INEQUALITY IN QUALITY:

TOWARD A BETTER UNDERSTANDING OF MICRO-

MECHANISMS UNDERLYING RACIAL/ETHNIC DISPARITIES IN

AMERICAN HEALTH CARE

A DISSERTATION

SUBMITTED TO THE DEPARTMENT OF SOCIOLOGY

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DOCTOR OF PHILOSOPHY

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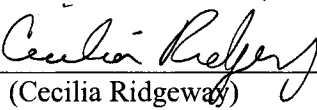
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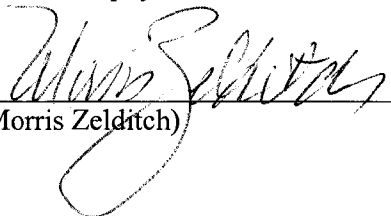
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ABSTRACT

Racial/ethnic minority patients receive poorer quality medical care when compared to White patients who have similar levels of access to health care and are comparable on a number of sociodemographic characteristics. This dissertation asks why these racial/ethnic disparities in health care exist. Using scholarship in cognitive social psychology, I develop a model of micro-level mechanisms underlying racial/ethnic interaction in health care contexts. I argue that racial/ethnic cognitions, which correspond to widely held cultural beliefs about racial/ethnic groups, are among factors contributing to poorer quality care for minority patients. These cognitions are mostly automatic, but they nevertheless shape medical decisions in ways that disadvantage minority patients, especially in healthcare contexts characterized by high stress, such as in managed care settings.

I evaluate the proposed model using survey and experimental methods. The survey study uses data from a probability sample of privately insured Americans. I find that controlling for insurance policies, characteristics of health care, and sociodemographic factors, Blacks, Hispanics, and members of other minority groups evaluate the quality of the care they received during their last visit to their primary care physician less favorably than do Whites. The adjusted differences between Whites and Hispanics interviewed in English are larger when managed care policies are used than when these policies are not used. Disparities between Whites and Hispanics interviewed in Spanish and between Whites and non-Black, non-Hispanic minority individuals are more common in managed care contexts than in other contexts.

The experimental study focuses on the role of physicians' racial/ethnic cognitions in medical decisions under varying levels of stress. I find that under high stress, physicians whose implicit cognitions about Blacks or Hispanics were activated by subliminal exposure to Black or Hispanic stimuli evaluated a hypothetical patient's condition as less serious

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compared to physicians subliminally exposed to White or neutral stimuli. Similar effects were not obtained under low stress or for explicit cognitions. Taken together, the two studies suggest that implicit (but not explicit) cognitions may contribute to racial/ethnic disparities in health care, especially in stressful contexts, and that stress-inducing managed care cost-containment policies may exacerbate racial/ethnic disparities.

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CHAPTER 1

INTRODUCTION

Beginning in 1932 in Macon County, Alabama, 600 Black men, including 399 syphilis sufferers, signed up with the U.S. Public Health Service for free medical care. Without their knowledge, they were to become the subjects in the "Tuskegee Study of Untreated Syphilis in the Negro Male." Their disease was neither disclosed to the syphilis sufferers nor treated until 1972, twenty-seven years after penicillin became the treatment of choice for syphilis. During the course of the study, more than a hundred men died of syphilis or of syphilis-related complications, at least forty wives had been infected, and nineteen children had contracted the disease at birth (Centers for Disease Control and Prevention 2004).

The Tuskegee Study became a cautionary tale of racism in American medicine. Accounts of the Tuskegee study often imply that such a blatant denial of effective medical treatment to minority patients is a thing of the past. Yet, we know that many minority patients treated across America today are receiving a significantly poorer quality of medical care services than are White patients who have similar illnesses and similar levels of access to health care, are from similar socioeconomic and geographic backgrounds, and are comparable on a number of other characteristics. Even though the body of evidence on the disadvantages that racial/ethnic minority patients face in American healthcare system is growing (see Chapter 2 for a review), the understanding of the causes of racial/ethnic differences in the quality of health care is limited.

The questions motivating this dissertation are why racial/ethnic disparities in health care exist and how are they sustained. The major goal of this dissertation is to propose a partial answer that draws on the recent scholarship in cognitive social psychology and racial/ethnic relations. I formulate a theoretical model of micro-level mechanisms contributing to

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racial/ethnic disparities in medical care and evaluate it the empirical part of my dissertation using a combination of survey and experimental methods. This model explains how patients' racial/ethnic statuses affect physicians' cognitive processes and how these processes affect physicians' behavior toward patients. I argue that physicians' social cognition about race/ethnicity shape interactions with their patients and may lead in some instances to poorer quality of services for racial/ethnic minority patients.

