UNIVERSITY OF CALIFORNIA
RIVERSIDE

A Study of Physician-Patient Ethnic and Gender Concordance and Quality of Communication

A Dissertation submitted in partial satisfaction
of the requirements for the degree of

Doctor of Philosophy

in

Psychology

by

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August 2013

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Acknowledgments

I am thankful for the many blessings that I have received throughout my life. My parents, Jesus and Veronica Sanchez, have been the greatest blessing. Through their hard work, they made things possible that they never even dreamed of when they formed our family. Their dedication, love, and unconditional support have been the key ingredients to success and happiness in the pursuit of my life dreams. They have instilled in me the beliefs and values that have made them the admirable individuals and parents that they are and I am proud to be their daughter. I want to thank them for always being there for me and want them to know that every accomplishment in my life has been *ours*.

None of my grandparents lived to share in my joy of earning a doctoral degree, but I am sure that they would have been proud and I appreciated their love and support during my earlier years of life and studies. I am thankful for my family members, both in Mexico and in the U.S., who encouraged me to pursue my academic endeavors. I should also mention Bella, the cutest, four-legged member of my family. Her cheerfulness and company during long hours of writing, studying, and grading were much appreciated!

My close friends are family as well and their presence in my life has been a blessing as they have supported me in numerous and important ways throughout my career as a student. I want to thank Erica Camacho Diaz for the wonderful lifelong friendship that we have formed and for helping me make sure that I always keep things in perspective and maintain a positive attitude. I also want to thank Fr. Juan Corominas (may he rest in peace) for his inspiration, words of wisdom, and the spiritual guidance provided to my community at Our Lady of the Rosary Parish. Furthermore, I am grateful

for the friendship of the members of the Coro Canto de Amor. In particular, I want to thank Angel Trujillo for his constant encouragment, willingess to help (e.g., no PC, Mac, or other technological issue was ever impossible to troubleshoot), and availability to celebrate every academic milestone that I have achieved since high school graduation.

Thinking back to all of my college years, I am forever grateful for each person who has made a contribution to my education or who has enriched my life in some way. I enjoyed every aspect of my journey from Cerritos College to Cal State Long Beach to UC Riverside. I thank all of my instructors, mentors, peers, friends, and my students at each of those institutions because all of those relationships and experiences have led me to where I am today. In Cerritos College, Dr. David Young helped me realize that I could push myself to achieve more than I thought possible. He was sure that I would earn a Ph.D. and said that it was just a matter of time. I thank him for believing in me and helping me conduct my first research study. I am also grateful for the mentorship of Drs. Kimberley Duff and Darryl Beale. Dr. Duff sparked my interest in psychology and research methods and Dr. Beale made statistics enjoyable and offered me the best first job that I could have had as a teaching assistant for his introductory course.

When I transferred to Cal State Long Beach, I had the privilege to participate in the Career Opportunities in Research program (COR) and was mentored by Drs. John Jung and Chi-Ah Chun. Through their mentorship and my research training, I solidified my interest in attending graduate school and I appreciated their commitment to my success. Dr. James Amirkhan helped me develop a research program as a COR student and served as my advisor as a graduate student there. I thank him for his guidance and

assistance. My studies in the Master of Arts program in Research at Cal State Long Beach prepared me further for a doctoral program and I thank my instructors for challenging me in all of my coursework. Drs. Heike Mahler (UC San Diego) and Christine Dunkel Schetter (UC Los Angeles) also generously provided their time and expertise to train me through summer research internships and I am grateful for their support.

From the first day that I met Dr. Robin DiMatteo and her graduate students, and that I walked through the psychology department, I felt at home. UC Riverside provided me with the best program possible in the right environment for me. I want to thank Robin for accepting me as one of her graduate students and for the opportunity to work with her on such important research in the area of physician-patient communication and health disparities. She is an admirable person, researcher, and advisor. I also had a wonderful lab, hardworking research assistants, and a great group of colleagues. I am grateful for all of my research assistants and their help with various aspects of my research projects: Maura Sauls, Manasa Tirumalasetty, Antonia Salazar, Patricia Torres, Pauline Terbio, Dolores Torres, Sioneh Sarkissian, and Marie Tagayun. I want to thank my labmates Tricia Miller, Juliet Beni, and Nancy Sin for the experiences and friendship shared. I was fortunate for having had a second home at UC Riverside and for my academic family there.

Moreover, the faculty in our department are excellent. In addition to Robin, Drs. Kate Sweeny and Robert Rosenthal served on all of my committees throughout the Ph.D. program and their participation was invaluable. I thank Kate for providing relevant

feedback for my research projects from health and social psychology and methodological points of view. I thank Dr. Rosenthal for his patience in answering all of my questions about data analysis and interpretation for both my meta-analytic work and dissertation research. We spent countless hours in meetings and on the phone and he always had a smile or cheerful tone, a good sense of humor, and an incredible amount of knowledge to share with me. It was truly an honor to work with him. Last, but not least, I want to thank everyone in the psychology business office who helped our program run smoothly: Faye Harmer, Dianne Fewkes, Renee Young, Conrad Colindres, and our deparment chair, Dr. Glenn Stanley.

Dedication

Para mis queridos padres quienes pensaron que tenían poco que ofrecerme cuando llegué a sus vidas y sin embargo me han dado todo. Ni siquiera era un sueño lo que ahora es realidad y les doy las gracias de todo corazón. Le agradezco a Dios por la bendición de tenerlos en mi vida.

ABSTRACT OF THE DISSERTATION

A Study of Physician-Patient Ethnic and Gender Concordance and Quality of Communication

by

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University of California, Riverside, August 2013
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The importance of effective physician-patient communication for positive health care outcomes has been established; however, the demographic factors that may be associated with deficient physician-patient communication have lacked attention. The present research involved an analysis of 236 medical interactions and was designed to clarify the link between physician-patient ethnic and gender concordance (i.e., matching) and communication quality. It addressed the overarching research question of whether ethnicity matching and/or gender matching is necessary or beneficial for successful communication. Moreover, to tease apart the dynamics within the full scope of physician-patient communication, analyses for the various pairings of ethnicity matching and/or gender matching were conducted using composite variables derived from third-party ratings of physician behaviors in each of three channels of communication: (a) video-only with no audio, (b) full audio with no video, and (c) content-filtered audio (i.e., content of the dialogue is removed and only voice tone, pitch, tempo, etc. remain). Results from the

video-only channel demonstrated that patients who interacted with physicians of a different ethnicity experienced significantly more coldness from physicians than those who saw a physician of their same ethnicity ($F_{(1,215)}$=8.64, p=.004, r=.20). Furthermore, patients who interacted with physicians of their same ethnicity experienced significantly more withdrawal from their physicians than did patients who saw physicians of a different ethnicity ($F_{(1,216)}$=4.45, p=.036, r=.14). The full audio channel indicated that patients who interacted with physicians of their same gender experienced significantly more coldness from their physicians than did patients who saw physicians of a different gender ($F_{(1,226)}$=10.76, p=.001, r=.21). The content-filtered channel showed that coldness experienced by patients from physicians in gender-mismatched dyads was significantly greater in ethnically-matched dyads than in ethnically-mismatched dyads ($F_{(1,218)}$=4.08, p=.045, r=.14). There are differences in the manner in which physicians communicate with their patients based on their respective ethnic and/or gender matching and the channel of communication observed. Implications of the present results will be addressed.

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Chapter 1

Introduction

Several decades of research in the health services have indicated that effective communication during a physician-patient interaction is an essential component of the medical visit and is associated with high-quality health care outcomes (Roter & Hall, 1992; Stewart et al., 2000). However, the processes of care at the micro-level (i.e., the physician-patient interaction) and, specifically, the demographic factors that may be associated with deficient physician-patient communication have received limited focused attention. In particular, it is imperative to understand and provide clarity to the role of physician-patient concordance in the domains of ethnicity and gender. Research by Roter (2003) indicates that medically related communication research has predominantly studied male, Caucasian, primary care physicians during the delivery of outpatient care. In addition, very limited emphasis has been placed on the role of patients in medical communication. Moreover, little is known about the consequences of physician-patient ethnic and gender concordance (or discordance) on interpersonal dynamics (Roter, 2003).

Physician and Patient Ethnicity, Concordance, and Communication

A literature review on cultural differences in medical communication has found evidence for the differences and difficulties in communication between physicians and patients of distinct cultural and ethnic backgrounds (Schouten & Meeuwesen, 2006). Such research suggests that, with regard to psychosocial aspects of care, physicians behave less affectively when interacting with ethnic minority patients. Essentially the same occurs in terms of physicians' task-oriented verbal behavior, although such results

have been somewhat less pronounced. Furthermore, when interacting with Caucasian physicians, ethnic minority patients themselves tend to be less verbally expressive, less assertive, and less affective during a medical encounter compared to Caucasian patients. Schouten and Meeuwesen (2006) also stated that ethnic minority patients experience worse health-related outcomes, including poor satisfaction and adherence, than Caucasian patients.

