.02 (0.23)	
Doctor (Level 2)			
Patient Gender		0.11 (0.06)	0.11* (0.05)
Patient Race		0.08 (0.07)	
Patient Gender*Patient Race		-0.02 (0.12)	
Patient Income		-0.06 (0.06)	
Patient Education: Started High School		-0.17* (0.08)	-0.17* (0.08)
Patient Education: Completed High School/GED		-0.15 (0.08)	-0.15 (0.08)
Patient Education: Some College and Above		-0.19* (0.09)	-0.22** (0.08)
Patient Miles Travelled to Clinic: 0-15		-0.06 (0.06)	
Patient Miles Travelled to Clinic: 16-45		0.00 (0.08)	
Doctor Gender		-0.14 (0.15)	
Doctor Race		-0.07 (0.15)	
Doctor Gender*Doctor Race		0.31 (0.30)	0.49* (0.24)
Patient Gender*Doctor Gender (Gen. Con.)		0.02 (0.13)	
Patient Race*Doctor Race (Race Con.)		-0.07 (0.13)	
Race Concordance*Gender Concordance		0.03 (0.13)	
-2*log likelihood	981.1	1024.1	981.0
Akaike's Information Criteria (AIC)	993.1	1036.1	993.0

Note. Standard errors in parentheses. Model 3 represented the "best fit" of the data.
* $p \leq .05$ ** $p \leq .01$

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Table 14

Fixed Effects Estimates for Models of Race, Gender, Concordance, and Other Covariates in the Working Alliance

Parameter	Model 1	Model 2	Model 3
		Fixed Effects Estimates	
PPWA			
Intercept Patient	55.58 (0.54)	54.43 (0.76)	[a]
Intercept Doctor	47.91 (1.03)	47.78 (1.33)	[a]
Patient (Level 1)			
Patient Gender		0.30 (1.00)	[a]
Patient Race		4.18** (1.14)	[a]
Patient Gender*Patient Race		0.63 (1.98)	[a]
Patient Income		0.75 (0.99)	[a]
Patient Education: Started High School		-0.14 (1.37)	[a]
Patient Education: Completed High School/GED		-0.15 (1.37)	[a]
Patient Education: Some College and Above		-0.90 (1.45)	[a]
Patient Miles Travelled to Clinic: 0-15		-1.07 (1.05)	[a]
Patient Miles Travelled to Clinic: 16-45		-1.89 (1.30)	[a]
Doctor Gender		0.61 (1.30)	[a]
Doctor Race		-2.93* (1.36)	[a]
Doctor Gender*Doctor Race		3.14 (2.59)	[a]
Patient Gender*Doctor Gender (Gen. Con.)		0.36 (2.17)	[a]
Patient Race*Doctor Race (Race Con.)		3.90 (2.09)	[a]
Race Concordance*Gender Concordance		-0.43 (2.20)	[a]
Doctor (Level 2)			
Patient Gender		0.53 (0.92)	[a]
Patient Race		1.36 (1.05)	[a]
Patient Gender*Patient Race		2.03 (1.83)	[a]
Patient Income		0.62 (0.91)	[a]
Patient Education: Started High School		-1.44 (1.26)	[a]
Patient Education: Completed High School/GED		-1.75 (1.27)	[a]
Patient Education: Some College and Above		-2.63* (1.33)	[a]
Patient Miles Travelled to Clinic: 0-15		-0.07 (0.97)	[a]
Patient Miles Travelled to Clinic: 16-45		0.65 (1.18)	[a]
Doctor Gender		0.99 (2.58)	[a]
Doctor Race		-1.59 (2.60)	[a]
Doctor Gender*Doctor Race		4.43 (5.15)	[a]
Patient Gender*Doctor Gender (Gen. Con.)		-1.57 (2.02)	[a]
Patient Race*Doctor Race (Race Con.)		1.17 (1.92)	[a]
Race Concordance*Gender Concordance		1.61 (2.05)	[a]
-2*log likelihood	3803.9	3694.2	[a]
Akaike's Information Criteria (AIC)	3815.9	3706.2	[a]

Note. Standard errors in parentheses. Model 3 represented the "best fit" of the data.
[a] Unable to generate a model with a significant parameter or an improved -2LL or AIC indicator of a better fit.
* $p \leq .05$ ** $p \leq .01$

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Patient Outcomes

The association between the communication measures and patient outcomes (Level 1) such as patient health status, satisfaction, and adherence were evaluated. It is important to note that all of the independent variables used in these analyses were group mean centered to aid in the interpretation of the model (Paccagnella, 2006).

Descriptive data on patient outcomes. Descriptive data on the non-centered patient outcome measures are presented in Table 15. Patient scores on the SF-12v2 were transformed and standardized using a linear t-score transformation to have a mean of 50 and a SD of 10 based on normative data on this measure from the 1998 general U.S. population. Scores of 45 or greater are judged to indicate at least average overall functioning or well-being in each domain (Ware, et al., 2002). As may be noted in Table 15, compared to the general U.S. population patients on average reported impaired physical functioning at both the enrollment visit and the 4-week follow up visit, whereas mental health scores were within the average range at both time points. Patient scores on the Total MPSQ satisfaction measure at both time points were .75 standard deviations above the normative mean of 44.6 (*8.41*) in a sample of 118 patients with at least one chronic illness (Fuertes, et al., 2007). MPSQ scores were not standardized. Patient scores on the Group-Based Medical Mistrust Scale were .91 standard deviations below the normative mean of 28.32 (*9.43*) in a sample of 168 African American and Latina women who sought care in an urban medical center (Thompson, et al., 2004). GBMMS scores were not standardized. Patient scores on the Medical Outcome Study (MOS) adherence measure were 1.33 standard deviations above the normative mean of 19.2 (*3.78*) in a sample of sample of 152 patients from an urban medical clinic (Fuertes, et al., 2009). MOS scores were not standardized.

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Table 15

Descriptive Statistics on Non-Centered Patient Outcome Variables

Time Point and Scale	N	Min.	Max.	M	SD
Enrollment Visit					
SF12-v2[a]					
Physical Component Summary (PCS)	329	4.92	63.24	29.89	10.38
Mental Component Summary (MCS)	329	9.65	74.40	45.55	13.28
MPSQ-11					
Total Satisfaction	327	19.00	55.00	50.88	6.11
GBMMS-12					
Suspicion	327	6.00	26.00	9.33	4.46
Group Disparities in Health Care	326	2.00	15.00	5.22	2.89
Lack of Support from Health Care Providers	327	2.00	15.00	5.17	2.31
Total	326	12.00	44.00	19.71	7.80
4 Week Follow Up Visit					
SF12-v2[a]					
Physical Component Summary (PCS)	314	10.02	66.97	31.34	10.59
Mental Component Summary (MCS)	314	14.91	71.76	46.78	13.06
MPSQ-11					
Total Satisfaction	314	15.00	55.00	49.34	8.19
MOS-5					
Total	314	10.00	30.00	24.21	4.84

Note.
[a]1998 US Norm-Based Score Transformation.

Descriptive statistics on the patient biological measures are presented in Table 16. Biological measures were collected from the medical record at two time points. Time Point 1 was defined as the biological measure of interest for the closest instance at or before the enrollment visit. Time Point 2 was defined as the biological measure of interest for the next instance after the enrollment visit. Normative data were not available for these biological measures.

The time intervals in days between a specified time point and the biological measure collection date are detailed in Table 17. Negative values are interpreted as X days prior to the enrollment visit and positive values are interpreted as X days after the enrollment visit. It is important to note that clinical guidelines indicate that the interpretability of the biological measures are limited to those values obtained within a clinically interpretable time period of

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a specific time point. Per communication with Dr. Call, hemoglobin A1c was considered stable (valid) for approximately 30 days and self-reported pain score, blood pressure, weight, and cholesterol were considered stable for approximately 14 days. As detailed in Table 18, paired pre/post data within a clinically interpretable range was only available on approximately 24 patients and none of the relationships were significant.

Table 16

Descriptive Statistics on Biological Measures with Date Ranges Restricted to Clinical Guidelines

	N	Min.	Max.	M	SD
Patient					
Biological Measures at Time Point 1*					
Self-Reported Pain Score	323	0.00	10.00	4.44	3.77
Systolic Blood Pressure	326	88.00	209.00	136.00	19.76
Diastolic Blood Pressure	326	46.00	129.00	76.24	11.44
Weight	315	98.00	472.00	209.70	54.91
Body Mass Index	315	16.87	73.92	33.89	8.21
Total Cholesterol	68	109.00	263.00	168.47	35.80
HDL Cholesterol	68	22.00	84.00	45.62	13.94
LDL Cholesterol	68	43.00	163.00	94.91	27.50
Triglycerides	68	45.00	656.00	144.50	98.97
Hemoglobin A1c	85	5.20	11.20	7.62	1.48
Biological Measures at Time Point 2*					
Self-Reported Pain Score	22	0.00	10.00	3.64	3.69
Systolic Blood Pressure	24	62.00	163.00	125.79	22.11
Diastolic Blood Pressure	24	43.00	95.00	73.21	12.33
Weight	22	114.70	397.00	222.51	72.63
Body Mass Index	22	19.08	63.11	35.04	10.04
Total Cholesterol	2	188.00	255.00	221.50	47.38
HDL Cholesterol	2	41.00	48.00	44.50	4.95
LDL Cholesterol	2	119.00	162.00	140.50	30.41
Triglycerides	2	139.00	226.00	182.50	61.52
Hemoglobin A1c	11	6.40	12.50	9.32	1.98

Note. *Per communication with Dr. Call, hemoglobin A1c is considered stable (valid) for approximately 30 days and self-reported pain score, blood pressure, weight, and cholesterol were considered stable for approximately 14 days.

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Table 17

Time Interval in Days Between Biological Measure Collection Date Restricted to Clinical Guidelines and Time Point

	N	Min.	Max.	M	SD
Patient Biological Measures					
Time Point 1[1]					
Self-Reported Pain Score	323	0.00	4.00	0.12	.22
Systolic & Diastolic Blood Pressure	326	0.00	4.00	0.12	.22
Weight*	315	0.00	4.00	0.13	.23
Cholesterol (Total, HDL, LDL, & Triglycerides)	68	-7.00	0.00	-.10	.85
Hemoglobin A1c	85	-30.00	0.00	-3.24	8.17
Time Point 2[2]					
Self-Reported Pain Score	22	4.00	14.00	9.45	3.43
Systolic & Diastolic Blood Pressure	24	4.00	14.00	9.67	3.43
Weight*	22	4.00	14.00	9.41	3.45
Cholesterol (Total, HDL, LDL, & Triglycerides)	2	3.00	11.00	7.00	5.66
Hemoglobin A1c	11	7.00	30.00	16.82	7.63

Note. [1]Time Point 1 is defined as the variable of interest for the closest instance at or before the enrollment visit. Negative values are interpreted as X days prior to the enrollment visit. Positive values are interpreted as X days after the enrollment visit.

[2]Time Point 2 is defined as the variable of interest for the next instance after the enrollment visit. Positive values are interpreted as X days after the enrollment visit.

*BMI was calculated posthoc and shared the same collection date as the Weight biological measure.

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Table 18

Paired Samples Test of Biological Measures with Date Ranges Restricted to Clinical Guidelines

	N	t	p
Pairs			
1. Self-Reported Pain Score T1 Self-Reported Pain Score T2	22	1.59	.13
2. Systolic Blood Pressure T1 Systolic Blood Pressure T2	24	1.54	.14
3. Diastolic Blood Pressure T1 Diastolic Blood Pressure T2	24	1.70	.10
4. Weight T1 Weight T2	20	-.71	.49
5. Body Mass Index T1 Body Mass Index T2	20	-.74	.47
6. Total Cholesterol T1 Total Cholesterol T2	0	-	-
7. HDL Cholesterol T1 HDL Cholesterol T2	0	-	-
8. LDL Cholesterol T1 LDL Cholesterol T2	0	-	-
9. Triglycerides T1 Triglycerides T2	0	-	-
10. Hemoglobin A1c T1 Hemoglobin A1c T2	0	-	-

Note. *Per communication with Dr. Call, hemoglobin A1c was considered stable (valid) for approximately 30 days and self-reported pain score, blood pressure, weight, and cholesterol were considered stable for approximately 14 days.