I focus in this study especially on such racial/ethnic differences in the quality of health care that remain after other known factors influencing the quality of care have been controlled. According to the Institute of Medicine (IOM) "racial and ethnic differences in the quality of health care that are not due to access-related factors or clinical needs, preferences and appropriateness of intervention" qualify as *racial/ethnic disparities in health care* (Smedley, Stith, and Nelson 2003, p. 4). Patient preferences are "patients' choices regarding healthcare that are based on the full and accurate understanding of treatment options" (Smedley, Stith, and Nelson 2003, p. 31). Quality of health care is "the degree to which health services… increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Smedley, Stith, and Nelson 2003, p. 26). Finally, health services are defined as "the provision of preventive, rehabilitative and/or therapeutic medical or health services to individuals or populations" (Smedley, Stith, and Nelson 2003, p. 27).

Racial/ethnic disparities in health care represent a serious social problem, not only because of their implications for social justice, but also, and perhaps even more importantly, because of the potential consequences for minority populations, such as higher rates of morbidity and mortality. Racial/ethnic disparities in health have been amply documented. According to Gary Sandefur and his co-authors (2001), life expectancy for people born in 1990 was 76 years for Whites, 75 years for Asians, 74 years for Native Americans and 69 years for Blacks. In 1995, infant mortality per 1,000 live births was 5.3 for Asians, 6.3 for Whites, 9.0

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for American Indians, and 15.1 for Blacks. Thomas LaViest and his co-authors (2000) proposed a term "excess deaths" to refer to the difference between the actual number of deaths within a minority group and the expected number of deaths if the mortality rate for that group were equal to Whites' mortality rate. They calculated that in 1997, Blacks 25-44 years old had 2,445 excess deaths due to heart disease, 4,750 excess deaths dues to HIV infection, and 1,366 excess deaths due to cancer.

Studying the quality of health care is important since poor health care may be among the causes for poor minority health. The stigma of inferiority may affect the ways in which racial/ethnic minority individuals are treated in the healthcare system. Empirical evidence supporting the argument that healthcare disparities contribute to health disparities is accumulating. Examples are studies showing that higher death rates and poorer survival rates among minority patients are related to racial disparities in the receipt of coronary revascularization (Peterson et al. 1997), poorer quality of HIV care (Bennett et al. 1995) and poorer care for cancer (Bach et al. 1999).[1]

Socio-Political Context

Racial/ethnic disparities in health care have recently received political attention. The Minority Health and Health Disparities Research and Education Act, signed into law on November 22, 2000, created a National Center on Minority Health and Health Disparities at the National Institutes of Health. The Act authorized the Agency for Healthcare Research and Quality (AHRQ) and Health Resources and Services Administration to conduct and support research on racial/ethnic disparities. Moreover, government and private sponsors have funded

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[1] Some scholars, however, contend that factors beyond medical care are equally or even more important determinants of health. Jim House (2001, p. 523) maintains that "racial-ethnic disparities in health are important because they are *large, persistent,* and even *increasing* in the United States... and do not seem to be primarily or even substantially due to inequalities in access to medical care." House argues that socioeconomic status is the primary determinant of health, and that it mediates the effects of race/ethnicity on health outcomes.

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numerous intervention projects that seek to improve health care for minority patients. AHRQ alone has supported nearly 200 grants and contracts with the goal of identifying and evaluating the effectiveness of strategies for reducing racial/ethnic disparities in health care. Other organizations that joined in the effort to eliminate disparities include the Henry J. Kaiser Family Foundation (KFF), the Robert Wood Johnson Foundation (RWJF), the American Medical Association, the American Public Health Association, the Association of American Medical Colleges, the American Academy of Family Physicians, and the American College of Physicians/American Society of Internal Medicine, among others. Many such initiatives have taken a comprehensive approach, educating healthcare providers as well as healthcare administrators and patients.