According to Ashton and colleagues (2003), disparities in health services use and outcomes have been attributed to differences in access to care for ethnic minority patients compared to Caucasian patients. However, they argue that setting aside access to care issues, disparities arise as a result of what occurs during physician-patient interactions. Specifically, they suggest that phenomena including racial bias on the part of the physician may be contributing to poor communication. Based on their review of the literature discussing physician-patient communication among ethnic minority patients, they conclude that poor communication primarily impedes the development of a shared explanatory model. An explanatory model encompasses the manner in which a person makes sense of a given medical experience. It is shaped by national culture, racial and ethnic culture, gender culture, occupational and professional culture, education and knowledge, social class, religious beliefs, and personality traits. Of particular concern to this literature review is the influence of racial and ethnic culture on the development of shared explanatory models between physicians and their patients. Explanatory models are important because they drive behavior. For instance, they drive a physician's formulation of differential diagnoses and the therapeutic plan for a patient. The patient's model drives

his or her illness behavior (e.g., decision to follow recommended treatment plan). Ashton et al. (2003) conclude that poor communication is a problem for ethnic minority patients in that it undermines both the physicians' and the patients' ability to describe their own explanatory model, to respond to questions about the other's model, and to ask questions about the other's explanatory model. Consequently, ethnicity of the physician and the patient can pose barriers to the provision of appropriate medical care via communication obstacles.

The Physician-Patient Relationship and Ethnic Concordance

Saha, Arbelaez, and Cooper (2003) utilized data from The Commonwealth Fund's 2001 Health Care Quality Survey to determine whether ethnic differences in patients' satisfaction with health care and use of basic health services were explained by differences in quality of physician-patient interactions and physician-patient ethnic concordance. The study included 1,037 African American, 1,153 Hispanic, 621 Asian American, and 3,488 Caucasian respondents. Findings indicated that non-Caucasian respondents expressed lower levels of satisfaction with health care than did Caucasians (although the difference was reported as not significant for African Americans). Also, the use of health care services varied by ethnicity depending upon the health condition (e.g., African Americans received adequate blood pressure monitoring, but Hispanics with hypertension or heart disease received less routine testing and monitoring than patients of other ethnicities). In terms of the quality of physician-patient interactions, it was found that it was lower among non-Caucasian patients, especially among Hispanics and Asian Americans. Overall, the study found that physician-patient ethnic concordance,

specifically, did not play as crucial a role as is reported in other studies. Ethnic minority patients who had ethnically concordant physicians did not tend to report greater satisfaction nor greater use of health care. However, a possible limitation of the study was that respondents were asked to report on their interaction with the last physician that they saw. It is plausible that the last physician seen may not have been the patients' usual physician and yet the ethnic concordance analyses were based on interactions with those physicians.

A review of the literature conducted by Barr (2004) supports the notion that non-Caucasian patients report a lower level of satisfaction with their physician-patient interaction than Caucasian patients. Barr (2004) suggests that such a difference in satisfaction may originate from either the patients' or the physicians' approach to the interaction. First, non-Caucasian patients may approach the interaction with a physician with certain attitudes and expectations. For instance, ethnic minority patients often report a general sense of mistrust of the medical care system which may influence the type of interaction and relationship that they have with their physicians. Second, as a result of physicians' stereotypes of ethnic minority patients and unconscious attitudes toward them, physicians may treat non-Caucasian patients differently from Caucasian patients in ways that negatively affect patient satisfaction with their interaction. Thus, it is concluded that these issues are of particular concern whenever there is an ethnically discordant physician-patient encounter.

Research by Blanchard, Nayar, and Lurie (2007) indicates that, in general, patients' perceptions of health care relationships may depend on ethnic concordance with

their providers, but that there is some variation based on ethnicity. Overall, ethnic concordance between patients and their physicians was found to be significantly associated with lower rates of perceived mistreatment than discordance. Both Caucasian and Asian American patients in concordant relationships were less likely to report unfair treatment due to their ethnicity than discordant pairs. However, Hispanic patients were more likely to report being treated with disrespect in concordant provider pairings than in discordant ones. In terms of negative perceptions, Hispanic and African American patients in concordant relationships reported lower rates than Asian Americans, and Caucasian patients reported the least amount of negative perceptions across all categories examined in concordant relationships than in discordant ones. With regard to the quality of the physician-patient relationship and the extent of participatory decision making that takes place during a medical visit, Cooper-Patrick and colleagues (1999) have found that patients in ethnically concordant relationships rate their visits as more participatory than patients in discordant relationships. Furthermore, they determined that ethnic discordance even between physicians and patients who were both of ethnic minority status, produced less participatory visits (e.g., Asian American and Hispanic patients had less participatory visits with African American physicians than did African American patients). Thus, it is possible to conclude from this research that ethnic concordance may be ideal for promoting participatory decision-making between physicians and patients and that it is insufficient to pair ethnic minority patients with ethnic minority physicians of a different ethnic minority in order to promote better relationships and communication.

Physician and Patient Gender, Concordance, and Communication

Bertakis and Azari (2007) claim that physician and patient gender may influence the process of medical care and its outcomes. Their review of the literature states that differences have been documented in the manner in which physician-patient interactions vary based on whether a physician is male or female. For example, female physicians have been found to spend more time with their patients and to do more preventive screening. In terms of communication style, female physicians tend to share more information, encourage patients to talk more, have more discussion of psychosocial topics, make more supportive statements, and emphasize partnership building and participatory decision making in their interactions with patients compared to male physicians. In contrast, male physicians are more likely than female physicians to focus on biomedical aspects of illness and to make more referrals for procedures such as cardiac catheterization. As for communication style, male physicians typically spend more time on medical history taking, structuring the interaction, and on planning treatments and discussing their effects. Studies examining the differences in physician-patient interactions associated with patient gender are more limited than studies assessing physician gender. However, existing studies have reported that female patients have longer visits, ask more questions, obtain more information, receive more counseling, send and receive more emotion-based statements, utter more positive statements, and seem to be more involved in their interaction than male patients. In addition, female patients are more willing than male patients to express worry, concern, and other negative feelings (Bertakis & Azari, 2007).

According to Hall and Roter (1995), one aspect of communication in which there may not be a gender difference for patients is active patient participation. In their study, active participation was defined as asking questions, expressing concerns and negative feelings, and being assertive by stating preferences. However, it is plausible that for certain communication-related variables such as patient participation, the dynamics are more complex and may actually depend on the interplay of the gender of the physician and that of the patient (i.e., gender concordance/discordance). Although Cooper-Patrick et al. (1999) found that physician-patient gender concordance was not significantly related to participatory decision-making, other studies have found mixed evidence either in favor or against gender concordance. Kaplan and colleagues (1995) indicated that male patients who see male physicians have less participatory visits compared with male patients who see female physicians and compared with female patients who see physicians of either gender. In a recent study by Bertakis, Franks, and Epstein (2009) examining patient-centered communication in primary care, comparisons were made for gender concordant/discordant physician-patient dyads. It was found that there was no significant association between gender concordance and overall patient-centered communication. However, the amount of communication that took place in which the physician explored the patient's family, social network, job, and interests in order to attempt to 'understand the whole person' was greater among gender concordant pairs than discordant pairs. For this study, it should be noted that standardized patients were used rather than actual patients and that it is possible that this may or may not have influenced the results.

In regard to general communication aspects, a review by Roter (2003) states that female gender concordant visits are characterized by longer visit length and more equal physician and patient contributions to the medical dialogue than all other gender combinations. Also, male concordant visits are characterized by the shortest visit length and the highest level of physician verbal dominance. Hall et al. (1994) report that there are more positive statements, nodding, and back channels in female concordant visits compared to other physician-patient gender pairings. Moreover, Gross et al. (2008) claim that physician-patient gender concordance and discordance are also related to physicians' perceptions of their interactions with patients and their patients' conditions. In particular, the female concordant dyad was positively related to the physician's report of high rapport, and negatively related to uncertainty about the diagnosis. In contrast, the discordant female patient-male physician dyad was positively related to the physician's perception and report of uncertainty of diagnosis and patient's hidden agenda, and negatively related to rating the patient's condition as high in severity. These results can have implications not only for patient reports of satisfaction and trust in their physicians, but also on health outcomes because they can influence the types of medical tests ordered, the medications prescribed, and the general appropriateness of treatments provided. Unfortunately, the existing variability in the effectiveness or consequences of physician-patient gender concordance/discordance indicates that further research is needed to untangle the existing relationships between gender concordance and various types of communication behaviors exhibited by both the physicians and the patients.