Interrelationships among patient outcomes. The relationships between the patient outcome measures were assessed. As detailed in Table 19, physical health, mental health, and patient satisfaction at enrollment were strongly correlated with the same measures at the 4 week follow up visit. Patient satisfaction at enrollment and at follow up were negatively associated with all subscales of the GBMMS such that increases in mistrust of the healthcare system were associated with decreased satisfaction. Patient physical health and mental health status at both time points were positively correlated with total satisfaction (at both time points) and adherence (4 week follow up). Patient adherence (MOS-5) was weakly correlated with all variables in the expected directions.

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Table 19

Intercorrelations Between Patient Outcome Measures

Time Point and Scale	1	2	3	4	5	6	7	8	9	10	11
Enrollment Visit											
SF12-v2											
1. Physical Component Summary (PCS)	-										
2. Mental Component Summary (MCS)	-.07	-									
MPSQ-11											
3. Total Satisfaction	.13*	.16**	-								
GBMMS-12											
4. Suspicion	.07	-.10	-.35**	-							
5. Group Disparities in Health Care	-.02	-.03	-.30**	.44**	-						
6. Lack of Support from Health Care Providers	-.06	-.08	-.40**	.51**	.41**	-					
7. Total	.01	-.09	-.43**	.89**	.75**	.74**	-				
4 Week Follow Up Visit											
SF12-v2											
8. Physical Component Summary (PCS)	.70**	.10	.20**	.03	.04	-.11	.00	-			
9. Mental Component Summary (MCS)	.07	.73**	.13*	-.12*	-.12*	-.08	-.14*	-.02	-		
MPSQ-11											
10. Total Satisfaction	.16**	.15**	.72**	-.30**	-.27**	-.36**	-.38**	.27**	.16**	-	
MOS-5											
11. Total	.14*	.23**	.27**	-.13*	-.14*	-.12*	-.16**	.18**	.27**	.28**	-

Note.
* p ≤ .05, 2-tailed. ** p ≤ .01, 2-tailed.

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Hypotheses pertaining to the relationship between the communication variables and patient outcomes. Hypotheses related to the interaction between patient race, race concordance, gender concordance, and patient outcomes are discussed in a later section. Although no specific hypotheses were made regarding the main effects of the communication measures on the patient outcomes, there were several significant findings. Data on outcome measures were collected from patients at the enrollment visit and again approximately 4 weeks later via a follow up phone call. Change in patient scores on the physical health status, mental health status, and patient satisfaction measures were evaluated. Raw outcome scores were used for the patient adherence measure (i.e., MOS-5) as this measure was only collected at one time point.

Enrollment visit outcome variables.

Physical Health Status (SF12-v2 PCS). There was a significant interaction between physician rated working alliance and the patient's self-rated physical health status at enrollment such that higher levels of physician rated working alliance was associated with better patient physical health status at enrollment. This finding was detailed in Table 20.

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Table 20

Three Models of Fixed Effects Estimates for Enrollment Physical Health Status (SF12v2-PCS) in Communication Variables

Measure and Parameter	Estimate	*SE*	*df*	*t*	*p*
IMI-Affiliation Model					
Doctor Rating of Patient (Enroll PCS)	.008	.004	298.017	1.908	.06
Patient Rating of Doctor (Enroll PCS)	.003	.004	313.415	.656	.49
PSPS Model					
Doctor (Enroll PCS)	.003	.002	294.555	1.346	.18
Patient (Enroll PCS)	-.001	.004	312.977	-.213	.83
PPWA Model					
Doctor (Enroll PCS)	.070	.035	297.818	2.009	.05*
Patient (Enroll PCS)	.062	.038	308.625	1.614	.11

Note.
* $p \leq .05$ ** $p \leq .01$

Mental Health Status (SF12-v2 MCS). Detailed in Table 21, there were several significant findings related to this variable. Higher physician affiliation and working alliance were associated with better patient mental health status at enrollment. Higher patient shared decision making and working alliance were associated with better patient mental health status at enrollment.

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Table 21

Three Models of Fixed Effects Estimates for Enrollment Mental Health Status (SF12v2-MCS) in Communication Variables

Measure and Parameter	Estimate	*SE*	*df*	*t*	*p*
IMI-Affiliation Model					
Doctor Rating of Patient (Enroll MCS)	.010	.003	300.696	2.920	.00**
Patient Rating of Doctor (Enroll MCS)	.005	.003	314.793	1.525	.13
PSPS Model					
Doctor (Enroll MCS)	.002	.002	297.260	1.082	.28
Patient (Enroll MCS)	.006	.003	313.859	1.960	.05*
PPWA Model					
Doctor (Enroll MCS)	.062	.027	300.140	2.264	.02*
Patient (Enroll MCS)	.098	.030	310.922	3.318	.00**

Note.
* $p \leq .05$ ** $p \leq .01$

Patient Satisfaction (MPSQ-11). Patient satisfaction at enrollment was associated with every communication measure such that increased affiliation, increased shared decision making, and increased working alliance were all associated with higher levels of patient satisfaction as detailed in Table 22.

Table 22

Three Models of Fixed Effects Estimates for Enrollment Patient Satisfaction (MPSQ-11) in Communication Variables

Measure and Parameter	Estimate	*SE*	*df*	*t*	*p*
IMI-Affiliation Model					
Doctor Rating of Patient (Enroll MPSQ)	.051	.007	307.816	7.055	.00**
Patient Rating of Doctor (Enroll MPSQ)	.079	.006	324.537	13.880	.00**
PSPS Model					
Doctor (Enroll MPSQ)	.010	.004	301.231	2.674	.01**
Patient (Enroll MPSQ)	.073	.005	323.963	13.498	.00**
PPWA Model					
Doctor (Enroll MPSQ)	.350	.057	303.092	6.161	.00**
Patient (Enroll MPSQ)	.938	.040	324.454	23.370	.00**

Note.
* $p \leq .05$ ** $p \leq .01$

Residualized change in outcome variables. The residualized change score is the difference between the observed score at the follow up visit and the predicted score at the enrollment visit, where the enrollment visit score was used to predict the follow up visit score.

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Residualized change scores were calculated to adjust for baseline differences and to avoid the problems associated with the reliability of raw difference scores such as the increased error in the difference score due to addition of the error from both enrollment and follow up measures (MacKinnon, 2008). Positive residual change scores indicated an improvement while negative scores indicated a decline in the target domain.

Physical Health Status (SF12-v2 PCS) Residualized Change. As detailed in Table 23, there was a significant interaction between patient rating of the working alliance and change in physical health such that a better working alliance as reported by the patient was predictive of improved physical health at follow up. All other comparisons were not significant at $p \leq .05$

Table 23

Three Models of Fixed Effects Estimates for Physical Health Status (SF12v2-PCS) Residualized Change in Communication Variables

Measure and Parameter	Estimate	*SE*	*df*	*t*	*p*
IMI-Affiliation Model					
Doctor Rating of Patient (Phys Hlth Δ)	.005	.006	284.906	.823	.41
Patient Rating of Doctor (Phys Hlth Δ)	.004	.006	305.533	.677	.50
PSPS Model					
Doctor (Phys Hlth Δ)	-.005	.003	281.913	-.163	.87
Patient (Phys Hlth Δ)	.005	.006	304.123	.965	.34
PPWA Model					
Doctor (Phys Hlth Δ)	.040	.049	285.450	.825	.41
Patient (Phys Hlth Δ)	.117	.054	304.767	2.174	.03*

Note.
* $p \leq .05$ ** $p \leq .01$

Mental Health Status (SF12-v2 MCS) Residualized Change. As detailed in Table 24, there were no significant interactions between mental health residualized change scores and the communication measures.

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Table 24

Three Models of Fixed Effects Estimates for Mental Health Status (SF12v2-MCS) Residualized Change in Communication Variables

Measure and Parameter	Estimate	*SE*	*df*	*t*	*p*
IMI-Affiliation Model					
Doctor Rating of Patient (Ment Hlth Δ)	.006	.006	289.940	1.117	.27
Patient Rating of Doctor (Ment Hlth Δ)	.005	.005	308.339	.976	.33
PSPS Model					
Doctor (Ment Hlth Δ)	.005	.003	285.310	1.663	.10
Patient (Ment Hlth Δ)	.003	.005	306.730	.714	.48
PPWA Model					
Doctor (Ment Hlth Δ)	.071	.042	289.603	1.680	.09
Patient (Ment Hlth Δ)	-.002	.046	306.996	-.041	.97

Note.
* $p \leq .05$ ** $p \leq .01$

Patient Satisfaction (MPSQ-11) Residualized Change. As detailed in Table 25, there was a significant interaction between patient rating of shared decision making and change in patient satisfaction such that increased shared decision making as perceived by the patient was predictive of higher satisfaction at follow up. All other comparisons were not significant at $p \leq .05$.

Table 25

Three Models of Fixed Effects Estimates for Patient Satisfaction (MPSQ-11) Residualized Change in Communication Variables

Measure and Parameter	Estimate	*SE*	*df*	*t*	*p*
IMI-Affiliation Model					
Doctor Rating of Patient (Satisfaction Δ)	.011	.008	287.810	1.354	.18
Patient Rating of Doctor (Satisfaction Δ)	.008	.008	311.355	1.037	.30
PSPS Model					
Doctor (Satisfaction Δ)	-.003	.004	284.755	-.755	.45
Patient (Satisfaction Δ)	.016	.007	310.900	2.136	.03*
PPWA Model					
Doctor (Satisfaction Δ)	.040	.066	288.000	.614	.54
Patient (Satisfaction Δ)	.062	.072	310.965	.856	.39

Note.
* $p \leq .05$ ** $p \leq .01$

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Four week follow up outcome variables.

Patient Adherence (MOS-5). Patient self-reported adherence at the four week follow up was associated with every patient rated communication measure such that increased affiliation, increased shared decision making, and increased working alliance were all associated with higher levels of patient adherence as detailed in Table 26. Patient adherence at the four week follow up was associated with physician rated communication measures such that increased working alliance was associated with higher levels of patient adherence.

Table 26

Three Models of Fixed Effects Estimates for Follow Up Patient Adherence (MOS-5) in Communication Variables

Measure and Parameter	Estimate	*SE*	*df*	*t*	*p*
IMI-Affiliation Model					
Doctor Rating of Patient (F/U Adher.)	.014	.009	282.784	1.506	.13
Patient Rating of Doctor (F/U Adher.)	.036	.009	300.524	3.938	.00**
PSPS Model					
Doctor (F/U Adher.)	.009	.005	280.403	1.875	.06
Patient (F/U Adher.)	.038	.008	298.027	4.507	.00**
PPWA Model					
Doctor (F/U Adher.)	.220	.075	282.248	2.955	.00**
Patient (F/U Adher.)	.385	.081	297.716	4.741	.00**

Note.
* $p \leq .05$ ** $p \leq .01$

Hypotheses pertaining to the relationship between gender, race, concordance and change in patient outcomes. Hypotheses related to the interaction between patient gender, patient race, physician gender, physician race and change in patient outcome scores were evaluated. Enrollment scores as well as the nesting of patient scores within doctors were taken into account by setting the dependent variable to be the raw change score (i.e., follow up score minus enrollment score) and adding the enrollment visit score as a covariate to the multilevel model. Including the calculation of the raw change score in the multilevel model was more advantageous than the use of residualized change scores due to the unique structure of the

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nonreciprocal one-with-many model. Positive change scores indicated an improvement while negative scores indicated a decline in the target domain. As detailed in Tables 27-29 there were no effects of race concordance or gender concordance on change scores.

Change in physical health. There was a significant interaction of doctor race on change in physical health status. Detailed in Table 27, patients of White doctor status was predictive of increased physical health at follow up when compare to patient of Asian doctors. All other comparisons were not significant.