An example is an extensive initiative by KFF and RWJF, co-sponsored by several professional, academic, and healthcare organizations, which placed an advertisement in several leading cardiology journals, including *JAMA*, *Today in Cardiology*, and *The Journal of the American College of Cardiology and Circulation*. It displayed photographs of four women of different racial/ethnic backgrounds, stating: "These patients have the same condition, but their treatment may be different. Help Understand Why." Readers were directed to a website that appeals to physicians to take an active part in eliminating disparities:

> "Physicians have a key role to play in addressing disparities in medical care. As a first step in what ultimately must be a multifaceted effort, the Henry J. Kaiser Family Foundation and The Robert Wood Johnson Foundation have undertaken this initiative to raise physician awareness about disparities in medical care, beginning with cardiac care" (http://www.kff.org/whythedifference).

Among educational resources included on the KFF website is a review of studies published over the past two decades that document racial/ethnic differences in medical care for heart conditions, prepared by KFF and The American College of Cardiology Foundation, which concludes that "the strongest studies provide credible evidence that African Americans are less likely than whites to receive diagnostic procedures, revascularization procedures and

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thrombolytic therapy, even when patient characteristics are similar." The website also includes archives of news and events relevant to the issues in health care for vulnerable populations, links to editorials and articles in scientific journals, and a speaker kit for physicians interested in leading local discussions. Finally, the website provides an opportunity for the physicians to submit their thoughts on the reasons why racial/ethnic disparities in cardiac care exist and how they can be eliminated.

Yet, despite this and similar national and local initiatives, the racial/ethnic gaps in the quality of health care have not narrowed and may even be widening in some cases. A study of services provided for Medicare fee-for-service enrollees (Jha et al. 2005) documents this trend. Between 1992 and 2001, racial/ethnic disparities persisted in the receipt of potentially life-saving surgeries, including appendectomy, abdominal aortic aneurism repair, coronary artery bypass surgery, coronary angioplasty, cardiac valve replacement, carotid endarterectomy (a type of back surgery), total hip replacement, and total knee replacement. Importantly, the racial/ethnic gaps *increased* significantly for five of these procedures, including carotid endarterectomy, hip replacement, knee replacement, cardiac valve replacement, and appendectomy.

Why have the local and national initiatives been unsuccessful in narrowing racial/ethnic gaps in the quality of health care? One potential reason is that information concerning racial/ethnic disparities in the quality of care, especially if it implies physicians' contributions, may be falling on deaf ears among physician audiences. Michelle Van Ryn (2002) points out that racial/ethnic discrimination is incongruent with medical ethics and with the historical commitment of the medical profession to the principles of fairness, equity, and distributive justice. Healthcare providers want to believe they offer the same quality of care to all patients (Thrall and Friedman 2003). They may find racism repulsive and may be unwilling to entertain the idea that racial bias systematically affects medical decision-making. Some physicians find

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confronting their own individual-level contributions to racial disparities "painful" (Van Ryn and Fu 2003). The research implying racism has raised skepticism among healthcare professionals, who react in disbelief or take offense (Van Ryn 2002). Therefore, it is not surprising that many healthcare scholars and policy makers tend to adopt the strategy of understating the individual healthcare providers' contributions (Byrd 1990), and concentrate instead on socioeconomic and access-related factors in racial/ethnic disparities (see, for instance, Dupree 2002, Williams and Rucker 2002).

Moreover, there are potent political countercurrents to the efforts to duly document and, eventually, to ameliorate racial/ethnic disparities in health care. One example is the controversy over the contents of the executive summary of the "National Healthcare Disparities Report", a major scientific study written in response to Public Law 106-109 and released on December 23, 2003 by The Department of Health and Human Services. Before the release, revisions downplaying the severity and extent of racial/ethnic disparities in health care were made to the executive summary. The revised version eliminated most uses of the word "disparities", replacing it with "differences"; eliminated the conclusion that disparities are a national problem as well as evidence on the social costs of disparities, including needless disability, lost productivity and premature death; and omitted key examples of disparities, such as the higher likelihood that minorities receive sub-optimal care for a heart attack or are subjected to physical restraints in nursing homes. Instead, the executive summary highlighted milder disparities, such as differences in the likelihood of getting one's cholesterol checked. In the press release issued on January 13, 2004 by the Special Investigations Divisions of the minority staff of the Committee on Government Reform, Rep. Dale E. Kildee, Democratic Co-Chair of the Native American Caucus, criticized the political reasons behind these alterations, stating that "the Bush administration would rather ignore and conceal the disparities that exist within our healthcare system instead of confronting the problem and providing real solutions"

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(www.politicsandscience.org). On February 11, 2004, The Department of Health and Human Services' Secretary Thompson admitted that the Department was wrong to revise the scientific conclusions of the report, stating that "there was a mistake made, and it is going to be rectified" (www.politicsandscience.org).