Patient Preference and Physician-Patient Gender Concordance

It is necessary to note that patients may sometimes select the gender of their physician depending upon the type of health concern that they have. In general, female patients tend to select female physicians for preventive health services, including Papanicolaou testing and mammograms, and nearly four out of five patient visits to female primary care physicians are from women (Fang, McCarthy, & Singer, 2004). Similarly, male patients sometimes elect to see male physicians for certain exams, such as testicular or rectal exams (Fang, McCarthy, & Singer, 2004). However, according to Garcia et al. (2003), male patients often deny having a gender preference for their primary care provider. But, they report an inclination toward having a physician who would listen to them and try to relate, and who would show interest in them and in their health. Coincidentally, the qualities in a physician which are preferred by male patients (i.e., qualities of a good physician) are often the qualities which female physicians tend to possess. Yet, male patients are less likely than female patients to associate such qualities with a female physician (Gray, 1982; Garcia, Paterniti, Romano, & Kravitz, 2003). In theory, some researchers suggest that gender concordance between physicians and patients should be preferable, especially for female patients (Fang, McCarthy, & Singer, 2004). On the other hand, the question still exists as to whether or not gender concordance is ideal in practice (e.g., perhaps male patients may have more efficient and beneficial interactions with female physicians; Gray, 1982).

In sum, past research has typically attempted to address the role of either ethnic concordance or gender concordance in relation to the physician-patient interaction and

relationship (Berger, 2008; Sandhu et al., 2009). But, research addressing the importance of each type of concordance individually and in conjunction is lacking. Also, previous research is inconclusive with respect to whether or not ethnic and/or gender concordance is desirable and potentially conducive to positive physician-patient communication. Insight into such relationship between ethnic and gender concordance and specific indicators of physician-patient communication quality is warranted.

Chapter 2

Study Overview

The present dissertation research involved a secondary data analysis of a data set including 236 medical interactions. It attempted to address the overarching research question of whether or not, or to what degree, physician-patient similarity is related to positive communication. Specifically, does it matter whether physicians and patients are of the same ethnicity and gender, or may concordance on one demographic characteristic be useful in promoting positive communication? In order to determine what factors contribute to the overall quality of communication in the various pairings of physician-patient concordance and discordance, third party ratings of physician behaviors were assessed. Analyses for the various pairings of ethnicity and gender concordance/discordance were conducted using third party ratings for communication-related variables in each of three channels of communication (i.e., video-only with no audio, full audio with no video, and content-filtered audio). It was expected that there would be differences in the manner in which physicians communicated with their patients based on their respective ethnic and gender concordance/discordance and the channel of communication observed.

Method

The present study was an intensive, secondary data analysis of an existing data file from the Health Communication Lab at the University of California, Riverside. The digital recordings of the physician-patient interactions were obtained by Dr. John Heritage (Department of Sociology, UCLA) and are part of a larger study assessing

"Communication and Satisfaction with Primary Care Teams." The interactions were collected from community primary care medical practices which were randomly selected from three nonstaff-model health maintenance organizations located in the Southern California metropolitan area. Health care providers were recruited at each of the 34 practices that agreed to participate (both physicians and nurses were recruited, however, physician-patient interactions were the focus of the present study). Up to 10 patients were sampled from each practice. In order to participate, patients were required to be English speakers and to be visiting the office for a new medical problem. Patients consented to videotaping in the exam room and filled out pre- and post-visit questionnaires. The pre-visit questionnaire consisted of patient demographic characteristics such as age, ethnicity, education, insurance type, and income. The patients' post-visit questionnaire was an abbreviated version of the Patient Satisfaction Questionnaire-18 which was developed and validated for the RAND Medical Outcomes Study (Marshall & Hays, 1994). Subsequently, the full video with audio digital recordings were used to extract three types of communication channels via the technical manipulation of the video and audio content. The three channels created were video-only with no audio, full audio with no video, and content-filtered audio. Third party rating questionnaires were created in the Health Communication Lab in order to have raters assess communication quality indicators, including verbal and nonverbal cues and behaviors from both the physicians and the patients across the three channels. The ratings obtained for physician behaviors for the 236 physician- patient interactions (across the three channels) were the focus of the analyses in the present study.

Design

The present study assessed differences in communication quality variables based on physician-patient gender concordance versus discordance and ethnic concordance versus discordance. Thus, the study entailed a 2 x 2 factorial design as shown in Figure 1.

Characteristics of the Physicians and Patients. Table 1 describes the demographic characteristics of the physicians in this study. There were 21 female and 40 male physicians. The ethnicity breakdown for physicians was as follows: African American (6.7%), Asian American (30.0%), Caucasian (56.7%), and Hispanic (6.7%). Table 2 contains the demographic characteristics of the patients in this study. There were 148 female and 88 male patients. The ethnicity breakdown for patients was as follows: African American (7.4%), Asian American (10.9%), Caucasian (49.6%), Hispanic (28.3%), Native American (0.8%), and other ethnicity (3.0%). Table 3 includes the number of physician-patient dyads concordant/discordant on gender and/or ethnicity. A total of 50.8% of physician-patient dyads were concordant on gender and 40.9% physician-patient dyads were concordant on ethnicity.

Independent variables. The independent variables were physician and patient gender (i.e., male or female) and ethnicity (i.e., African American, Asian American, Caucasian, Hispanic, Native American, and other). Gender and ethnicity were either self-reported or coded by a trained research assistant if the information was not available from the self-report items.

Dependent variables. The dependent variables consisted of raters' perceptions of the physicians' communicative behaviors during the medical interaction (collected in the

Health Communication Lab at UCR), across the three channels of communication. The ratings were used to create the composite variables utilized in the analyses for this study and are discussed in the analyses section below.

Measures

Ratings of Physician Behaviors. Four female raters (per channel of communication) provided assessments of physician behaviors. The raters were specifically chosen to be female because past research has shown that female judges are more sensitive (particularly for nonverbal communication) than male judges (Hall, 1984; Ambady, Hallahan, & Rosenthal, 1995). Also, the raters were 'naive judges' (trained for the first time for this rating task) because their ratings tend to be the most similar to the evaluations of actual patients after a medical visit (Hall, Roter, & Rand, 1981). The training session oriented raters to the rating scales and at the start of ratings, each received a unique randomly ordered list of the interactions (for their assigned channel of communication) in order to counterbalance and prevent biases due to practice and fatigue effects. Sets of four raters assessed all 236 medical visits (i.e., one different set of raters for each of the channels of communication).

Channels of Communication. The three channels of communication are listed and described below.

1. Video-only with no audio*: This channel contains the images of the interaction only and no audio of the dialogue between physicians and patients is provided. It allows for the assessment of nonverbal cues (e.g., gestures, posture, interactional distance) provided by the physicians and the patients. The raters viewed the first five minutes of

each physician-patient interaction and provided ratings on a bipolar scale for the physicians' behaviors. The rating scale is provided in Appendix A.

2. Full audio with no video*: This channel contains only the audio portion of the interaction and provides the dialogue between physicians and patients. This channel allows for the assessment of verbal communication only (e.g., communication content, voice tone, extra-linguistic cues such as pauses and interruptions) as expressed by both parties. The raters listened to the first five minutes of the interaction and provided ratings on a bipolar scale for physician behaviors. The rating scale is provided in Appendix B. *It is necessary to note that the video-only with no audio and the full audio with no video channels are complementary and fully comparable to each other, meaning that each channel contains what the other lacks and there is no overlap of information.

3. Content-filtered audio: This channel contains only audio with the semantic content of the dialogue removed for physicians and patients. Separate content-filtered clips were made for the physicians' and the patients' voices, however, the present study only utilized the physicians' voices. The clips contain 30-second segments of the physician's voice sampled from the beginning, middle, and end of each interaction. That is, each clip has only a physician's voice, and each was sampled from the beginning, middle, and end of each interaction. The content-filtered voice of the physician was rated separately from the content-filtered voice of the patient due to the fact that with content-filtered audio, it is not possible to know which voice belongs to the physician and which to the patient. Previous research has found that brief segments of an interaction can convey a considerable amount of information, thus the present segments were created

following past research guidelines (Ambady & Rosenthal, 1992; Rosenthal et al., 1979). Each segment is a sequential stream of communication with silences and the communication of the other party removed. Overlapping conversation was handled by deleting simultaneous speech but keeping simultaneous laughter and backchannel. This content-filtered channel allows for the assessment of cues such as voice tone, pitch, tempo, and volume expressed by the physicians. This channel is important to assess because there is empirical evidence that content-filtered voice tone can predict medical care outcomes including malpractice claims, patient satisfaction, and patient adherence to treatment (DiMatteo et al., 1980; DiMatteo et al., 1986; Hall et al., 1981; Ambady et al., 2002). Raters listened to the content-filtered audio clip of each physician's voice and assessed the physician's characteristics and behaviors. The rating scale is provided in Appendix C.