Change in mental health. There was a significant interaction of patient gender on change in mental health status. Detailed in Table 28, female patient status was predictive of increased mental health at follow up when compare to male patient status. All other comparisons were not significant.

Change in patient satisfaction. There were no significant interactions of gender, race, or concordance on change in patient satisfaction (Table 29).

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Table 27

Main Effects and Interactions for Gender, Race, Concordance and other Covariates in Change in Physical Health

Parameter	Model 1	Model 2	Model 3
		Fixed Effects Estimates	
Physical Health Δ (SF12v2-PCS)			
Intercept	1.79 (0.46)	1.05 (0.63)	[a]
Patient Gender		-0.71 (0.83)	[a]
Patient Race		0.13 (0.96)	[a]
Patient Gender*Patient Race		1.15 (1.67)	[a]
Patient Income		-0.12 (0.84)	[a]
Patient Education: Started High School		-1.39 (1.17)	[a]
Patient Education: Completed High School/GED		-1.19 (1.17)	[a]
Patient Education: Some College and Above		-1.67 (1.25)	[a]
Patient Miles Travelled to Clinic: 0-15		0.73 (0.89)	[a]
Patient Miles Travelled to Clinic: 16-45		-1.05 (1.10)	[a]
Doctor Gender		0.62 (1.06)	[a]
Doctor Race		-2.27* (1.11)	[a]
Doctor Gender*Doctor Race		-0.34 (2.11)	[a]
Patient Gender*Doctor Gender (Gender Concordance)		0.66 (1.80)	[a]
Patient Race*Doctor Race (Race Concordance)		0.99 (1.77)	[a]
Race Concordance*Gender Concordance		-0.41 (1.84)	[a]
-2*log likelihood	3786.8	3744.6	[a]
Akaike's Information Criteria (AIC)	3790.8	3748.6	[a]

Note. Standard errors in parentheses. Model 3 represented the "best fit" of the data.
[a] Unable to generate a model with a significant parameter or an improved -2LL or AIC indicator of a better fit.
* $p \leq .05$ ** $p \leq .01$

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Table 28

Main Effects and Interactions for Gender, Race, Concordance and other Covariates in Change in Mental Health

Parameter	Model 1	Model 2	Model 3
		Fixed Effects Estimates	
Mental Health Δ (SF12v2-MCS)			
Intercept	1.07 (0.59)	2.34 (0.86)	[a]
Patient Gender		2.64** (0.99)	[a]
Patient Race		-0.56 (1.13)	[a]
Patient Gender*Patient Race		-3.06 (1.97)	[a]
Patient Income		0.13 (0.98)	[a]
Patient Education: Started High School		-1.67 (1.38)	[a]
Patient Education: Completed High School/GED		-2.63 (1.38)	[a]
Patient Education: Some College and Above		-1.01 (1.47)	[a]
Patient Miles Travelled to Clinic: 0-15		-0.57 (1.05)	[a]
Patient Miles Travelled to Clinic: 16-45		1.81 (1.30)	[a]
Doctor Gender		-0.64 (1.53)	[a]
Doctor Race		1.57 (1.57)	[a]
Doctor Gender*Doctor Race		3.14 (3.04)	[a]
Patient Gender*Doctor Gender (Gender Concordance)		-0.27 (2.14)	[a]
Patient Race*Doctor Race (Race Concordance)		0.55 (2.09)	[a]
Race Concordance*Gender Concordance		1.56 (2.18)	[a]
-2*log likelihood	3972.4	3913.3	[a]
Akaike's Information Criteria (AIC)	3976.4	3917.3	[a]

Note. Standard errors in parentheses. Model 3 represented the "best fit" of the data.
[a] Unable to generate a model with a significant parameter or an improved -2LL or AIC indicator of a better fit.
* $p \leq .05$ ** $p \leq .01$

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Table 29

Main Effects and Interactions for Gender, Race, Concordance and other Covariates in Change in Patient Satisfaction

Parameter	Model 1	Model 2	Model 3
		Fixed Effects Estimates	
Patient Satisfaction Δ (MPSQ)			
Intercept	-1.43 (0.34)	-1.50 (0.48)	[a]
Patient Gender		0.09 (0.56)	[a]
Patient Race		-0.45 (0.64)	[a]
Patient Gender*Patient Race		0.70 (1.12)	[a]
Patient Income		0.50 (0.56)	[a]
Patient Education: Started High School		0.14 (0.79)	[a]
Patient Education: Completed High School/GED		1.49 (0.79)	[a]
Patient Education: Some College and Above		-0.77 (0.84)	[a]
Patient Miles Travelled to Clinic: 0-15		1.01 (0.60)	[a]
Patient Miles Travelled to Clinic: 16-45		0.97 (0.74)	[a]
Doctor Gender		0.75 (0.86)	[a]
Doctor Race		-0.58 (0.88)	[a]
Doctor Gender*Doctor Race		1.74 (1.70)	[a]
Patient Gender*Doctor Gender (Gender Concordance)		0.68 (1.23)	[a]
Patient Race*Doctor Race (Race Concordance)		0.14 (1.18)	[a]
Race Concordance*Gender Concordance		1.13 (1.25)	[a]
-2*log likelihood	3396.9	3360.0	[a]
Akaike's Information Criteria (AIC)	3400.9	3364.0	[a]

Note. Standard errors in parentheses. Model 3 represented the "best fit" of the data.
[a] Unable to generate a model with a significant parameter or an improved -2LL or AIC indicator of a better fit.
* $p \leq .05$ ** $p \leq .01$

Hypotheses pertaining to the relationship between gender, race, concordance and patient adherence. There was a significant effect of patient gender, patient race, and patient education on self-reported adherence at follow up. Detailed in Table 30, male patients reported higher levels of adherence at follow up when compared to female patients. African American patients reported higher levels of adherence at follow up when compared to White patients. In addition, there was a significant patient gender by patient race interaction on adherence, such that White female patients reported the lowest levels of adherence at follow up when compared to all other groups (i.e., African American Males, African American Females, and White Males). All other comparisons were not significant.

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Patient education level was a significant predictor of adherence. Patients who reported completing high school or GED reported lower levels of adherence when compared to all other groups (i.e., 8th grade or less, started high school, and some college and above). All other comparisons were not significant.

Table 30

Main Effects and Interactions for Gender, Race, Concordance and other Covariates in Patient Adherence.

Parameter	Model 1	Model 2	Model 3
		Fixed Effects Estimates	
Patient Adherence (MOS Total)			
Intercept	24.19 (0.23)	24.39 (0.36)	[a]
Patient Gender		-1.24** (0.48)	[a]
Patient Race		1.31* (0.54)	[a]
Patient Gender*Patient Race		2.75** (0.95)	[a]
Patient Income		0.28 (0.48)	[a]
Patient Education: Started High School		0.85 (0.67)	[a]
Patient Education: Completed High School/GED		-1.38* (0.67)	[a]
Patient Education: Some College and Above		-0.65 (0.72)	[a]
Patient Miles Travelled to Clinic: 0-15		0.21 (0.51)	[a]
Patient Miles Travelled to Clinic: 16-45		1.20 (0.63)	[a]
Doctor Gender		-0.22 (0.60)	[a]
Doctor Race		0.88 (0.63)	[a]
Doctor Gender*Doctor Race		0.07 (1.20)	[a]
Patient Gender*Doctor Gender (Gender Concordance)		0.39(1.03)	[a]
Patient Race*Doctor Race (Race Concordance)		-1.05 (1.00)	[a]
Race Concordance*Gender Concordance		-0.77 (1.06)	[a]
-2*log likelihood	3243.4	3175.0	[a]
Akaike's Information Criteria (AIC)	3247.4	3179.0	[a]

Note. Standard errors in parentheses. Model 3 represented the "best fit" of the data.
[a] Unable to generate a model with a significant parameter or an improved -2LL or AIC indicator of a better fit.
* $p \leq .05$ ** $p \leq .01$

Discussion

This study evaluated the associations between race, gender, concordance, communication, and patient outcomes in an ecologically valid manner with direct implications for the care of socially disadvantaged patients treated in safety net settings. These patients experience higher rates of chronic illness (Ayanian, Weissman, Schneider, Ginsburg, & Zaslavsky, 2000), disease burden (Blankfield, Goodwin, Jaén, & Stange, 2002; Zahran, et al.,

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2005), psychological distress (Bierman, Lawrence, Haffer, & Clancy, 2001), and behavioral risk factors such as poor diet, physical inactivity, and smoking (Blankfield, et al., 2002; Centers for Disease Control and Prevention, 2007; Lantz, et al., 2001) in addition to lower rates of adherence (Bosworth, et al., 2006; R. C. Kaplan, Bhalodkar, Brown Jr, White, & Brown, 2004; Schneider, Kaplan, Greenfield, Li, & Wilson, 2004) and medical visits that frequently require more complex care (Bierman, et al., 2001; Mercer & Watt, 2007). In short, these patients overwhelm the current system of acute care focused treatment and when they receive care, it is typically of poorer quality (Derjung M. Tarn, et al., 2006; D. M. Tarn, et al., 2006). Starting in 2014, the health care system in the United Stated will experience an unprecedented influx of approximately 23 million uninsured and 17 million underinsured Americans due to the Affordable Care Act (Foster, 2010). In addition, an estimated 24 million Americans will remain uninsured even after ACA expansion, including undocumented persons, and these individuals are likely to use the safety net system for their care (M. H. Katz, 2011). Simply expanding access to a system of health care that has a record of inadequately treating socially disadvantaged populations will not fully address the health care needs of this population. Little is known about the role of physician and patient characteristics such as race (Meghani, et al., 2009) and gender (Hall & Roter, 2002; D. L. Roter & Hall, 2004) on the relationship between socially disadvantaged patients and primary care physicians.

The present study is an extension of the prior physician-patient literature and it specifically focused on evaluating the role of race and gender on the physician-patient communication process and patient outcomes in a safety net primary care clinic composed of 330 low-income, uninsured/underinsured African American and White patients and 41 resident physicians. The interpersonal, shared decision making, and working alliance processes occurring

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both within and between the physician and patient were assessed using self-report measures. Multilevel analyses using the One-With-Many (OWM) model were used to assess hypotheses while controlling for covariates and the nested nature of the data. First, the ideal physician-patient relationship and the characterization of the relationship between the doctor and the patient is reviewed. Second, the role of race, gender, and concordance in the physician-patient relationship are explored. Third, the role of physician-patient communication, race, gender, and concordance in patient outcomes are presented. In addition, gender and race concordance findings are discussed. Next, the limitations of the study are outlined. Last, the practice implications and future research are discussed.

The Physician-Patient Relationship

The ideal physician-patient relationship is composed of communication that is low in dominance and high in submission (i.e., low interpersonal control), high in friendliness and low in hostility (i.e., high interpersonal affiliation), high in shared decision making, and high in the working alliance as perceived by both parties. In this study, physicians (as perceived by patients) were more submissive, hostile, and controlling than patients (as perceived by physicians), while patients were viewed (by physicians) as more friendly and affiliative (IMI). The interpersonal dynamics identified in the study characterized both parties as residing on opposite continuums of the Circumplex model of interpersonal behavior. In this model, complementarity is defined as a set of interpersonal messages expressed by the target that pull or evoke a reciprocal or counterbalancing response by the recipient such as a "hostile-dominant" message pulling for a "hostile-submissive" response. In this study, the physician interpersonal message of "hostile-submissive" pulled for a "friendly-submissive" response by patients. Kiesler (1983) identified this interpersonal pattern as anticomplementarity, which is defined as when an interpersonal

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message evokes a reaction from the recipient that is a rejection of the target's invitation to engage in dialogue. Unfortunately, anticomplementary interactions are the least rewarding type of interpersonal dialogue and leave few opportunities for collaborative engagement (Kiesler, 1983, 1996). Previous findings with surgery patients have found that high physician hostility as perceived by the patient has been associated with patients who are less well adjusted during surgery (Auerbach, et al., 1983; Frantsve, 2002) and with patients who have an unfavorable response to diabetes treatment (Auerbach, Meredith, Alexander, Mercuri, & Brophy, 1984). In brief, there appears to be a consistent association between high physician affiliation (i.e., low hostility, high friendliness), low physician control (i.e., low dominance, high submission), and better patient satisfaction and adherence (Kiesler & Auerbach, 2003).