I argue that another, potentially important, reason for the failure of many initiatives to narrow the racial/ethnic gaps in the quality of care is that we don't sufficiently understand exactly which factors contribute to racial/ethnic disparities. While the body of evidence on racial and ethnic disparities in medical care has been growing, little is known about why these differences exist and how they are sustained. Without such an understanding, it is impossible to design effective programs stemming the causes of these disparities. This dissertation contends that understanding is especially incomplete in two areas: (1) micro-level mechanisms contributing to disparities, and (2) contextual factors, such as the organization of health care, that potentially attenuate or exacerbate disparities in the quality of health care.

Conceptualizing Race/Ethnicity

Before embarking on the study of the issues of racial/ethnic relations and inequalities, it is important to conceptually engage terms such as "race", "ethnicity", "racial/ethnic group," and "minority group." These terms lack consensual definitions. In fact, how one should understand these terms has been long contested by social and natural scientists coming from various theoretical traditions. For the sake of clarity, I specify here the meanings attached to these terms in this dissertation.

Race/Ethnicity. I understand race/ethnicity as historically contingent social construction (Bobo and Fox 2003). In the social sciences, such an understanding is more common than one based on biological differences alone. According to Larry Bobo and Cybelle Fox (2003, p. 309), "although [ethno-racial] categorization may invoke consideration of physical and biological markers such as hair texture, skin tone and color, and other observable markers

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neither these indicia nor deep primordial imperatives give ethno-racial categories their social significance." In fact, recent research on the human genome has provided convincing evidence that racial/ethnic categories do not map neatly onto the human genetic variation, and that that the biological diversity within each category much exceeds the diversity among categories (Rosenberg et al. 2002).

Yet, despite the fact that race/ethnicity does not have any significant biological meaning, it is often *perceived* as having one. In an essay titled "The Changing Meaning of Race" Michael Omi (2001, p. 243) explains:

> "Biologists, genetists, and physical anthropologists, among others, long ago reached a common understanding that race is not a "scientific" concept rooted in discernible biological differences. Nevertheless, race is commonly and popularly defined in terms of skin color, hair texture, and other physical attributes, often perceived as surface manifestations of deeper, underlying differences in intelligence, temperament, physical prowess, and sexuality. Thus, although race may have no biological meaning, as used in reference to human differences, it is extremely important and highly contested *social* one."

Similarly, Larry Bobo (2001, p. 267) contends that race is commonly associated with "biologically based differences between human groups, differences typically observable in skin color, hair texture, eye shape, and other physical attributes". In contrast, "ethnicity" pertains to culture, language, religion, and nationality. It is important to acknowledge these commonly observed correlates of race/ethnicity, since physicians and patients who are interacting with each other will rely precisely on these correlates to categorize their interaction partners as belonging to concrete racial/ethnic groups. This dissertation explores the effects of such categorization on social interaction, and on the healthcare outcomes for patients.

Racial/Ethnic Groups. I adopt definitions of racial/ethnic groups specified by the United States Office of Management and Budget (OMB) and used in Census 2000. According to "Census 2000 Brief: Race and Hispanic Origin", there are five main racial categories. They are defined as follows (Grieco and Cassidy 2001, p. 2, italics added):

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"White or Caucasian refers to people having origins in any of the original peoples of Europe, the Middle East, or North Africa.

Black or African American refers to people having origins in any of the Black racial groups of Africa.

American Indian and Alaska Native refer to people having origins in any of the original peoples of North and South America (including Central America), and who maintain tribal affiliation or community attachment.

Asian refers to people having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent.

Native Hawaiian and Other Pacific Islander refers to people having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands."

The United States OMB further distinguishes between Hispanic/Latino origin and other origin. *Hispanic/Latino* is defined as "a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race" (Grieco and Cassidy 2001, p. 2).

Minority groups are defined not only in terms of numbers, but also, and especially, in terms of power and access to economic and social resources. As early as 1945, Louis Wirth defined a minority group in these terms as "a group of people who, because of their physical or cultural characteristics, are singled out from others in the society in which they live for differential and unequal treatment and who therefore regard themselves as objects of collective discrimination" (p. 347). In American society, racial/ethnic minority groups are synonymous with non-White racial/ethnic groups.