Research Questions

The overarching research question for the present study was: What is the relationship between physician-patient ethnic and gender concordance/discordance and communication quality (as indicated by physician behaviors)? Each of the research questions was examined for each channel of communication.

Research Question 1. Does ethnic concordance between physicians and patients matter for communication quality? In other words, will there be a main effect of ethnic concordance on communication?

Research Question 2. Does gender concordance between physicians and patients matter for communication quality? In other words, will there be a main effect of gender concordance on communication?

Research Question 3. Will both ethnic and gender concordance or complete discordance (neither domain concordant) between physicians and patients be associated with better communication quality than concordance on only one characteristic (either ethnicity or gender only)? In other words, will there be an interaction effect of ethnic and gender concordance on communication?

Analyses

Psychometric analyses were conducted on all scale items containing physician communicative behaviors (available in Appendices A through C). Effective reliabilities of each of the individual items in the physician behavior rating scales were assessed by calculating the intercorrelations of the scores of the four raters (for each channel of communication) and applying the Spearman-Brown Formula (with the number of variables as four). Tables 4 through 6 contain the Effective Inter-rater Reliability for each of the items for the three channels of communication. Composite variables, based on the original rating scales, (one scale was used per channel of communication) were identified using a Principal Components Analysis with varimax orthogonal rotation in order to extract meaningful composite variables for further analysis. Component structure was explored and evaluated in terms of conceptual meaning and value, and allowed for the possibility of one or more composite variables. For the three channels of communication, the four or five component solution was adopted and the corresponding composite

variables were created by averaging the items within each identified component to form each composite variable (i.e., weighting by component loading was not used). The specific composite variables were created for each channel of communication as discussed below. The variables within each composite are listed in order from the highest to lowest component loadings. The precise component loadings are available in Table 7 for the video-only and full audio channels and in Table 8 for the content-filtered channel.

The video-only channel produced four composite variables: physician cold, withdrawn, facilitative, and nervous. Physician coldness included the physician behaviors of physician cold, unfriendly, does not like the patient, not likeable, not personal, and insensitive. The physician withdrawn composite included physician inactive, inefficient, submissive, and does not touch the patient a lot. The physician facilitative composite consisted of physician caring, attends to patient, interested, cooperative, and not hurried. The last composite, physician nervous, included physician nervous, uncomfortable, and incompetent.

The intra/intermatrix of mean intercorrelations for the video-only channel is available in Table 9. This matrix is valuable in that it allows for a quick, visual examination of the composites formed and provides a sense of whether or not clear, defensible composites have been formed (Rosenthal, 2005). As the mean correlations between composites are noticeably lower than the correlations within composites, the intra/intermatix indicates that the composites have been constructed well. In addition, the *r* method was utilized to quantify the degree of success in forming the composite variables. This method consists of computing the point-biserial correlation (*r*) between

the mean correlations of the intra/intermatrix and their location on the principal diagonal (coded as 1) or off the diagonal (coded as 0) of the intra/intermatrix. The resulting *r* is a composite clarity index for which the higher the positive value, the higher the intra mean correlations are, on average, than the inter mean correlations (Rosenthal & Rosnow, 2008). The composite clarity index *r* for the video-only channel composite variables is 0.728, therefore quantitatively supporting the composite variables that were created.

The full audio channel produced the same four composite variables as the video-only channel with most of the same variables loading on each component. The physician cold composite variable consisted of physician cold, unfriendly, not likable, not caring, insensitive, does not like the patient, and not personal. The physician withdrawn component included physician inactive, inefficient, submissive, and does not touch the patient a lot. Physician facilitative was comprised of physician cooperative, not hurried, and does not interrupt a patient a lot. Lastly, physician nervous included physician uncomfortable and nervous. The intra/intermatrix of mean intercorrelations for the full audio channel is available in Table 10. It shows that the mean correlations between composites are generally lower than the correlations within composites. Furthermore, the composite clarity index *r* of 0.748 indicates that the composites formed are clear and sound.

The content-filtered channel contained the majority of the variables in the scales for the other two channels and several additional variables. A total of five composite variables were produced for this channel: physician cold, withdrawn, incompetent, disrespectful, and not nervous. The exact component loadings are indicated on Table 8.

Physician coldness included physician cold, does not like the person being talked to, not likeable, unfriendly, not personal, not sympathetic, insensitive, and not caring. The physician withdrawn composite consisted of physician inactive, not assertive, submissive, unenthusiastic, disengaged, and uninterested. Physician incompetent was comprised of physician incompetent, inefficient, and unprofessional. The physician disrespectful composite included physician disrespectful, angry, condescending, and not cooperative. Lastly, physician not nervous included physician not nervous, not hurried, and comfortable. The intra/intermatrix of mean intercorrelations for the content-filtered channel is available in Table 11. The mean correlations between composites are lower than the correlations within composites and the composite clarity index *r* of 0.798 provides support for the composites formed.

Lastly, after providing quantitative justification for the composite variables created, an analysis of variance was conducted utilizing each composite variable for physician communicative behaviors as the dependent variable and ethnic and gender concordance as the independent variables. View Appendix D for a table containing an overview of the analyses discussed above.

Chapter 3

Results

All research questions were examined for each of the three channels of communication and, for purposes of clarity, results are presented by channel of communication. It is important to note that, for ease of explanation, all results are stated in terms of the experiences of the patients with their physician, however, it was not the patients who reported their experiences. Instead, the patient experiences were based on the perceptions of the raters when they viewed or listened to the physician-patient interactions. Furthermore, results are discussed in terms of physician-patient ethnic and/or gender matching to facilitate the interpretation of findings for concordant versus discordant pairings. Concordance is referred to as 'matched' and discordance as 'mismatched.'

Video-Only

The video-only channel was used to examine significant differences in communication indicators based on physician-patient matching on ethnicity and gender. Analyses produced significant differences for the communication composite variables of physician coldness and physician withdrawal.

Dependent variable: Doctor Cold Composite. A 2x2 ANOVA was conducted utilizing physician-patient ethnic and gender matching as the independent variables and the composite variable for physician coldness as the dependent variable. The means are available in Table 12 and the results summary table is provided in Table 13. There was a significant main effect of ethnicity matching showing that patients who saw physicians of

a different ethnicity than their own experienced more coldness from their physicians than patients who saw physicians of their same ethnicity, $F_{(1,215)}$=8.64, p=.004, r=.197.

Dependent variable: Doctor Withdrawn Composite. A 2x2 ANOVA was conducted utilizing physician-patient ethnic and gender matching as the independent variables and the composite variable for physician withdrawal as the dependent variable. The means are available in Table 14 and the results summary table is provided in Table 15. There was a significant main effect of ethnicity matching such that patients who saw physicians of their same ethnicity experienced more withdrawal from their physicians than patients who saw physicians of a different ethnicity, $F_{(1,216)}$=4.45, p=.036, r=.142.

Full Audio

The full audio channel was used to examine significant differences in communication indicators based on physician-patient matching on ethnicity and gender. Results indicated significant or marginally significant differences for the communication composite variables of physician coldness, physician withdrawal, and physician nervousness.

Dependent Variable: Doctor Cold Composite. A 2x2 analysis of variance (ANOVA) was conducted utilizing physician-patient ethnic and gender matching as the independent variables and the composite variable for physician coldness as the dependent variable. The means are available in Table 16 and the results summary table is provided in Table 17. There was a significant main effect of gender matching, such that patients who saw physicians of their same gender experienced more coldness from their physicians than patients who saw physicians of a different gender, $F_{(1,226)}$=10.76, p=.001,

r=.213. There was also a nearly significant gender by ethnic concordance interaction indicating that the tendency for patients to experience greater physician coldness in gender-matched than in gender-mismatched dyads was greater for ethnically-mismatched than for ethnically-matched dyads, $F_{(1,226)}$=3.39, *p*=.067, *r*=.122.

Dependent Variable: Doctor Withdrawn Composite. A 2x2 ANOVA was conducted utilizing physician-patient ethnic and gender matching as the independent variables and the composite variable for physician withdrawal as the dependent variable. The means are available in Table 18 and the results summary table is provided in Table 19. There was a marginally significant main effect of gender matching such that patients who saw physicians of their same gender experienced more withdrawal from their physicians than patients who saw physicians of a different gender, $F_{(1,226)}$=3.38, *p*=.067, *r*=.121.