In this study, patients rated their physicians as engaging in higher levels of shared decision making than the physicians rated their own level of shared decision making (PSPS). Patients on average also reported a better working alliance than physicians (PPWA). Although shared decision making is frequently criticized for lacking a firm conceptualization, it is generally defined as the process by which patients and physicians jointly make health care decisions (Légaré, et al., 2012). Patients prefer to be actively involved in the health care decision making process (Kiesler & Auerbach, 2006). Patient participation in decision making has consistently been associated with better outcomes such as higher quality of life, higher physical and social functioning, and less fatigue (Hack, Degner, Watson, & Sinha, 2006). A recent systematic review of the literature found that patient engagement in shared decision making is closely linked to increased patient satisfaction (Stacey, et al., 2011).

Overall, the relationship between doctors and patients in this study suggest that despite higher levels of physician interpersonal submission, hostility, and control, patients viewed the

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relationship as displaying high levels of shared decision making and a good working alliance. Although this exact relationship has not been obtained in other studies, a partial explanation for this finding may be that the patients in this primary care setting preferred to have providers who exerted more control. This hypothesis has been put forth by other studies that found patient preference for control appears to exist on a continuum and patients who are more acutely ill tend to prefer for their provider to take a more dominant role (Auerbach, 2001). All of the patients in the study were diagnosed with a chronic disease such that 98% had hypertension, 43% had type II diabetes mellitus, and 43% had both hypertension and diabetes mellitus. It has been suggested that patients in primary care may feel overwhelmed by being presented with several options to manage both acute and chronic medical conditions and that these patients may prefer that their physicians engage in higher levels of dominance and control as this physician behavior is more conducive for treatment (Davis, Hoffman, & Hsu, 1999; Flynn, et al., 2012).

The Role of Race, Gender, and Concordance on the Physician-Patient Relationship.

Race. Race appeared to influence both patients' and doctors' perceptions of interpersonal affiliation and the working alliance. For example, African American patients viewed their physicians as engaging in higher levels of interpersonal affiliation when compared to White patients. Similarly, doctors of African American patients viewed their patients as engaging in higher levels of interpersonal affiliation when compared to doctors of White patients. Thus, there appeared to be a reciprocal acknowledgement by both parties that African American patients and their physicians engaged in higher levels of affiliation than White patients and their physicians.

Patients of White physicians viewed their doctors as engaging in higher levels of interpersonal affiliation than patients of Asian physicians. Similarly, White physicians viewed their patients as engaging in higher levels of interpersonal affiliation when compared to Asian

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physicians. Thus, there appeared to be a reciprocal acknowledgement by both parties that White physicians and patients of White physicians engaged in higher levels of affiliation than Asian physicians and their patients. Thus, Asian physicians and patients of Asian physicians reported the lowest levels of affiliation.

African American patients reported higher levels of the working alliance when compared to White patients. Patients of White physicians reported higher levels of the working alliance when compared to patients of Asian doctors. Similar to findings on interpersonal affiliation, African American patients and patients of White physicians reported higher levels of the working alliance when compared to all other groups.

In brief, there were patient and physician race main effects on interpersonal affiliation and the working alliance. African American patients and their doctors and White doctors and their patients were viewed as engaging in the highest levels of interpersonal affiliation and the working alliance. A logical conclusion based on these findings would be that perhaps African American patients with White doctors would display the highest levels of interpersonal affiliation and the working alliance. However, this was not the case for both patient and doctor reported affiliation. In fact, patients in race concordant dyads (i.e., White doctors interacting with White patients) reported higher levels of interpersonal affiliation when compared to patients in race discordant dyads (i.e., White doctors interacting with African American patients, Asian doctors interaction with White patients, and Asian doctors interaction with African American patients). This finding was surprising given that White patients were viewed by doctors as being significantly less affiliative than African American patients, but it does suggest that the effect of race concordance upon socially disadvantaged White patient populations is robust.

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Despite studies that suggest compelling support for racial differences, a recent review found "no clear pattern of findings" related to the relationship between race/race concordance and patient-provider communication (Meghani, et al., 2009). However, it is important to note that the discrepancy between the findings of this study and those cited here might be due to the use of various study methodologies. For example, the majority of the studies cited used either surveys (R. L. Johnson, S. Saha, et al., 2004; Manfredi, Kaiser, Matthews, & Johnson, 2010; Martin, Shi, & Ward, 2009), observation/coder impressions (Cene, Roter, Carson, Miller, & Cooper, 2009; Siminoff, Graham, & Gordon, 2006; Street Jr, Gordon, & Haidet, 2007), patient and physician self-report (Moskowitz, et al., 2011), or patient and physician self-report plus observation/coder impressions (Clark, et al., 2004). Thus, these discrepant findings may be due to methodological differences in the studies.

Gender. Patient gender appeared to influence physicians' perceptions of interpersonal affiliation and shared decision making. Physicians were hypothesized to view female vs. male patients as less controlling, more affiliative, and engaging in higher levels of shared decision making and the working alliance. This hypothesis was partially supported as physicians viewed female patients as engaging in higher levels of interpersonal affiliation (but not control) and shared decision making when compared to male patients. First, to the author's knowledge, there are no other studies that have specifically evaluated the physician's perspective (i.e., not a third observer perspective) of the patient based on gender. Thus, this finding is unique due to the fact that it represents the physician's opinion of the patient's interpersonal impact. Second, this finding is consistent with other observations of female patient behavior. For example, Bertakis, et al. (2009) in a study of unannounced standardized patient interactions with 100 family physicians and internists found that female patients had interactions with their physicians that

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were more patient-centered vs. male patients. Bertakis and Azari (2007) in a study of 509 primary care patients and 105 physicians found that female patients engaged in more discussions related to therapeutic interventions than male patients. S. H. Kaplan, et al. (1995) in a sample of 8,316 patient visits found that female patients engaged in much higher levels of participatory behavior than male patients. Overall, female patients have been viewed to engage in more affiliative and participatory behavior than male patients. However, it is important to note that this finding may also be the reflection of gender based demand characteristics where physicians may feel a social expectation to react in ways that value affiliative nonverbal cues such as smiling and discussions of personal information about family or work when interacting with female patients.

It was surprising to find no relationship between physician gender and the communication measures given the extensive support of physician gender findings reviewed by Roter & Hall (2004) and Roter, Hall, & Aoki (2002), which were reviewed in the Introduction. One hypothesis for the lack of physician gender findings is simply that the male and female physicians were equally skilled at providing patient-centered care. Roter et al. (2002) in a meta analytic review of the physician gender literature noted that there are far more similarities between the communication styles of male and female physicians than differences. In fact, Roter & Hall (2006c) concluded that it would be erroneous to conclude that one gender would be better (or worse) at providing effective communication despite findings that suggest that female physicians (and women in general) may be more naturally inclined toward patient centered care by providing encouragement and reassurance more frequently than male physicians.

Another hypothesis for the discrepancy between findings from this study and the research literature may be due to methodological differences. For example, the majority of the studies that have found significant associations between doctor-patient communication and doctor gender

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relied upon third party observations and coding methodology whereas the current study relied upon patient and physician self-report. Thus the discrepancy may stem from the varying methodologies, samples, and limitations of studies. Unfortunately, coded data from the audio recordings from this study were not included in the analyses for the present study.

Doctor gender by doctor race interaction. There was a significant physician gender by race interaction on shared decision making such that Asian Male physicians reported the lowest levels of shared decision making when compared to all other groups. Approximately 12% of physicians in the United States identify as Asian (American Medical Association, 2012) and this is the largest and historically overrepresented minority group of physicians (Myers & Fealing, 2012). We unfortunately are not able to provide a breakdown between subgroups of East Asian or South Asian physicians in the present sample.

Patient education level. Patient education level was a significant covariate of patient reported affiliation and doctor reported shared decision making and the working alliance. Patients who reported starting high school viewed their physician as engaging in lower levels of interpersonal affiliation when compared to patients in all other groups (e.g. 8th grade or less, completed high school/GED, and some college). Interestingly, patient reported affiliation was the only variable where education level impacted patient ratings. The role of education level on this particular variable is unclear since higher levels of patient education (i.e., completed high school/GED and some college) were not significantly associated with patient reported affiliation. Thus, there does not appear to be a linear relationship between patient education level and patient reported variables.

In contrast to patient reported variables, the role of patient education level in doctor reported variables was much more clear. For example, doctors reported lower levels of shared

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decision making when interacting with patients with educational levels higher than the 8th grade. In addition, doctors reported lower levels of the working alliance when interacting with patients with educational levels at some college and above. Thus, patient education level influenced physicians' perceptions of their patients to the extent that patients with higher educational levels were viewed as engaging in less shared decision making and having a poorer working alliance. It is not uncommon for socially disadvantaged patients with higher levels of education to exert more control over the relationship with the doctor as a form of patient activism (Jensen, King, Guntzviller, & Davis, 2010).

The Role of Race, Gender, and Concordance in Patient Outcomes.

Physical health. Better working alliance as reported by the patient was predictive of improved physical health (i.e., residualized change) at follow up. Patients of White doctors were more likely to have better physical health (i.e., change in physical health) at follow-up when compared to patients of Asian doctors. This is the first study, to the author's knowledge, to evaluate the role of Asian physicians on the doctor-patient relationship in the context of a safety net clinic predominately composed of African American patients. More than half of the Asian physicians in this sample were of South Asian decent. Unfortunately, as noted above, exact percentages are not available as providers did not delineate their racial background beyond the Asian category.

Findings from this study suggested that patients of Asian doctors were less likely to report improved physical health at follow up. This finding, combined with findings on Asian doctors and patients of Asian doctors discussed earlier, suggest that Asian physicians, and male Asian physicians in particular, may have difficulty forming a strong doctor-patient relationship and that the patients of these providers experience less improvement in their physical health

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when compared to patients of White doctors. One explanation for this finding is that Asian physicians may lack the cultural competency of knowing how to interact with socially disadvantaged African American and White patient populations. Unfortunately, no studies evaluating the interaction between Asian physicians and socially disadvantaged patients were found. Thus, we know little about this type of doctor-patient dyad. In fact, almost nothing is known about the practice patterns of Asian physicians other than what can be inferred based on information from international medical graduates (IMGs)(Mertz, Jain, Breckler, Chen, & Grumbach, 2007).

The lack of information on Asian physicians and South Asians in particular has direct implications for safety net clinics. First, we know nothing about the role of South Asian physicians who graduated from U.S. medical schools (Mertz, et al., 2007). Second, South Asians represent the largest group of IMGs at 19.9% (American Medical Association, 2007). Third, IMGs are more likely than U.S. medical graduates to enter generalist fields (American Medical Association, 2012; Mick, Lee, & Wodchis, 2000). Last, IMGs are more likely than U.S. graduates to practice in poor and underserved inner city and rural communities due to visa waivers that are obtained by IMGs once they agree to practice in physician shortage areas after the conclusion of their residency training (Mick, et al., 2000; Polsky, Kletke, Wozniak, & Escarce, 2002).

To the author's knowledge, this is the first physician-patient communication study to evaluate the interaction between Asian physicians and socially disadvantaged patients in the United States. The historical context of the interaction between patients and Asian (predominately South Asian) physicians in the United Kingdom suggests a significant history of racial discrimination against Asian providers and few opportunities for these doctors to gain

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experience with ethnic minority patients in the UK (Esmail, 2007). Although findings from this study need to be replicated, they suggest that Asian physicians may be culturally unaware of how to interact with underserved patients in the United States. Improving the communication skills of Asian providers may be one way to enhance the cultural competency of this group of physicians and to improve the quality of care delivered to socially disadvantaged patients.