It is important to acknowledge that the use of discrete racial/ethnic categories, such as those specified by Census 2000, is problematic. Critics have pointed out the conceptual vagueness and logical flaws of the OMB racial/ethnic classification. Michael Omi (2001), for instance, argues that "some of the categories are racial, some are cultural, and some are geographic. Some groups cannot neatly be assigned to any category. In addition, little attention is given to the gaps between state definitions and polar consciousness" (p. 254). Omi notices

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that since the meanings of racial/ethnic categories are shifting, state definitions may not be meaningful to the very groups they are supposed to represent.

In addition, the classification has been criticized for its potential to reinforce the biological explanations of racial/ethnic differences and to obscure important variation within each category. The category "Asian," for instance, includes tremendous heterogeneity of original cultures, languages, and physical characteristics. For Michael Omi (2001), heterogeneity within racial/ethnic categories is one of the defining trends in current demographic change and racial transformation in America. Another trend that Omi specifies is hybridity, i.e., the growth in mixed-race people, who do not fit neatly into a single racial/ethnic category. These trends further problematize the use of traditional discrete racial/ethnic categories.

Nevertheless, racial/ethnic categories, such as those proposed by the OMB, have been widely used in research in the medical and social sciences and have proven useful in thinking about the social consequences of race/ethnicity. Indeed, federal funding agencies tend to require the use of Census categories, thereby reinforcing reliance on these categories in the scientific community. For reasons of comparability and consistency with other scholars' work, I use Census 2000 categories in this dissertation. At the same time, I use these categories critically as socially constructed, imperfect analytical tools that may in fact encompass individuals with widely varied backgrounds and experiences.

Theoretical Contributions

The development of a model of micro-level mechanisms contributing to racial/ethnic disparities in medical care is a theoretical undertaking novel in sociology. The discipline has paid limited attention to the role of race/ethnicity in health care, concentrating instead on racial/ethnic and socioeconomic inequalities in health status, with scholars such as Jim House and David Williams at the forefront of these research efforts. Scholarship in medical sociology

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suggests that differences in the quality of health care are among the reasons why minority populations suffer a disproportionate burden of disease and death. Yet, there are no comprehensive sociological models concerning how racial/ethnic disparities in medical care emerge and are sustained.

One specific goal of this study is to incorporate into these model contextual factors, namely some of the organizational characteristics of care. I seek to specify how contextual factors influence the magnitudes of the racial/ethnic differences in the quality of care. By explicitly including context, the proposed model spans micro- and meso-levels of analysis. It builds bridges between the literatures on individual cognition and on the organization of health care that have previously been largely disparate precisely because of the different levels of analysis grounding them.

Additionally, explicit incorporation of race/ethnicity into a socio-psychological model proposed in this dissertation is important because, in the opinion of some scholars, recent work in social psychology has paid limited attention to race/ethnicity. Mathew Hunt and his co-authors (2000) performed a content analysis of papers published in Social Psychology Quarterly during the last three decades and of two important sourcebooks for social psychology, "Social Psychology: Sociological Perspectives" (Rosenberg and Turner 1981) and "Sociological Perspectives on Social Psychology" (Cook, House, and Fine 1995).[2] They found that in a number of studies, race/ethnicity has been either overlooked altogether or given only nominal attention. In contrast, other dimensions of social stratification, notably gender, have been a focus of vigorous intellectual and empirical activity in social psychology. Hunt and his co-authors urge social psychologists to incorporate race/ethnicity more fully into their scholarship. My dissertation responds to this call by applying socio-psychological

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[2] In the Preface to "Sociological Perspectives on Social Psychology", the editors note that they invited a chapter on race/ethnicity, but the author did not complete it in time for publication.

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understanding to the role race/ethnicity in interpersonal interactions between physicians and their patients.

Empirical and Methodological Contributions

This dissertation brings empirical evidence on the nation-wide patterns of racial/ethnic inequalities in the quality of health care, as evaluated by patients. It assesses whether these patterns vary by organizational contexts of care characterized by the presence or absence of several types of managed care insurance policies. In addition, this dissertation empirically evaluates whether racial/ethnic cognitions influence physicians' diagnostic decisions in ways that may contribute to poorer quality care for minority patients. An important empirical contribution is distinguishing between the effects of implicit and explicit racial/ethnic cognitions on the quality of medical care, and evaluating whether the effects of these cognitions vary by the levels of physicians' stress. Moreover, this dissertation introduces a methodological innovation: an internet-based method suitable for evaluating the effects of experimentally activated implicit racial/ethnic cognitions.