Dependent variable: Doctor Nervous Composite. A 2x2 ANOVA was conducted utilizing physician-patient ethnic and gender matching as the independent variables and the composite variable for physician nervousness as the dependent variable. The means are available in Table 20 and the results summary table is provided in Table 21. There was a marginally significant main effect of ethnicity matching indicating that patients who saw physicians of a different ethnicity than their own experienced more nervousness from their physicians than patients who saw physicians of their same ethnicity, $F_{(1,226)}$=3.57, *p*=.060, *r*=.125.

Content-Filtered

The content-filtered channel was used to examine significant differences in communication indicators based on physician-patient matching on ethnicity and gender. There were significant or marginally significant differences for the communication composite variables of physician coldness and physician lack of nervousness.

Dependent variable: Doctor Cold Composite. A 2x2 ANOVA was conducted utilizing physician-patient ethnic and gender matching as the independent variables and the composite variable for physician coldness as the dependent variable. The means are available in Table 22 and the results summary table is provided in Table 23. There was a significant interaction effect of ethnicity and gender matching showing that patients with physicians who were matched only on gender or only on ethnicity experienced greater coldness from physicians than those who were matched on both gender and ethnicity or not matched on either, $F_{(1,218)}$=4.08, p=.045, r=.136.

Dependent variable: Doctor Not Nervous Composite. A 2x2 ANOVA was conducted utilizing physician-patient ethnic and gender matching as the independent variables and the composite variable for physician lack of nervousness as the dependent variable. The means are available in Table 24 and the results summary table is provided in Table 25. There was a marginally significant interaction effect of ethnicity and gender showing that patients with physicians who were matched only on gender or only on ethnicity experienced greater nervousness from physicians than those who were matched on both gender and ethnicity or not matched on either, $F_{(1,218)}$=3.51, p=.062, r=.126.

Chapter 4

Discussion

The purpose of the present study was to determine whether or not there were significant differences in physician-patient communication quality based on physician-patient similarity on the demographic characteristics of gender and ethnicity. Physicians and patients were matched on gender, ethnicity, both, or neither dimension and a series of ANOVAs were conducted utilizing the composite variables derived from physician communication behaviors across three channels of communication (i.e., video-only, full audio, and content-filtered audio). Overall, the results supported the general hypothesis that there would be differences in communication quality based on the various pairings of physician-patient gender and ethnic matching. The specific results will be discussed by channel of communication, in line with the manner in which they were presented in the results section. Both statistically significant and marginally significant results will be discussed (with the pertinent statistical values provided for each result).

Video-Only Channel. It was found that patients who saw physicians of a different ethnicity than their own experienced more coldness from their physicians than patients who saw physicians of their same ethnicity, $F_{(1,215)}=8.64$, $p=.004$, $r=.197$. It is possible that when patients interact with physicians of their same ethnicity, they may feel that the physician is capable of relating to their medical and personal experiences. Physicians may be able to fulfill such patient expectations due to their similar cultural background, therefore, exhibiting less coldness with ethnically-matched patients than with ethnically-mismatched patients. In addition, physicians' low levels of coldness with ethnically-

matched patients may contribute to the findings of previous studies that have shown that when patients interact with physicians of their same ethnicity, coders report that patients tend to experience positive affect (Cooper, Roter, Johnson, Ford, Steinwachs, et al., 2003). However, it is not certain whether the lack of physician coldness may produce patient positive affect as the relationship between these variables could be in the opposite direction (i.e., patient positive affect may lead to less physician coldness).

Analyses within the video-only channel also revealed that patients who saw physicians of their same ethnicity experienced more withdrawal from their physicians than patients who saw physicians of a different ethnicity, $F_{(1,216)}$=4.45, p=.036, r=.142. Although withdrawal seems to be a negative communication behavior, it is possible that physicians may have appeared to be more relaxed with patients of their same ethnicity than with those of a different ethnicity. The withdrawal composite variable includes physician inactivity and submissiveness. Physician nonverbal communication indicators may have come across as withdrawal as the physician may have looked calm while interacting with patients of the same ethnicity. Past research has indicated that ethnic concordance tends to be linked to physician participatory decision making which may involve some degree of submissiveness on behalf of the physician in order to foster a give-and-take interaction with patients (Cooper, Roter, Johnson, Ford, Steinwachs, et al., 2003). Therefore, physicians may have appeared withdrawn nonverbally in this channel of communication, but had raters been able to listen to the dialogue simultaneously, the content of the dialogue may have revealed that physicians were not as withdrawn as it seemed from the video-only channel.

Full Audio Channel. Results indicated that patients who saw physicians of their same gender experienced more coldness from their physicians than patients who saw physicians of a different gender, $F_{(1,226)}$=10.76, p=.001, r=.213. Patients who saw physicians of their same gender also experienced more withdrawal from their physicians than patients who saw physicians of a different gender, $F_{(1,226)}$=3.38, p=.067, r=.121. Moreover, it was found that the coldness experienced by patients from physicians in gender-matched dyads was greater in ethnically-mismatched dyads than in ethnically-matched dyads, $F_{(1,226)}$=3.39, p=.067, r=.122. When physicians interact with patients of the opposite gender, it is possible that they may need to place more effort into trying to understand their patients' experiences. On the other hand, when physicians and patients are of the same gender, they do not need to compensate for differences and may not be as agreeable as in gender-mismatched dyads because it is not deemed relevant. As a result, physicians in gender-matched dyads may appear to be more cold and withdrawn than in gender-mismatched interactions. However, when there is a match on both gender and ethnicity, less coldness is experienced from physicians. This could indicate that being matched on ethnicity may offset part of the coldness associated with the match on gender. Perhaps the commonalities due to ethnicity may seem to facilitate physician-patient communication in ways that make up for the coldness perceived in dyads that are matched on gender only.

In addition, it was found that patients who saw physicians of a different ethnicity than their own experienced more nervousness from their physicians than patients who saw physicians of their same ethnicity, $F_{(1,226)}$=3.57, p=.060, r=.125. As discussed within

the results for the video-only channel, physician-patient similarity in their cultural background may have decreased the tension or awkwardness that could be present when physicians and patients are not of the same ethnicity. If physicians feel that they have a good understanding of their patients' experiences, they may feel more comfortable when interacting with them and less nervous about their communication. In fact, in addition to physician nervousness, the composite variable also includes the physican feeling uncomfortable. Therefore, it seems reasonable to conclude that physicians may have experienced less discomfort along with less nervousness when seeing patients of their same ethnicity.

Content-Filtered Audio Channel. There was a significant interaction effect of ethnicity and gender matching showing that patients with physicians who were matched only on gender or only on ethnicity experienced greater coldness from physicians than those who were matched on both gender and ethnicity or not matched on either, $F_{(1,218)}$=4.08, p=.045, r=.136. It is possible that when patients interact with physicians who are of their same gender and ethnicity, their shared background may be advantageous and may facilitate their interaction. Similarly, despite the lack of common background in gender and ethnically-mismatched dyads, it is possible that the communication that takes place between physicians and patients in such dyads is positive if physicians attempt to compensate for their differences by expending additional effort during their interaction.

It was also found that patients with physicians who were matched only on gender or only on ethnicity experienced greater nervousness from physicians than those who

were matched on both gender and ethnicity or not matched on either, $F_{(1,218)}$=3.51, p=.062, r=.126. This finding indicates that being matched on both gender and ethnicity or not matched on either characteristic led to the perception of physicians being less nervous, more comfortable, and not hurried when interacting with their patients. A full match on gender and ethnicity should produce the most common ground between physicians and patients such that positive communication should be likely because physicians would be able to relate to the needs and experiences of their patients (Schmittdiel, Grumbach, Selby, & Quesenberry, 2000). Some previous research has indicated that when there was physician-patient ethnic matching, medical visits were typically longer than when there was an ethnic mismatch (Cooper, Roter, Johnson, Ford, Steinwachs, et al., 2003). Among female physician-female patient dyads, visit lengths tend to be the longest compared with all other gender pairings (Roter & Hall, 2004; Van Dulmen & Bensing, 2000). However, research by Tabenkin, Goodwin, Zyzanski, Stange, & Medalie, (2004) has found that male physician-male patient interactions are the longest when male health procedures and health behavior counseling takes place. Such findings are in line with the present result of physicians being less nervous, less uncomfortable, and less hurried in dyads that are matched on both gender and ethnicity. In contrast, it can be speculated that no match on either characteristic may still produce the same perception of physician-patient communication quality if perhaps the physicians attempt to compensate for the lack of commonalities with their patients by being agreeable and spending more time with them until their concerns are addressed. For all of the results in the content-filtered channel, it is of particular interest to determine what characteristics of

physician voices may be key in rater and patient perceptions of the quality of communication in the various gender and ethnic pairings. This may be a topic for future research.