African American patients were hypothesized to have poorer health status than White patients. However, this study found that there were no significant differences between African American and White patients in change in physical or mental health status. This finding was surprising given the compelling evidence that minority patients continue to face significant health disparities such as higher rates of chronic illness and death from diabetes, heart disease, and cancer than white patients (Centers for Disease Control and Prevention, 2011). However, this finding does suggest that the health status of socially disadvantaged African American patients is similar to that of socially disadvantaged White patients. It is clear that more research is needed to better understand the factors influencing the health status of socially disadvantaged patients.

Mental health. Female patients were more likely to have improved mental health (i.e., change in mental health) at follow-up when compared to male patients. To the author's knowledge, this study appears to be one of the first studies to find significant gender effects on mental health status. Sleath and Rubin (2002) in a study of 383 primary care visit encounters found that female patients were more likely to initiate talk about depression and psychotropic medication than male patients. Bertakis (2009) in a study of 509 patients in an academic primary care setting found that women had significantly higher levels of depression than men and were significantly more likely to be identified as depressed. Thus, one explanation for this finding may

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be that the female patients in this study were more likely to initiate a discussion about mental health symptoms with their doctor that may have led to a prescription for psychotropic medication or a referral to the in-house psychology service.

Satisfaction. Better shared decision making as perceived by the patient was predictive of improved satisfaction (i.e., residualized change) at follow up. This finding is consistent with a recent review of the effects of shared decision making on patient satisfaction that found a positive relationship between shared decision making and satisfaction. The authors found that shared decision making is often most effective when related to managing chronic illness vs. acute illness and when the intervention requires more than one session (Joosten, et al., 2008). In fact, the literature suggests that one of the most effective ways for improving shared decision making between doctors and patients is to simultaneously provide interventions to doctors and their patients at the same time (Légaré, et al., 2010; Légaré, et al., 2012).

There were no significant main effects of or interactions between race, gender, and concordance on patient satisfaction. This lack of a finding was not surprising given that the research literature does not support a clear association between race, gender, and patient satisfaction. Meghani, et al. (2009) concluded from their review of the literature that there was no clear pattern of findings between race and patient satisfaction. Furthermore, studies suggest that some patients are more satisfied with female physicians (Bernzweig, et al., 1997; Bertakis, et al., 1995) while other patients are more satisfied with male doctors (Ross, et al., 1982). Other studies suggest that patients are more satisfied with female doctors but by male patients only or with male doctors but by female patients only (J. Schmittdiel, et al., 2000).

In addition, there was no effect of patient education on patient satisfaction. This lack of a finding contrasts with Jensen and colleagues' (2010) study of 131 low-income adults where a

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relationship between higher levels of patient education and lower levels of patient satisfaction was found. Older, non-White, optimistic, and literacy deficient patients tended to report greater communication satisfaction than their younger, White, pessimistic, and functionally literate peers. In brief, the research literature is mixed regarding the effect of race or gender on patient satisfaction and this study found no effects for race, gender, concordance, or patient education level on patient satisfaction.

Adherence. Several patient and doctor communication variables were associated with higher levels of adherence. For example, higher levels of patient reported interpersonal affiliation, shared decision making, and the working alliance were all associated with higher levels of adherence. In addition, higher doctor rated working alliance was associated with higher levels of adherence. In brief, it appears that indicators of a good physician-patient relationship were associated higher levels of patient reported adherence. In fact, a recent meta analytic review of physician communication and patient adherence found that patients of physicians who communicate well have 19% higher adherence. In addition, communication skills programs for physicians can improve patient adherence by 12% (Haskard Zolnierek & DiMatteo, 2009). The authors postulated that the pathway between good doctor communication and patient adherence is likely due to the fact that quality communication facilitates the transmission and retrieval of crucial health information, facilitates patient involvement in decision making, allows for discussions related to barriers to adherence, and instills trust in patients. Thus, high levels of interpersonal affiliation, shared decision making, and the working alliance are all indicative of good communication between the physician and the patient.

Patient gender appeared to influence adherence as well. Male patients reported higher levels of adherence at follow up when compared to female patients. To the author's knowledge

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there do not appear to be any other physician-patient communication studies that have identified a relationship between patient gender and adherence. There does not appear to be a plausible hypothesis that would explain this finding.

African American patients reported higher levels of adherence at follow up when compared to White patients. In fact, White Female patients reported the lowest levels of adherence at follow up when compared to all other groups. Unfortunately, the few studies that have evaluated the relationship between patient characteristics such as race and gender and adherence have found mixed results. For example, Fuertes, et al. (2007) in a study of 118 patients did not find any effect for patient race or patient gender on adherence. Van Wieringen, et al. (2002) in a study of 87 parent-pediatrician interactions found that race and gender were not associated with adherence. Nguyen, et al. (2009) in a study of 253 patients with irritable bowel syndrome found that White patients were more adherent than African American patients. Overall, the findings from this study do not appear to provide further clarity to the literature regarding the interaction between race, gender, and adherence.

It should be noted that adherence was broadly assessed in the current study using a measure that did not focus on specific and measurable domains of health associated with diabetes or hypertension. For example it was not possible to ascertain if adherence behavior was related to specific behaviors in areas such as diet, physical activity, medication, or other recommendations. In addition, each of these domains of adherence are associated with a specific subset of barriers to adherence (Ingersoll & Cohen, 2008). Medication adherence, for example, is often influenced by barriers such as side effects, lack of belief in the treatment, and cost (Osterberg & Blaschke, 2005).

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Overall, findings from this study indicate that improved physician-patient communication may improve patient adherence to medical recommendations. This finding is consistent with other studies where good physician-patient communication has been associated with improved patient adherence. For example, Schoenthaler, Allegrante, Chaplin, and Ogedegbe (2012) in a study of 606 patients found that collaborative physician-patient communication was strongly associated with improved adherence by Black patients when receiving care from White physicians. In addition, several other studies have demonstrated a relationship between physician-patient communication and improved health status (e.g. lower blood pressure, better metabolic control) (Auerbach, et al., 2002; Orth, et al., 1987), mental health status (e.g., improved emotional health, reduced anxiety) (Fogarty, et al., 1999; M. A. Stewart, 1995) and patient satisfaction (Jensen, et al., 2010; Lewin, et al., 2001).

Street Jr., et al. (2009) hypothesized that good physician-patient communication can influence health outcomes by both direct and indirect pathways. In fact, several factors in addition to physician-patient communication also appear to influence patient adherence such as illness severity, patient health beliefs, and systems level issues (DiMatteo, 2004; Osterberg & Blaschke, 2005; Vermeire, Hearnshaw, Van Royen, & Denekens, 2001). Thus, future studies would benefit from identifying the specific pathway between the communication variable and the health outcome as well as measuring any proximal and intermediate variables that may influence the relationship (Street Jr., et al., 2009).

Patient education level. Patients who reported completing high school/GED reported lower levels of adherence when compared to patients in all other groups (e.g. 8th grade or less, started high school, and some college). The role of education level on this particular variable is unclear since higher levels of patient education (i.e., some college) and lower levels of patient

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education (e.g. 8th grade or less, started high school) were not significantly associated with patient reported affiliation. Thus, in this study there does not appear to be a linear relationship between patient education level and patient reported adherence.

Gender and Race Concordance.

This study found no effect of gender concordance on physician-patient communication and patient outcomes. Rodriguez, et al. (2011), detailed earlier, found that gender concordance was not a significant predictor of health related quality of life communication between doctors and patients. However, Bertakis and Azari (2012) in a study of 509 primary care patients and 105 resident physicians found that female gender concordance was associated with better patient-centered care while no effect was found for male gender concordance. Pickett-Blakely, Bleich, and Cooper (2011) in a study of 5,667 primary care patients and their physicians found that male concordance was associated with higher levels of diet/nutrition and exercise counseling provided by physicians than female concordant dyads. Thus, the literature appears to suggest that, on balance, there is no clear relationship between gender concordance and patient-provider communication or patient outcomes.

This study found only one effect for race concordance. As detailed earlier, patients in race concordant dyads (i.e., White doctors interacting with White patients) reported higher levels of interpersonal affiliation when compared to patients in race discordant dyads (i.e., White doctors interacting with African American patients, Asian doctors interacting with White patients, and Asian doctors interacting with African American patients). This finding was surprising given that White patients were viewed by doctors as being significantly less affiliative than African American patients. In addition, it is not clear why the relationship between race

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concordance and patient rated affiliation was not replicated in other patient reported dependent variables such as shared decision making or the working alliance.

It is clear that White physicians in this study proved to be particularly adept at forming a strong relationship with their patients. It has been hypothesized that a better working alliance and higher levels of shared decision making results in higher levels of patient adherence which in turn results in improved physical health and satisfaction (Street Jr., et al., 2009). For example, a supportive dialogue between the physician and patient could lead to better physical health if the conversation identified the target problem, provided the patient with an achievable treatment plan, and the patient implemented the plan. Although this race concordance finding needs to be replicated in other studies of safety net clinics, it does suggest that racial concordance for low-income white patients may be associated with improved interpersonal communication.

Recent findings from the literature suggest that race concordance may not necessarily be beneficial. First, it is important to note that racial concordance in the research literature typically refers to African American patients interacting with African American doctors. However, in this study racial concordance referred only to White patients interacting with White doctors. Jerant, Bertakis, Fenton, Tancredi, and Franks (2011) in an analysis of 22,440 patients in race concordant physician-patient dyads found a negative effect for race and gender concordance on provider communication and concluded that “concordance effects should not be presumed to be beneficial, as has often been implied.” Bleich, Simon, and Cooper (2012) in a study evaluating 2,231 visits of Black and White obese patients with their Black and White physicians did not find an effect for race concordance on weight related counseling. Rodriguez, et al. (2011) in a study of 63 patents and 34 oncologists found that race concordance was not a significant predictor of health related quality of life communication between doctors and patients. Phillips,

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Chiriboga, and Jang (2012) in a survey of 2,075 patients found that race concordance predicted patient perceptions of the interpersonal sensitivity of their healthcare providers for Hispanic/Latino patients, but not for African American, Asian American, and White patients. Overall, the finding from this study expands on the mixed results of prior race concordance studies, which suggests that there is no clear relationship between race concordance and patient-provider communication (Meghani, et al., 2009). Thus, the concept of race concordance does not appear to be a universally effective method for improving doctor-patient communication for all racial/ethnic groups as the growing number of studies with mixed findings suggests that patients in these racial groups are far too heterogeneous.

This lack of a finding is not surprising given the growing number of studies that continue to find mixed effects for the role of gender and race concordance on patient outcomes. For example, T. A. LaVeist and Carroll (2002) in a survey of 745 patients found that race concordance was associated with higher levels of satisfaction. Rodriguez, et al. (2011) in a study of 63 patients and 34 oncologists found that gender concordance and race concordance were not associated with health related communication. Strumpf (2011) in a survey of 8,600 patient visits and 661 primary care physicians found that race concordance was not an important predictor of outcomes. Jerant, et al. (2011) in a survey of 22,440 adult respondents did not find any support for a relationship between gender concordance or race concordance on patient health outcomes. In fact, he found evidence to suggest negative effects for concordance such that patients in both gender and race concordant dyads were less likely to rate provider communication highly.

Study Limitations

The primary limitation of this study is due to the context of the safety net clinic setting. This study assessed both urban and rural low-income uninsured/underinsured African American

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and White patients. In addition, doctor race findings were based on White and Asian resident physicians. Thus, findings from this study are not generalizable to settings and populations that differ significantly from those evaluated here such as clinics that treat patients with health insurance or employ African American doctors.

Second, there were not enough African American physicians to evaluate the role of African American racial concordance on the communication measures and patient outcomes. Unfortunately, this was a missed opportunity as racial concordance in many studies frequently refers to African American racial concordance. Thus, the significant finding of White racial concordance in this study is not generalizable to racial concordance findings from other studies.