Findings Across Channels of Communication. The differences in results for the communication composite variables may be due to the different ways in which physicians communicate verbally (as heard in the full audio channel) or nonverbally (as seen in the video-only and heard in the content-filtered audio channels). It may be speculated that physicians are expressing or encoding different messages with what they say versus how they behave nonverbally with patients of the same or different ethnicity and gender. It would be interesting for future research to quantitatively assess differences through the comparison of correlations between the channels of communication and through the computation of discrepancy scores between physician communication variables across the three channels of communication.

Limitations of the Present Study

First, the medical interactions were digitally recorded at community primary care medical practices which were randomly selected from three nonstaff-model health maintenance organizations. It is plausible that there may be variations in the quality of interactions and communication that takes place in other types of medical settings such as private practice, university medical centers, and in specialty care. In addition, the data set only contains information for the physicians who were willing to participate in the study and not for physicians who declined to participate. Thus, these factors should be noted as potential sources of limitation with respect to the generalizability of the results obtained.

Also, although the present study examined differences in communication ratings across three channels of communication, the channels themselves are not standardized (e.g., length of interaction viewed/heard varies by channel). The medical visit was observed for the first five minutes for the video-only with no audio and the full audio with no video channels, but only 30-second segments were used for the content-filtered audio channel. Although it would have been ideal to have all three channels of communication standardized, the constraints at the time that the study was conducted did not allow it. It is possible that the difference in the length of the segments could influence the interpretation of the behaviors rated. However, short segments of content-filtered speech are usually sufficient for adequate prediction of psychological outcomes (Ambady & Rosenthal, 1992). Nonetheless, such lack of standardization may have potentially influenced the perception of the physician-patient interactions and the ratings in ways that are difficult to assess and ascertain.

In addition, the present study only assessed physician-patient concordance in terms of gender and ethnicity. It did not examine other types of concordance/discordance on characteristics such as age, socioeconomic status, or education level, nor did it investigate the interplay amongst the demographic variables being examined and the other characteristics on which physicians and patients may be concordant/discordant.

Strengths of the Present Study

The present study intended to help disentangle the existing inconsistencies in previous findings for physician-patient ethnic and gender concordance (which had only been examined independently of each other in past studies). The data utilized allowed for

the matching of physicians and patients by ethnicity and/or gender without the need of pairing them for the actual medical visit. Furthermore, this study went beyond assessing ethnic and gender concordance/discordance individually by examining how either concordance or discordance in both demographic characteristics, concurrently, related to communication quality (across three channels of communication). Although the present findings cannot indicate in a definitive manner whether or not patients should be matched with physicians on demographic characteristics such as gender and ethnicity, they do provide insight into the complexity of assessing physician-patient communication quality. For instance, since the different channels of communication did not produce the same results, in the same direction for the communication variables examined, it may be speculated that additional research is necessary in the domain of verbal/nonverbal discrepancies. Therefore, the inconsistent results existing in the literature on gender and ethnic concordance may, in part, be due to the variability in messages expressed by physicians through verbal and nonverbal means. It would be of interest to determine whether discrepancies in physician messages are associated with gender and/or ethnic physician-patient matching. Moreover, there could be other physician and/or patient characteristics contributing to the quality of communication that takes place between physicians and their patients.

Chapter 5

Conclusion

The present study found some support for the usefulness of physician-patient matching on demographic characteristics. For instance, patients may experience less physician nervousness, less discomfort, and less hurriedness if they are matched with physicians of the same gender and ethnicity (though this was found as well for dyads that were not matched on either characteristic). However, it is important to note that patients may perceive different messages through the verbal and nonverbal communication channels if physicians are not consistent with their words and behaviors. Also, matching on both gender and ethnicity provides a somewhat unclear sense of the combined effects on communication since each demographic characteristic may be associated with its own pros and cons (as was the case between the different channels of communication).

Perhaps matching on both characteristics, one or the other, or neither may be found useful in certain practice settings. For instance, women may report feeling the most comfortable with physicians who are women of their same ethnicity when they seek medical attention for female reproduction concerns. Thus, other variables such as the type of medical condition/concern may be important for determining what characteristics are ideal for physician-patient matching. The present study serves as a starting point for future research geared toward understanding the complexity of physician-patient matching and its relationship to communication quality.

Future Directions

Future research in this area should devote attention to the analysis of discrepancy scores between different channels of communication as they pertain to ethnic and gender matching. Since the present study finds that there may be inconsistencies in the messages expressed by physicians or in the perception of such messages by patients, quantitatively examining such discrepancies, and the circumstances under which they occur, would shed light on sources of miscommunication. In addition, as communication is a two-way interaction, patient communication behaviors should also be addressed. It is quite possible that some physician behaviors may occur as a response to certain patient behaviors. For instance, for the video-only and full audio channels, raters were able to see patient behaviors or listen to patient dialogue. This creates the possibility that raters may have rated physician communication based on what patients did or said during the medical visit. This is a problem in all dyadic research on communication, including the present study. Therefore, examining how *patients* communicate with physicians when they are matched or mismatched on ethnicity and/or gender would provide an essential part of this communication puzzle.

Another research avenue worth pursuing is patient preferences for ethnic and/or gender matching. Research by Chen and colleagues (2005) on patient preferences for matching on ethnicity showed that patients were three times more likely to rate their physician as excellent when they preferred and saw a physician of the same ethnicity. Furthermore, patients who had no preference for the ethnicity of their physician rated their physician similarly regardless of concordance (Chen, Fryer, Phillips, Wilson, &

Pathman, 2005). Research by Jahng, Martin, Golin, and DiMatteo (2005) indicated that when both physicians and patients wanted to be involved during a medical interaction, and they were able to do so, positive communication took place in addition to other outcomes such as increased patient satisfaction and adherence. Thus, perhaps assessing patient preferences for gender and ethnic concordance (in general and for certain medical conditions) or preference for physicians with a particular communication style may be practical for matching physicians with patients and promoting positive communication.

This area of research is promising and can contribute significantly to comprehending the dynamics of communication in medical settings, including the interplay of verbal and nonverbal communication. Eventually, it would be ideal to conduct intervention studies in which physicians are randomized into different degrees of matching, e.g., by gender only, by ethnicity only, by both gender and ethnicity, and by neither type of matching with patients for medical visits and to assess communication quality through direct feedback provided by each individual. Understanding the benefits of physician-patient matching on demographic or other characteristics/preferences would have the practical implication of increasing the chances of positive physician-patient communication taking place and thereby promoting additional positive outcomes such as patient adherence, patient satisfaction, and improved health status.

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Figure 1. *The 2x2 Study Factorial Design*

		Gender	
		Concordant	Discordant
Ethnicity	Concordant	Physician-Patient Female-Female Male-Male Same Ethnicity	Physician-Patient Female-Male Male-Female Same Ethnicity
	Discordant	Physician-Patient Female-Female Male-Male Different Ethnicity	Physician-Patient Female-Male Male-Female Different Ethnicity

Note: N = 230-236 physician-patient interactions
Ethnicity = Caucasian, Hispanic, African American, Asian American, Native American, or Other

Table 1. *Physician Demographics*

Demographic Characteristics	n	Percentage
Gender		
Female	21	34.4
Male	40	65.6
Ethnicity*		
Hispanic	4	6.7
African American	4	6.7
Caucasian	34	56.7
Asian American	18	30.0
Native American	0	0.0
Other	0	0.0

*Ethnicity is not available for 1 physician.

Table 2. *Patient Demographics*

Demographic Characteristics	n	Percentage
Gender		
Female	148	62.7
Male	88	37.3
Ethnicity*		
Hispanic	65	28.3
African American	17	7.4
Caucasian	114	49.6
Asian American	25	10.9
Native American	2	0.8
Other	7	3.0

*Ethnicity is not available for 6 patients.

Table 3. *Physician-Patient Gender and Ethnicity Matching*

Physician-Patient Dyads	n	Percentage
Gender		
Matched	120	50.8
Mismatched	116	49.2
Ethnicity*		
Matched	94	40.9
Mismatched	136	59.1
Matched on*		
Gender only	74	32.2
Ethnicity only	49	21.3
Gender and ethnicity	46	20.0
Neither gender nor ethnicity	61	26.5

*Patient ethnicity was not available for 6 cases resulting in 230 physician-patient dyads for pairings involving ethnicity.

Table 4. *Effective* Inter-rater Reliability of Video-Only Channel Ratings (4 Raters)*

Number	Item	Inter-rater Reliability
1	Incompetent	-0.229
2	Active	0.428
3	Nervous	0.277
4	Not likeable	0.649
5	Interested	0.477
6	Uncomfortable	0.360
7	Inefficient	0.265
8	Personal	0.645
9	Not hurried	0.375
10	Unfriendly	0.697
11	Insensitive	0.444
12	Cooperative	0.241
13	Attends to patient	0.657
14	Cold	0.696
15	Caring	0.440
16	Likes the patient	0.673
17	Touches patient a lot	0.809
18	Submissive	0.361
		Mean: 0.46

* Spearman-Brown Effective Reliability Formula = $n\bar{r}/(1+(n-1)\bar{r})$

Table 5. *Effective Inter-rater Reliability of Full Audio Channel Ratings (4 Raters)*

Number	Item	Inter-rater Reliability
1	Submissive	0.500
2	Incompetent	0.333
3	Active	0.530
4	Nervous	0.357
5	Not likeable	0.606
6	Interested	0.645
7	Uncomfortable	0.140
8	Inefficient	0.227
9	Personal	0.562
10	Not hurried	0.298
11	Unfriendly	0.737
12	Insensitive	0.584
13	Cooperative	0.392
14	Cold	0.683
15	Caring	0.744
16	Likes the patient	0.709
17	A poor interviewer	0.494
18	Does not interrupt patient a lot	0.650
		Mean: 0.51

Table 6. *Effective Inter-rater Reliability of Content-Filtered Channel Ratings (4 Raters)*

Number	Item	Inter-rater Reliability
1	Incompetent	0.222
2	Active	0.378
3	Nervous	0.118
4	Not likeable	0.329
5	Interested	0.371
6	Uncomfortable	0.139
7	Inefficient	-0.090
8	Personal	0.423
9	Not hurried	0.428
10	Unfriendly	0.407
11	Insensitive	0.412
12	Cooperative	0.038
13	Cold	0.424
14	Caring	0.302
15	Submissive	0.519
16	Unprofessional	0.143
17	Not sympathetic	0.354
18	Assertive	0.507
19	Unenthusiastic	0.608
20	Not angry	0.147
21	Disrespectful	0.240
22	Engaged	0.443
23	Not condescending	-0.016
24	Likes the person being talked to	0.433
		Mean: 0.30

Table 7. *Component Loadings for Full Audio and Video-Only Channels of Communication.*

	Composite Name							
	Cold		Withdrawn		Facilitative		Nervous	
Factor:	I	I	II	III	III	II	IV	IV
Variable Name / Channel:	Full Audio	Video Only	Full Audio	Video Only	Full Audio	Video Only	Full Audio	Video Only
Submissive			.71*	.50*				
Incompetent			.57*					.55*
Active			-.79[R]*	-.92[R]*				
Nervous							.76*	.81*
Not likeable	.85*	.78*						
Interested	-.61[R]		-.57[R]*			.64*		
Uncomfortable							.77*	.73*
Inefficient			.58*	.53*				
Personal	-.69[R]*	-.73[R]*						
Not hurried					.68*			
Unfriendly	.87*	.89*						
Insensitive	.78*	.55*				-.53[R]		
Cooperative					.79*	.61*		
Cold	.91*	.91*						
Caring	-.83[R]*					.69*		
Likes the pt.	-.77[R]*	-.82[R]*						
A poor interviewer			.50*					
Does not interrupt a pt. a lot					.65*			
Attends to pt.						.67*		
Touches pt. a lot				-.46[R]*				

Note. R = Reverse Scored, Pt. = Patient. All loadings exceeding an absolute value of .45 or greater are shown. Those that contributed to the interpretation of components are indicated with an asterisk (*).

Table 8. *Component Loadings for Content-Filtered Channel of Communication.*

Variable Name		Composite Name: Cold	Withdrawn	Incompetent	Disrespectful	Not Nervous
	Factor:	I	II	III	IV	V
Incompetent				.84*		
Active			-.83[R]*			
Nervous						-.67[R]*
Not likeable		.79*		.45		
Interested		-.48[R]	-.61[R]*			
Uncomfortable			.49			-.51[R]*
Inefficient				.81*		
Personal		-.70[R]*				
Not hurried						.56*
Unfriendly		.78*				
Insensitive		.66*			.53	
Cooperative					-.45[R]*	
Cold		.84*				
Caring		-.56[R]*			-.50[R]	
Submissive			.72*	.55		
Unprofessional				.52*	.47	
Not sympathetic		.67*			.48	
Assertive			-.83[R]*			
Unenthusiastic		.57	.71*			
Not angry					-.59[R]*	
Disrespectful					.74*	
Engaged		-.51[R]	-.63[R]*			
Not condescending					-.56[R]*	
Likes the person being talked to		-.81[R]*				

Note. R = Reverse scored. All loadings exceeding an absolute value of .45 or greater are shown. Those that contributed to the interpretation of components are indicated with an asterisk (*).

Table 9. *Intra-intermatrix of Mean Intercorrelations for the Video-Only Channel Composite Variables*

	Cold	Facilitative	Withdrawn	Nervous
Cold	.703	-.481	.208	.328
Facilitative		.528	-.254	-.454
Withdrawn			.416	.378
Nervous				.676
Composite Clarity Index *r*: 0.728				

Table 10. *Intra-intermatrix of Mean Intercorrelations for the Full Audio Channel Composite Variables*

	Cold	Withdrawn	Facilitative	Nervous
Cold	.776	.410	-.365	.364
Withdrawn		.489	-.017	.270
Facilitative			.600	-.330
Nervous				.697
Composite Clarity Index *r*: 0.748				

Table 11. *Intra-intermatrix of Mean Intercorrelations for the Content-Filtered Channel Composite Variables*

	Cold	Withdrawn	Incompetent	Disrespectful	Not Nervous
Cold	.693	.387	.276	.442	.346
Withdrawn		.596	196	.027	.259
Incompetent			.618	.350	.316
Disrespectful				.531	.279
Not Nervous					.436
Composite Clarity Index *r*: 0.798					

Table 12. *Means for Composite Variable Doctor Cold for Physician-Patient Gender and Ethnically Concordant/Discordant Dyads for Video-Only Channel*

		Gender		
		Concordant	Discordant	Means
Ethnicity	Concordant	2.26	2.25	2.26
	Discordant	2.54	2.40	2.47
	Means	2.40	2.33	2.37

Table 13. *ANOVA Results Summary for Video-Only Channel with Composite Variable Doctor Cold*

Source	Sum of squares	df	Mean square	F	Sig.	Effect size *r*
Gender Concordance	.260	1	.260	.877	.350	.064
Ethnic Concordance	2.556	1	2.556	8.638	**.004**	.197
Gender Concordance by Ethnic Concordance	.192	1	.192	.650	.421	.055
Error	63.607	215	.296			

Note: **Bold** indicates statistical significance at $p \leq .05$

Table 14. *Means for Composite Variable Doctor Withdrawn for Physician-Patient Gender and Ethnically Concordant/Discordant Dyads for Video-Only Channel*

		Gender		
		Concordant	Discordant	Means
Ethnicity	Concordant	2.63	2.56	2.60
	Discordant	2.51	2.33	2.42
	Means	2.57	2.45	2.51

Table 15. *ANOVA Results Summary for Video-Only Channel with Composite Variable Doctor Withdrawn*

Source	Sum of squares	df	Mean square	F	Sig.	Effect size *r*
Gender Concordance	.768	1	.768	2.037	.155	.097
Ethnic Concordance	1.679	1	1.679	4.451	**.036**	.142
Gender Concordance by Ethnic Concordance	.145	1	.145	.385	.535	.042
Error	81.468	216	.377			

Note: **Bold** indicates statistical significance at $p \leq .05$

Table 16. *Means for Composite Variable Doctor Cold for Physician-Patient Gender and Ethnically Concordant/Discordant Dyads for Full Audio Channel*

		Gender		
		Concordant	Discordant	Means
Ethnicity	Concordant	2.31	2.20	2.26
	Discordant	2.53	2.12	2.33
	Means	2.42	2.16	2.29

Table 17. *ANOVA Results Summary for Full Audio Channel with Composite Variable Doctor Cold*

Source	Sum of squares	df	Mean square	F	Sig.	Effect size *r*
Gender Concordance	3.690	1	3.690	10.758	**.001**	.213
Ethnic Concordance	.286	1	.286	.835	.362	.061
Gender Concordance by Ethnic Concordance	1.162	1	1.162	3.387	*.067*	.122
Error	77.523	226	.343			

Note: **Bold** indicates statistical significance at $p \leq .05$; *Italics* indicate marginal significance at $.05 \leq p \leq .10$

Table 18. *Means for Composite Variable Doctor Withdrawn for Physician-Patient Gender and Ethnically Concordant/Discordant Dyads for Full Audio Channel*