Third, the use of multilevel modeling on a sample size that is considered small for this analytic technique may have limited the sensitivity of the analyses. Thus, some of the analyses performed may have been underpowered. The small cell sizes and the reduced power of the analyses may have increased the potential for type II error.

Fourth, this study primarily relied on self-report, which is not the most desirable method of data collection. Although the consultations were audio recorded for later evaluation, data from third party observers were not included in the present study. Thus, data obtained from a third observer perspective were unable to be correlated with the self-report patient and physician communication measures, which is ideal for physician-patient communication studies (Saba, et al., 2006). However, the patient population, study site, and limited resources of a non-grant funded study required that this method be used.

Fifth, adherence was assessed with a self-report measure administered by study personnel over the phone to patients. This may have led to an overestimation of adherence by patients due to recall bias and social desirability bias. Ideally, adherence would also be assessed using

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objective biological measures such as hemoglobin A1C. Although these biological outcome measures were collected, interpretability of these data was limited due to the small number of data points that fit within a clinically interpretable time frame. The biological measures did not fit within this time frame due to the extended length of time between medical visits for the majority of the patients in this study (66 days on average) due to various factors such as financial hardship or difficulty traveling to the medical center. In addition, a recent review of the patient adherence and communication literature found that third party communication assessment (independent of patients) appears to be a stronger predictor of adherence than patient-assessed communication (Haskard Zolnierek & DiMatteo, 2009).

Practice Implications and Future Research

The present study evaluated the associations between race, gender, concordance, communication, and patient outcomes in an ecologically valid manner with direct implications for the care of socially disadvantaged patients treated in safety net settings. These patients experience higher rates of chronic illness (Ayanian, et al., 2000), disease burden (Blankfield, et al., 2002; Zahran, et al., 2005), psychological distress (Bierman, et al., 2001), and behavioral risk factors such as poor diet, physical inactivity, and smoking (Blankfield, et al., 2002; Centers for Disease Control and Prevention, 2007; Lantz, et al., 2001) in addition to lower rates of adherence (Bosworth, et al., 2006; R. C. Kaplan, et al., 2004; Schneider, et al., 2004) and medical visits that frequently require more complex care (Bierman, et al., 2001; Mercer & Watt, 2007). In short, these patients overwhelm the current system of acute care focused treatment and when they receive care, it is typically of poorer quality (Derjung M. Tarn, et al., 2006; D. M. Tarn, et al., 2006). Starting in 2014, the health care system in the United Stated will experience an unprecedented influx of approximately 23 million uninsured and 17 million underinsured

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Americans due to the Affordable Care Act (Foster, 2010). In addition, an estimated 24 million Americans will remain uninsured even after ACA expansion, including undocumented persons, and these individuals are likely to use the safety net system for their care (M. H. Katz, 2011). Simply expanding access to a system of health care that has a record of inadequately treating socially disadvantaged populations will not fully address the health care needs of this population.

There are several practical applications of the findings from this study. First, training doctors, and especially Asian physicians, in cultural competency when interacting with socially disadvantaged patients may improve doctor-patient communication, which would then lead to increased patient adherence and satisfaction (Haskard Zolnierek & DiMatteo, 2009). Specific training in cultural competency may improve communication with socially disadvantaged patients (Kripalani, Bussey-Jones, Katz, & Genao, 2006). In addition, some have argued that the solution to improving the quality of the relationship between ethnic minority patients and physicians would be to provide physicians of all ethnic backgrounds with exposure to patients of diverse backgrounds rather than to solely relying on efforts to increase the number of minority providers (Coelho & Galan, 2012).

Second, physicians tend to interact differently with patients when circumstances force doctors to rely upon implicit bias such as when they are trying to manage the complex care of socially disadvantaged patient in a 15 minute visit. Thus, the use of strategies to mitigate the role of bias such as communication training for both doctors and patients may be one way to improve communication. In addition, the transition to the Patient Centered Medical Home (PCMH) model as part of the Affordable Care Act will also help to reduce physician implicit bias. Studies of the PCMH model have found that physician implicit bias is reduced due to the distributed responsibilities of a team based approach to care (Neuwirth, Schmittdiel, Tallman, & Bellows,

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2007). Patient centered models of care have been shown to improve access, increase patient satisfaction, decrease mortality, prevents hospital admissions for patients with chronic illness, lowers utilization, improves adherence, and lowers health spending(Anne C. Beal, Michelle M. Doty, Susan E. Hernandez, Katherine K. Shea, & Davis, 2007). In addition, the team-based approach of the PCMH model will provide physicians and other team members with financial reimbursement for time spent providing preventative care, chronic disease management, and more frequent visits for patients that need them(Grantmakers in Health, 2012).

Third, in addition to cultural competency, physicians should be aware of the differences involved in providing information to patients of lower educational and socioeconomic status. For example, in this study patient education level influenced doctors' perceptions of their patients to the extent that patients with higher educational levels were viewed as engaging in less shared decision making and having a poorer working alliance. Physicians behave differently with patients from a different SES and patients communicate differently with their doctor depending on their SES (Verlinde, Laender, Maesschalck, Deveugele, & Willems, 2012). Thus, it is not uncommon for socially disadvantaged patients with higher levels of education to exert more control over the relationship with the doctor and to report lower levels of satisfaction as a form of patient activism (Jensen, et al., 2010). Doctors have the distinction of being the member of the dyad who must be aware of the underlying processes that either facilitate or hinder patient engagement. Knowing how these processes are at work in each patient would allow physicians to adapt their own communication and behavior to more effectively engage patients. For example, seemingly benign interactions such as talking to a patient outside of the treatment room after the visit or eliciting patient concerns during the consultation can improve patient perceptions of physician relational communication (Shay, Dumenci, Siminoff, Flocke, & Lafata, 2012).

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Last, this study was one of only a few known to model the interdependence between doctors and patients using the One-With-Many (OWM) model for both reciprocal and nonreciprocal data (Kenny, et al., 2010). The relevance of this model and other multilevel approaches that appropriately model the nested design of most physician-patient studies is clear. Commonly used statistical procedures in physician-patient dyad research, such as ANOVA and OLS multiple regression, are no longer appropriate. This study sought to apply the OWM model to doctor-patient relationship in order to the to better understand the combined influence of race and gender on the interpersonal communication, shared decision making, and the working alliance processes at work in physician-patient dyads. In addition, this study sought to provide information about how race and gender were associated with pertinent outcome variables such as patient satisfaction, adherence, and health status. Future research should continue to use advanced statistical modeling in order to better understand the specific ways that Asian physicians communicate with socially disadvantaged patients.

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Appendix A

Measures

Italicized items are the scales contained in the forms. Female versions of the forms are presented, as pronouns were the only difference between versions.

1-MINUTE Resident Enrollment Form
- *Resident Demographics*

Patient Enrollment Form
- *Patient Demographics*
- *SF-12v2*

Patient (Female Doctor) Post-Visit Form
- *Impact Message Inventory-20-Patient*
- *Participatory Style of Physician Scale-6-Patient*
- *Physician-Patient Working Alliance-12-Patient*
- *Medical Patient Satisfaction Questionnaire – 11*
- *Group-Based Medical Mistrust Scale – 12*
- *MALAT-4 Patient*
- *Biological Variables*

3-MINUTE Resident (Female Patient) Post-Visit Form
- *Impact Message Inventory-20-Doctor*
- *Participatory Style of Physician Scale-6-Doctor*
- *Physician-Patient Working Alliance-12-Doctor*

Patient Follow-Up Form
- *SF-12v2*
- *Medical Outcomes Study – 5*
- *Medical Patient Satisfaction Questionnaire – 11*
- *Patient Biological Variables*

Medical Record Form

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1-MINUTE FORM Resident ID: ☐☐ Date: ☐☐ / ☐☐ / ☐☐

Baughn, Daniel; Influences on the physician-patient relationship in primary care.

This questionnaire is **CONFIDENTIAL**. Neither your attending nor the residency program will see your answers.

DIRECTIONS: Please answer all of the following questions by marking the circle that best fits your response. If you are unsure about how to respond to a question, please give the best answer you can and make a written comment beside your answer.

1. What is your age: ☐☐

2. What is your gender:
- O Male
- O Female

3. What is your race (please select one):
- O American Indian/Alaska Native
- O Asian
- O Black or African-American
- O Native Hawaiian or Other Pacific Islander
- O White
- O More than one race
- O Other (please specify):____

4. What is your ethnicity:
- O Hispanic or Latino
- O Not-Hispanic or Latino

5. What is your marital status:
- O Married/Partner
- O Divorced/Separated
- O Widowed
- O Single, never married
- O Other (please write in):____

6. Were you born in the United States or its territories (such as Puerto Rico, U.S. Virgin Islands, etc.)?
- O Yes, I was born in the United States or its territories
- O No, I was born outside of the United States and its territories
- O Other (please write in):____

7. How many years have you lived in the United States:
- O Less than 1 year
- O 1 year to 3 years
- O 4 years to 6 years
- O 7 years to 10 years
- O More than 10 years

➔ Please continue to the next page.

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1-MINUTE FORM

Baughn, Daniel; Influences on the physician-patient relationship in primary care.

Resident ID: ☐☐ Date: ☐☐ / ☐☐ / ☐☐

8. Are you an M.D. or a D.O.:
- O M.D. (Doctor of Medicine)
- O D.O. (Doctor of Osteopathic Medicine)
- O Other (please write in):____

9. What year are you in your residency training program:
- O Year 1
- O Year 2
- O Year 3
- O Year 4
- O Other (please write in):____

10. What is your residency training track:
- O Categorical Track
- O Combined Internal Medicine-Emergency Medicine Residency Training Program
- O Medicine Pediatrics Track
- O Preliminary Medicine Track
- O Physician-Scientist Research Training Program
- O Other (please write in):____

11. For Categorical Track residents, what is your training pathway or for PGY1 residents what do you think your training pathway will be?:
- O Generalist Pathway (career in practicing internist or in academic general internal medicine)
- O Hospitalist Pathway (career in inpatient/hospitalist positions)
- O Subspecialist Pathway (career in subspecialty medicine)
- O Women's Health Pathway (career in addressing issues of unique significance to the health of women)
- O Other (please write in):____

12. What is your yearly household total income (including partner/spousal income if applicable):
- O Less than $15,000
- O $15,000 to $24,999
- O $25,000 to 34,999
- O $35,000 to $49,999
- O $50,000 to $74,999
- O $75,000 to $99,999
- O $100,000 and over

➔ Please continue to the next page.

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13. What is the highest level of education completed by your PARENT(S)?

- O 8th grade or less
- O Started high school
- O Completed high school or GED equivalent
- O Completed one year of college
- O Completed two years of college or Associate Degree
- O Completed three years of college
- O Completed Bachelor Degree
- O Started Graduate or professional school
- O Completed Graduate or professional school
- O Other (please write in):____

14. Please estimate what your PARENT(S) yearly household total income level was while you were in medical school?

- O Less than $15,000
- O $15,000 to $24,999
- O $25,000 to 34,999
- O $35,000 to $49,999
- O $50,000 to $74,999
- O $75,000 to $99,999
- O $100,000 and over

15. Which category best reflects your current U.S. political orientation:

- O Conservative
- O Moderate
- O Liberal
- O Other (please write in):____
- O Prefer not to answer

Please return this form to Daniel Baughn.
You can contact me at (804) 503-6958 or email me at BaughnD@vcu.edu to pick up the form.

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Patient Enrollment Form Patient ID: ☐☐☐ Resident ID: ☐☐ Date: ☐☐ / ☐☐ / ☐☐

Baughn, Daniel; Influences on the physician-patient relationship in primary care.

This questionnaire is **CONFIDENTIAL**. Neither your doctor nor the attending physician will see your answers.

DIRECTIONS: Please answer all of the following questions by marking the circle that best fits your response. If you are unsure about how to respond to a question, please give the best answer you can and make a written comment beside your answer.

Hypertension
- O Yes
- O No

Diabetes
- O Yes
- O No

1. **What is your age:** ☐☐

2. **What is your gender:**
   - O Male
   - O Female

3. **What is your race (please select one):**
   - O American Indian/Alaska Native
   - O Asian
   - O Black or African-American
   - O Native Hawaiian or Other Pacific Islander
   - O White
   - O More than one race
   - O Other (please specify):____

4. **What is your ethnicity:**
   - O Hispanic or Latino
   - O Not-Hispanic or Latino

5. **What is your marital status:**
   - O Married/Partner
   - O Divorced/Separated
   - O Widowed
   - O Single, never married
   - O Other (please write in):____

6. **Were you born in the United States or its territories (such as Puerto Rico, U.S. Virgin Islands, etc.)?**
   - O Yes, I was born in the United States or its territories
   - O No, I was born outside of the United States and its territories
   - O Other (please write in):____

7. **How many years have you lived in the United States:**
   - O Less than 1 year
   - O 1 year to 3 years
   - O 4 years to 6 years
   - O 7 years to 10 years
   - O More than 10 years

➔ Please continue to the next page.

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8. What is your highest level of education:
- O 8th grade or less
- O Started high school
- O Completed high school or GED equivalent
- O Completed one year of college
- O Completed two years of college or Associate Degree
- O Completed three years of college
- O Completed Bachelor Degree
- O Started Graduate or professional school
- O Completed Graduate or professional school
- O Other (please write in):______________________________

9. What is your current work status (please select one):
- O Full-time
- O Part-time
- O Homemaker
- O Retired
- O Unemployed
- O Disabled
- O Student
- O Other (please write in):______________________________

10. What is your yearly household total income (including partner/spousal income if applicable):
- O Less than $15,000
- O $15,000 to $24,999
- O $25,000 to 34,999
- O $35,000 to $49,999
- O $50,000 to $74,999
- O $75,000 to $99,999
- O $100,000 and over

11. Approximately how many miles do you travel to get to this Primary Care Clinic from your home:
- O 0-15 miles
- O 16-30 miles
- O 31-45 miles
- O 45+ miles

12. Which category best reflects your current U.S. political orientation:
- O Conservative
- O Moderate
- O Liberal
- O Other (please write in):______________________________
- O Prefer not to answer

➔ Please continue to the next page.

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Your Health and Well-Being

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. *Thank you for completing this survey!*

For each of the following questions, please mark an ☒ in the one box that best describes your answer.

1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

2. The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
a Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	☐ 1	☐ 2	☐ 3
b Climbing several flights of stairs	☐ 1	☐ 2	☐ 3

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3. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Accomplished less than you would like	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b Were limited in the kind of work or other activities	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

4. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Accomplished less than you would like	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b Did work or other activities less carefully than usual	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

5. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

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6. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks...

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Have you felt calm and peaceful?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b Did you have a lot of energy?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c Have you felt downhearted and depressed?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

7. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Please return this form to Daniel Baughn.
You can contact me at (804) 503-6958 or email me at BaughnD@vcu.edu to pick up the form.

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FEMALE DOCTOR Baughn, Daniel; Influences on the physician-patient relationship in primary care.

DIRECTIONS: Read each item below and circle the number that best captures your impression while you were with your doctor. If an item does not make sense to you, give it your best try by circling a number and move on to the next question.

WHEN I WAS WITH MY DOCTOR… **IMI-20-Patient**

1. Not at all 2. Somewhat 3. Moderately so 4. Very much so

1. She made me feel appreciated by her. 1----2----3----4
2. She made me feel in charge. 1----2----3----4
3. She made me feel distant from her. 1----2----3----4
4. She made me feel taken charge of (like she had taken charge of me). 1----2----3----4
5. She made me feel complimented. 1----2----3----4
6. She made me feel dominant. 1----2----3----4
7. She made me feel like an intruder. 1----2----3----4
8. She made me feel that she wants to be the center of attention. 1----2----3----4
9. She made me feel welcome with her. 1----2----3----4
10. She made me feel that I want to point out her good qualities to her. 1----2----3----4
11. She made me feel forced to shoulder all the responsibility. 1----2----3----4
12. She made me feel that she wants me to put her on a pedestal. 1----2----3----4
13. She made me feel as important to her as others in her life. 1----2----3----4
14. She made me feel that she thinks I have most of the answers. 1----2----3----4
15. She made me feel that she doesn't want to get involved with me. 1----2----3----4
16. She made me feel that she thinks she is always in control of things. 1----2----3----4
17. She made me feel that I can ask her to carry her share of the load. 1----2----3----4
18. She made me feel that she sees me as superior. 1----2----3----4
19. She made me feel that she would rather be left alone. 1----2----3----4
20. She made me feel that she weighs situations in terms of what she can get out of them. 1----2----3----4

DURING OUR CONSULTATION… **PSPS-6-Patient**

1. Strongly disagree 2. Disagree somewhat 3. Am uncertain 4. Agree somewhat 5. Strongly agree

2. My doctor encouraged me to talk about any personal concerns I had regarding aspects of my care. 1----2----3----4----5
8. My doctor considered my personal goals and feelings in arriving at decisions about my care. 1----2----3----4----5
9. My doctor pressured me to accept a treatment alternative she preferred. 1----2----3----4----5
10. My doctor discussed the short-term and long-term consequences of available treatments. 1----2----3----4----5
13. My doctor discussed any uncertainties associated with alternative courses of action. 1----2----3----4----5

➔ Please continue to the next page.

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Patient Post-Visit Form Patient ID: ☐☐☐ Resident ID: ☐☐ Date: ☐☐ / ☐☐ / ☐☐

FEMALE DOCTOR Baughn, Daniel; Influences on the physician-patient relationship in primary care.

THINKING ABOUT THE TIME I SPENT WITH MY DOCTOR TODAY… **PPWA-12-Patient**

1. Strongly disagree 2. Disagree somewhat 3. Am uncertain 4. Agree somewhat 5. Strongly agree

1. My doctor and I agree about the things I need to do to help improve my health.

1----2----3----4----5

2. My doctor gives me new ways of looking at my health.

1----2----3----4----5

3. I believe that my doctor likes me.

1----2----3----4----5

4. I believe that my doctor trusts me.

1----2----3----4----5

5. I am confident in my doctor's ability to help me.

1----2----3----4----5

6. My doctor and I agree on my treatment plan.

1----2----3----4----5

7. My doctor understands all of what I am going through with my medical problem.

1----2----3----4----5

8. My doctor and I agree on what is important for me to do..

1----2----3----4----5

9. I trust my doctor.

1----2----3----4----5

10. My doctor and I have different ideas about my medical problems.

1----2----3----4----5

11. We established a good understanding of the kind of changes that would be good for me.

1----2----3----4----5

12. I believe that the way we are working to solve my medical problem(s) is correct.

1----2----3----4----5

➔ Please continue to the next page.

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Patient Post-Visit Form Patient ID: ☐☐☐ Resident ID: ☐☐ Date: ☐☐ / ☐☐ / ☐☐

FEMALE DOCTOR Baughn, Daniel; Influences on the physician-patient relationship in primary care.

DIRECTIONS: We want to know how you feel about **TODAY'S VISIT**. Think about today's visit, from the time it began until it ended. Respond to each of the following items by circling the number on the 5-point scale that best represents your opinion.

THINKING ABOUT TODAY'S VISIT WITH YOUR DOCTOR… **MPSQ-11**

1. Strongly disagree 2. Disagree somewhat 3. Am uncertain 4. Agree somewhat 5. Strongly agree

1. My doctor's care has helped me significantly. 1----2----3----4----5

2. Other people could be helped by my doctor. 1----2----3----4----5

3. I am satisfied with the quality of care provided by my doctor. 1----2----3----4----5

4. I feel comfortable with my doctor. 1----2----3----4----5

5. I will certainly continue to see this doctor for future care. 1----2----3----4----5

6. I would recommend this doctor to loved ones and friends. 1----2----3----4----5

7. I have easy access to my doctor's office. 1----2----3----4----5

8. Making an appointment with my doctor is pretty easy. 1----2----3----4----5

9. The nurses are usually friendly. 1----2----3----4----5

10. The administrative staff is usually friendly. 1----2----3----4----5

11. My doctor's office treats my medical information in a confidential manner. 1----2----3----4----5

DIRECTIONS: Respond to each of the following items by circling the number on the scale that best captures your response. This questionnaire is CONFIDENTIAL. Neither your doctor nor the attending physician will see your answers.

HOW MUCH DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS… **GBMMS-12**

1. Strongly disagree 2. Disagree somewhat 3. Am uncertain 4. Agree somewhat 5. Strongly agree

1. Doctors and health care workers sometimes hide information from patients who belong to my ethnic group.

   1----2----3----4----5

2. Doctors have the best interests of people of my ethnic group in mind.

   1----2----3----4----5

3. People of my ethnic group should not confide in doctors and health care workers because it will be used against them.

   1----2----3----4----5

4. People of my ethnic group should be suspicious of information from doctors and health care workers.

   1----2----3----4----5

5. People of my ethnic group cannot trust doctors and health care workers.

   1----2----3----4----5

➔ Please continue to the next page.

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HOW MUCH DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS… **Cont'd GBMMS**

1. Strongly disagree 2. Disagree somewhat 3. Am uncertain 4. Agree somewhat 5. Strongly agree

6. People of my ethnic group should be suspicious of modern medicine.

   1----2----3----4----5

7. Doctors and health care workers treat people of my ethnic group like ''guinea pigs.''

   1----2----3----4----5

8. People of my ethnic group receive the same medical care from doctors and health care workers as people from other groups.

   1----2----3----4----5

9. Doctors and health care workers do not take the medical complaints of people of my ethnic group seriously.

   1----2----3----4----5

10. People of my ethnic group are treated the same as people of other groups by doctors and health care workers.

    1----2----3----4----5

11. In most hospitals, people of different ethnic groups receive the same kind of care.

    1----2----3----4----5

12. I have personally been treated poorly or unfairly by doctors or health care workers because of my ethnicity.

    1----2----3----4----5

HOW MUCH DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS… **MALAT-4**

1. Strongly disagree 2. Disagree somewhat 3. Am uncertain 4. Agree somewhat 5. Strongly agree

1. In general, doctors understand my health problems better when they are the same race as me rather than a different race.

   1----2----3----4----5

2. In general, I feel more at ease when the doctor is the same race as I am.

   1----2----3----4----5

3. In general, doctors understand my health problems better when they are from the United States rather than from a different country.

   1----2----3----4----5

4. In general, I feel more at ease when the doctor is American born rather than from another country.

   1----2----3----4----5

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Thank you for your time! Please return this form to Daniel Baughn.
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VITAL SIGNS & LAB VALUES FROM MEDICAL RECORD **Medical Record**

1 What was the patient's presenting problem(s):

2 What was the date of the patient's first visit with this doctor: ☐☐ / ☐☐ / ☐☐

3 How many visits has the patient had with this doctor: ☐☐

4 How many visits has the patient had in this primary care clinic: ☐☐

	Item	Score/Measurement	Date
5p	Health Literacy Score (REALM-8)		
6p	Pain Score (1 -10, VAS);		
7p	Blood Pressure	Sys: Dys:	
8p	Height		
9p	Weight (IN LBS. or KILOGRAMS?)		
10p	A1C		
11p	Total Cholesterol Level (mg/dL)		
12p	HDL Cholesterol Level (mg/dL)		
13p	LDL Cholesterol Level (mg/dL)		
14p	Triglyceride Level (mg/dL)		
15p	Pneumovax vaccination, yes or no?		
16p	Seasonal Flu vaccination, yes or no?		

☒ Stop. You have finished the survey.

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3-MINUTE FORM Patient ID: ☐☐☐ Resident ID: ☐☐ Date: ☐☐ / ☐☐ / ☐☐

FEMALE PATIENT Baughn, Daniel; Influences on the physician-patient relationship in primary care.

DIRECTIONS: Read each item below and circle the number that best captures your impression while you were with the patient. If an item does not make sense to you, give it your best try by circling a number and move on to the next question.