		Gender		
		Concordant	Discordant	Means
Ethnicity	Concordant	2.17	2.09	2.13
	Discordant	2.22	2.09	2.16
	Means	2.20	2.09	2.15

Table 19. *ANOVA Results Summary for Full Audio Channel with Composite Variable Doctor Withdrawn*

Source	Sum of squares	df	Mean square	F	Sig.	Effect size *r*
Gender Concordance	.631	1	.631	3.383	*.067*	.121
Ethnic Concordance	.058	1	.058	.309	.579	.037
Gender Concordance by Ethnic Concordance	.038	1	.038	.202	.654	.030
Error	42.133	226	.186			

Note: *Italics* indicate marginal significance at .05≤*p*≤.10

Table 20. *Means for Composite Variable Doctor Nervous for Physician-Patient Gender and Ethnically Concordant/Discordant Dyads for Full Audio Channel*

		Gender		
		Concordant	Discordant	Means
Ethnicity	Concordant	1.75	1.74	1.75
	Discordant	1.83	1.84	1.84
	Means	1.79	1.79	1.79

Table 21. *ANOVA Results Summary for Full Audio Channel with Composite Variable Doctor Nervous*

Source	Sum of squares	df	Mean square	F	Sig.	Effect size *r*
Gender Concordance	.001	1	.001	.004	.947	.004
Ethnic Concordance	.493	1	.493	3.567	*.060*	.125
Gender Concordance by Ethnic Concordance	.007	1	.007	.048	.827	.015
Error	31.243	226	.138			

Note: *Italics* indicate marginal significance at .05≤*p*≤.10

Table 22. *Means for Composite Variable Doctor Cold for Physician-Patient Gender and Ethnically Concordant/Discordant Dyads for Content-Filtered Channel*

		Gender		
		Concordant	Discordant	Means
Ethnicity	Concordant	2.43	2.63	2.53
	Discordant	2.54	2.51	2.53
	Means	2.49	2.57	2.53

Table 23. *ANOVA Results Summary for Content-Filtered Channel with Composite Variable Doctor Cold*

Source	Sum of squares	df	Mean square	F	Sig.	Effect size *r*
Gender Concordance	.378	1	.378	1.947	.164	.094
Ethnic Concordance	.001	1	.001	.003	.955	.004
Gender Concordance by Ethnic Concordance	.793	1	.793	4.082	**.045**	.136
Error	42.364	218	.194			

Note: **Bold** indicates statistical significance at $p \leq .05$

Table 24. *Means for Composite Variable Doctor Not Nervous for Physician-Patient Gender and Ethnically Concordant/Discordant Dyads for Content-Filtered Channel*

		Gender		
		Concordant	Discordant	Means
Ethnicity	Concordant	5.00	4.94	4.97
	Discordant	4.87	5.00	4.94
	Means	4.94	4.97	4.96

Table 25. *ANOVA Results Summary for Content-Filtered Channel with Composite Variable Doctor Not Nervous*

Source	Sum of squares	df	Mean square	F	Sig.	Effect size *r*
Gender Concordance	.084	1	.084	.580	.447	.052
Ethnic Concordance	.068	1	.068	.466	.496	.046
Gender Concordance by Ethnic Concordance	.510	1	.510	3.512	*.062*	.126
Error	31.639	218	.145			

Note: *Italics* indicate marginal significance at .05≤*p*≤.10

Appendix A

Rating Scale for Physician Communicative Behaviors
Channel of Communication: Video-Only with No Audio

The Doctor is:							
Dominant	1	2	3	4	5	6	Submissive
Competent	1	2	3	4	5	6	Incompetent
Passive	1	2	3	4	5	6	Active
Relaxed	1	2	3	4	5	6	Nervous
Likeable	1	2	3	4	5	6	Not likeable
Uninterested	1	2	3	4	5	6	Interested
Comfortable	1	2	3	4	5	6	Uncomfortable
Efficient	1	2	3	4	5	6	Inefficient
Impersonal	1	2	3	4	5	6	Personal
Hurried	1	2	3	4	5	6	Not hurried
Friendly	1	2	3	4	5	6	Unfriendly
Sensitive	1	2	3	4	5	6	Insensitive
Uncooperative	1	2	3	4	5	6	Cooperative
Attends to chart	1	2	3	4	5	6	Attends to Pt
Warm	1	2	3	4	5	6	Cold
Uncaring	1	2	3	4	5	6	Caring
Dislikes the Pt	1	2	3	4	5	6	Likes the Pt
Never touches Pt	1	2	3	4	5	6	Touches Pt a lot

Note. The instructions for the raters were as follows: Watch the first 5 minutes of the interaction between the doctor and the patient. Then rate the following by circling a number on each scale according to your perception of the interaction. “Pt” refers to the patient.

Appendix B

Rating Scale for Physician Communicative Behaviors
Channel of Communication: Full Audio, No Video

The Doctor is:							
Dominant	1	2	3	4	5	6	Submissive
Competent	1	2	3	4	5	6	Incompetent
Passive	1	2	3	4	5	6	Active
Relaxed	1	2	3	4	5	6	Nervous
Likeable	1	2	3	4	5	6	Not likeable
Uninterested	1	2	3	4	5	6	Interested
Comfortable	1	2	3	4	5	6	Uncomfortable
Efficient	1	2	3	4	5	6	Inefficient
Impersonal	1	2	3	4	5	6	Personal
Hurried	1	2	3	4	5	6	Not Hurried
Friendly	1	2	3	4	5	6	Unfriendly
Sensitive	1	2	3	4	5	6	Insensitive
Uncooperative	1	2	3	4	5	6	Cooperative
Warm	1	2	3	4	5	6	Cold
Uncaring	1	2	3	4	5	6	Caring
Dislikes the Pt	1	2	3	4	5	6	Likes the Pt
A good interviewer	1	2	3	4	5	6	A poor interviewer
Interrupts a Pt a lot	1	2	3	4	5	6	Doesn't interrupt

Note. The instructions for the raters were as follows: Listen to the first 5 minutes of the interaction. Focus on the voice tone of the interactants, and the extra-linguistic cues such as stutters, pauses and interruptions. Try to get an overall impression of HOW they communicate, not the specific things they discuss. "Pt" refers to the patient.

Appendix C

Rating Scale for Physician Communicative Behaviors
Channel of Communication: Content-Filtered Audio

The Doctor is:							
Competent	1	2	3	4	5	6	Incompetent
Passive	1	2	3	4	5	6	Active
Relaxed	1	2	3	4	5	6	Nervous
Likeable	1	2	3	4	5	6	Not likeable
Uninterested	1	2	3	4	5	6	Interested
Comfortable	1	2	3	4	5	6	Uncomfortable
Efficient	1	2	3	4	5	6	Inefficient
Impersonal	1	2	3	4	5	6	Personal
Hurried	1	2	3	4	5	6	Not hurried
Friendly	1	2	3	4	5	6	Unfriendly
Sensitive	1	2	3	4	5	6	Insensitive
Uncooperative	1	2	3	4	5	6	Cooperative
Warm	1	2	3	4	5	6	Cold
Uncaring	1	2	3	4	5	6	Caring
Dominant	1	2	3	4	5	6	Submissive
Professional	1	2	3	4	5	6	Unprofessional
Sympathetic	1	2	3	4	5	6	Not sympathetic
Unassertive	1	2	3	4	5	6	Assertive
Enthusiastic	1	2	3	4	5	6	Unenthusiastic
Angry	1	2	3	4	5	6	Not Angry
Respectful	1	2	3	4	5	6	Disrespectful
Unengaged	1	2	3	4	5	6	Engaged
Condescending	1	2	3	4	5	6	Not Condescending
Dislikes the person being talked to	1	2	3	4	5	6	Likes the person being talked to

Note. The instructions for the raters were as follows: Listen to the entire content-filtered audio clip of the voice of the Doctor. Then rate the following by circling a number on each scale according to your perception of the voice tone. Try to get an overall impression, and do not try to discern the content of the communication (the specific things being said). "Pt" refers to the patient.

Appendix D

Table of Analyses Conducted for Research Questions 1 to 3

		Analyses		
Independent Variables	**Dependent Variables**	**Psychometric**	**Principal Components Analysis**	**ANOVA** 2x2
Ethnic and Gender Concordance	Channel: Video-only, no audio Physician behaviors composite variables*: Cold Withdrawn Facilitative Nervous	X	X	X
Ethnic and Gender Concordance	Channel: Full audio, no video Physician behaviors composite variables*: Cold Withdrawn Facilitative Nervous	X	X	X
Ethnic and Gender Concordance	Channel: Content-filtered audio Physician behaviors composite variables*: Cold Withdrawn Incompetent Disrespectful Not Nervous	X	X	X

* Each composite variable served as a dependent variable and was used in a separate ANOVA.