WHEN I WAS WITH THE PATIENT… **IMI-20-Doctor**

1. Not at all 2. Somewhat 3. Moderately so 4. Very much so

1. She made me feel appreciated by her. 1----2----3----4
2. She made me feel in charge. 1----2----3----4
3. She made me feel distant from her. 1----2----3----4
4. She made me feel taken charge of (like she had taken charge of me). 1----2----3----4
5. She made me feel complimented. 1----2----3----4
6. She made me feel dominant. 1----2----3----4
7. She made me feel like an intruder. 1----2----3----4
8. She made me feel that she wants to be the center of attention. 1----2----3----4
9. She made me feel welcome with her. 1----2----3----4
10. She made me feel that I want to point out her good qualities to her. 1----2----3----4
11. She made me feel forced to shoulder all the responsibility. 1----2----3----4
12. She made me feel that she wants me to put her on a pedestal. 1----2----3----4
13. She made me feel as important to her as others in her life. 1----2----3----4
14. She made me feel that she thinks I have most of the answers. 1----2----3----4
15. She made me feel that she doesn't want to get involved with me. 1----2----3----4
16. She made me feel that she thinks she is always in control of things. 1----2----3----4
17. She made me feel that I can ask her to carry her share of the load. 1----2----3----4
18. She made me feel that she sees me as superior. 1----2----3----4
19. She made me feel that she would rather be left alone. 1----2----3----4
20. She made me feel that she weighs situations in terms of what she can get out of them. 1----2----3----4

WHEN I MET WITH THIS PATIENT… **PSPS-6-Doctor**

1. Strongly disagree 2. Disagree somewhat 3. Am uncertain 4. Agree somewhat 5. Strongly agree

2. I encouraged the patient to voice any personal concerns regarding aspects of her care. 1----2----3----4----5
8. I considered the patient's personal goals and feelings in arriving at decisions about her care. 1----2----3----4----5
9. I pressured her to accept a treatment alternative I preferred. 1----2----3----4----5
10. I discussed the short-term and long-term consequences of her available treatments. 1----2----3----4----5
13. I discussed any uncertainties associated with alternative courses of action. 1----2----3----4----5

➔ Please continue on the back side.

3M-Resident (Female Patient) Post-Visit Form-v1.docx

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3-MINUTE FORM Patient ID: ☐☐☐ Resident ID: ☐☐ Date: ☐☐ / ☐☐ / ☐☐

FEMALE PATIENT Baughn, Daniel; Influences on the physician-patient relationship in primary care.

THINKING ABOUT THE TIME I SPENT WITH MY PATIENT TODAY… **PPWA-12-Doctor**

1. Strongly disagree 2. Disagree somewhat 3. Am uncertain 4. Agree somewhat 5. Strongly agree

1. My patient agreed with me about the things she needs to do to help improve her health.

1----2----3----4----5

2. I gave my patient new ways of looking at her health.

1----2----3----4----5

3. I believe that my patient likes me.

1----2----3----4----5

4. I believe that my patient trusts me.

1----2----3----4----5

5. My patient is confident in my ability to help her.

1----2----3----4----5

6. My patient and I agree on the treatment plan.

1----2----3----4----5

7. I understand what my patient is going through with her medical problem.

1----2----3----4----5

8. My patient and I agree on what is important for her to do.

1----2----3----4----5

9. My patient trusts me.

1----2----3----4----5

10. My patient and I have different ideas about her medical problems.

1----2----3----4----5

11. We established a good understanding of the kind of changes that would be good for her.

1----2----3----4----5

12. I believe that the way we are working to solve her medical problem(s) is correct.

1----2----3----4----5

Thank you for your time! Please return this form to Daniel Baughn.
You can contact me at (804) 503-6958 or email me at BaughnD@vcu.edu to pick up the form.

☒ Stop. You have finished the survey.

3M-Resident (Female Patient) Post-Visit Form-v1.docx

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Patient Follow Up Form Patient ID: ☐☐☐ Resident ID: ☐☐ Date: ☐☐ / ☐☐ / ☐☐

Baughn, Daniel; Influences on the physician-patient relationship in primary care.

Your Health and Well-Being

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. *Thank you for completing this survey!*

For each of the following questions, please mark an ☒ in the one box that best describes your answer.

1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

2. The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
a Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	☐ 1	☐ 2	☐ 3
b Climbing several flights of stairs	☐ 1	☐ 2	☐ 3

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Patient Follow Up Form Patient ID: ☐☐☐ Resident ID: ☐☐ Date: ☐☐ / ☐☐ / ☐☐

Baughn, Daniel; Influences on the physician-patient relationship in primary care.

3. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Accomplished less than you would like	☐1	☐2	☐3	☐4	☐5
b Were limited in the kind of work or other activities	☐1	☐2	☐3	☐4	☐5

4. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Accomplished less than you would like	☐1	☐2	☐3	☐4	☐5
b Did work or other activities less carefully than usual	☐1	☐2	☐3	☐4	☐5

5. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
☐1	☐2	☐3	☐4	☐5

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6. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks...

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Have you felt calm and peaceful?	☐1	☐2	☐3	☐4	☐5
b Did you have a lot of energy?	☐1	☐2	☐3	☐4	☐5
c Have you felt downhearted and depressed?	☐1	☐2	☐3	☐4	☐5

7. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
☐1	☐2	☐3	☐4	☐5

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MOS-5

How often was each of the following statements true for you during the PAST 4 WEEKS?

1. I had a hard time doing what the doctor suggested I do…

- ○ 1. None of the time
- ○ 2. A little of the time
- ○ 3. Some of the time
- ○ 4. A good bit of the time
- ○ 5. Most of the time
- ○ 6. All of the time

2. I followed my doctor's suggestions exactly…

- ○ 1. None of the time
- ○ 2. A little of the time
- ○ 3. Some of the time
- ○ 4. A good bit of the time
- ○ 5. Most of the time
- ○ 6. All of the time

3. I was UN-ABLE to do what was necessary to follow my doctor's treatment plans…

- ○ 1. None of the time
- ○ 2. A little of the time
- ○ 3. Some of the time
- ○ 4. A good bit of the time
- ○ 5. Most of the time
- ○ 6. All of the time

4. I found it easy to do the things my doctor suggested I do…

- ○ 1. None of the time
- ○ 2. A little of the time
- ○ 3. Some of the time
- ○ 4. A good bit of the time
- ○ 5. Most of the time
- ○ 6. All of the time

5. Generally speaking, how often during the PAST 4 WEEKS were you able to do what the doctor told you?

- ○ 1. None of the time
- ○ 2. A little of the time
- ○ 3. Some of the time
- ○ 4. A good bit of the time
- ○ 5. Most of the time
- ○ 6. All of the time

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DIRECTIONS: We want to know how you feel about **YOUR LAST VISIT WITH YOUR DOCTOR**. Think about that visit, from the time it began until it ended. Respond to each of the following items by circling the number on the 5-point scale that best represents your opinion.

THINKING ABOUT YOUR LAST VISIT WITH YOUR DOCTOR… **MPSQ-11**

1. Strongly disagree 2. Disagree somewhat 3. Am uncertain 4. Agree somewhat 5. Strongly agree

1. My doctor's care has helped me significantly. 1----2----3----4----5
2. Other people could be helped by my doctor. 1----2----3----4----5
3. I am satisfied with the quality of care provided by my doctor. 1----2----3----4----5
4. I feel comfortable with my doctor. 1----2----3----4----5
5. I will certainly continue to see this doctor for future care. 1----2----3----4----5
6. I would recommend this doctor to loved ones and friends. 1----2----3----4----5
7. I have easy access to my doctor's office. 1----2----3----4----5
8. Making an appointment with my doctor is pretty easy. 1----2----3----4----5
9. The nurses are usually friendly. 1----2----3----4----5
10. The administrative staff is usually friendly. 1----2----3----4----5
11. My doctor's office treats my medical information in a confidential manner. 1----2----3----4----5

F/U VITAL SIGNS & LAB VALUES FROM MEDICAL RECORD **Medical Record**

	Item	Score/Measurement	Date
5f	Health Literacy Score (REALM-8)		
6f	Pain Score (1 -10, VAS);		
7f	Blood Pressure	Sys: Dys:	
8f	Height		
9f	Weight (IN LBS. or KILOGRAMS?)		
10f	A1C		
11f	Total Cholesterol Level (mg/dL)		
12f	HDL Cholesterol Level (mg/dL)		
13f	LDL Cholesterol Level (mg/dL)		
14f	Triglyceride Level (mg/dL)		
15f	Pneumovax vaccination, yes or no?		
16f	Seasonal Flu vaccination, yes or no?		

☒ Stop. You have finished the survey.

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Medical Record

Patient ID: ☐☐☐ Date Data Collected: ☐☐ / ☐☐ / ☐☐

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This form contains all of the medical record values recorded from the patient's electronic medical record for two time points. Time point one is the variable for the closest instance at or before the enrollment visit. Time point two is the variable for the next instance after the enrollment visit.

Enrollment Visit (Time Point 1)

Date of Enrollment Visit: ☐☐ / ☐☐ / ☐☐

MR1 What was the date of the patient's first visit with this doctor: ☐☐ / ☐☐ / ☐☐

MR2 How many visits has the patient had with this doctor: ☐☐ (including enrollment visit)

MR3 How many visits has the patient had in this primary care clinic: ☐☐ (including enrollment visit)

MR4 If DM, type?: ☐ Not Applicable ☐ Type 2 (NIDDM) ☐ Type 1 (IDDM)

MR5 What was the patient's presenting problem(s):

	Variable	*Value*		*Date*
MR6	Blood Pressure	Sys:	Dys:	MR6
MR7	Height (Feet & Inches)			MR7
MR8	Weight (lbs.)			MR8
MR9	Pain Score (1 -10, VAS)			MR9
MR10	Health Literacy Score (REALM-8)			MR10
MR11	Total Cholesterol Level (mg/dL)			MR11
MR12	HDL Cholesterol Level (mg/dL)			MR12
MR13	LDL Cholesterol Level (mg/dL)			MR13
MR14	Triglyceride Level (mg/dL)			MR14
MR15	Hemoglobin A1C			MR15
MR16	Pneumovax vaccination	☐ Yes	☐ No / No Record	MR16
MR17	Seasonal Flu vaccination	☐ Yes	☐ No / No Record	MR17

Next Visit (Time Point 2)

MR18 What was the date of the patient's next visit with an ACC2B doctor: ☐☐ / ☐☐ / ☐☐

MR19 The patient's next visit was with:

☐ Same Doctor

☐ **NEW** Doctor Name:________________ (record only gender and race of new MD in database)

	Variable	*Value*		*Date*
MR20	Blood Pressure	Sys:	Dys:	MR20
MR21	Weight (lbs.)			MR21
MR22	Pain Score (1 -10, VAS)			MR22
MR23	Total Cholesterol Level (mg/dL)			MR23
MR24	HDL Cholesterol Level (mg/dL)			MR24
MR25	LDL Cholesterol Level (mg/dL)			MR25
MR26	Triglyceride Level (mg/dL)			MR26
MR27	Hemoglobin A1C			MR27
MR28	Pneumovax vaccination	☐ Yes	☐ No / No Record	MR28
MR29	Seasonal Flu vaccination	☐ Yes	☐ No / No Record	MR29

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Vita

Daniel Baughn was born October 9th, 1981, in Gainesville, Florida, and is an American citizen. He graduated as valedictorian from Bronson High School, Bronson, Florida in 2000. He received his Bachelor of Science in Psychology from the University of Florida, Gainesville, Florida in 2005. He received his Master of Science from Virginia Commonwealth University, Richmond, Virginia in 2009. Mr. Baughn is currently a pre-doctoral psychology intern at Veterans Affairs Palo Alto Health Care System in the Behavioral Medicine Track. He will complete his Ph.D. in Clinical Psychology from Virginia Commonwealth University in August 2012 and will begin as a postdoctoral fellow in Primary Care Psychology at the San Francisco Veterans Affairs Medical Center in October 2012.

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