Organization of the Dissertation

The dissertation proceeds as follows. In Chapter 2, I briefly review evidence on racial/ethnic differences in the quality of health care. This evidence leaves little doubt about the existence of a real disadvantage that minority individuals, especially Blacks, Hispanics, and Native Americans, face in the American healthcare system. This disadvantage in the quality of health care often persists even when factors such as socioeconomic status, age, the severity of illnesses, the presence and type of health insurance, the type of facility where health care is delivered, and geographic location are held constant. I also review the current understanding of the potential causes of racial/ethnic disparities in health care and discuss the theoretical and empirical limitations of this understanding.

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In Chapter 3, I outline the theoretical underpinnings of my conceptual model. I review scholarship on social cognition and consider how it pertains to interracial interaction. I concentrate on literature showing that (a) racial/ethnic cognitions, including racial/ethnic categorization, stereotypes and prejudice, are cognitively efficient; (b) cognitive load increases the likelihood that racial/ethnic cognition will be activated and used in behavior; and (c) racial/ethnic cognitions are, to a large degree, automatic. Building on this evidence, I propose a model of the micro-level mechanism involved in racial/ethnic interaction, which stresses the role of (largely automatic) cognitive processes attached to particular racial/ethnic categories. The models explains how these cognitive processes affect behavior of the interaction partners in ways that disadvantage the members of minority groups, as argued by expectation states theory (Ridgeway and Berger 1986, Ridgeway 1997, Ridgeway and Correll 2000). The model also addresses how the demands on the perceiver's cognitive resources affect the likelihood that the perceiver's racial/ethnic cognitions will give rise to negative behavior toward members of minority racial/ethnic groups.

The goal of Chapter 4 is to explore the application of this conceptual model to physician-patient encounters in concrete healthcare settings. I argue that such an application can help understand some mechanisms contributing to a lower quality of health care for patients of minority racial/ethnic backgrounds. I identify some concrete contextual factors that may increase the role of cognitive biases in clinical decision making, contending that among them are factors linked to the elevated levels of physicians' stress, such as cost-containment strategies used by some managed care plans. In the conclusion of this chapter, I summarize the model of racial/ethnic interaction in healthcare contexts and use it to derive general hypotheses.

In the empirical part of my dissertation, I use a dual-method approach to evaluate the conceptual model of racial/ethnic interaction in concrete healthcare contexts. I combine

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analyses of national survey data with an experimental study. The study using national survey data, reported in Chapter 5, seeks to elucidate large-scale racial/ethnic patterns in patients' evaluations of the quality of their primary care. I test hypotheses that specify the role of patients' race/ethnicity in patients' evaluations of the quality of their care and that predict how the magnitudes of racial/ethnic disparities in the quality of care vary among healthcare settings using managed care and non-managed care insurance policies.

Chapter 6 describes an experimental study designed to evaluate *causal mechanisms* underlying my conceptual model of racial/ethnic interaction in concrete healthcare contexts. It tests hypotheses about the effects of racial/ethnic cognitions and stress on physicians' decisions about a hypothetical patient. Among the goals of the study is to determine the feasibility of an internet-based experimental methodology for subliminal priming.

Chapter 7 discusses the findings of the two empirical studies and offers conclusions. It pays particulates attention to the aspects of my research findings that pertain to the implicit racial/ethnic cognitions and to physician stress. I also explore the implications of my results in the light of current healthcare trends. Finally, I discuss strategies that may help reduce the extent of disadvantages that racial/ethnic minority patients face in the healthcare system.

CHAPTER 2

RACIAL/ETHNIC DISPARITIES IN HEALTH CARE: LITERATURE REVIEW

Race/ethnicity determines Americans' access to various types of valuable social goods. Heath care is one arena of social life in which race/ethnicity clearly plays a stratifying role. A growing body of evidence reveals that minority patients, especially Blacks, Hispanics, and Native Americans, are less likely to receive timely, high quality medical services even when their health status, health insurance, socioeconomic and geographic backgrounds, and a number of other characteristics are comparable to Whites (Smedley, Stith, and Nelson 2003). This chapter starts with a brief review of the evidence showing the existence of racial/ethnic disparities in health care. It continues to outline the current understanding of the sources of these disparities and discuss some of the limitations of this understanding.

Research activity on racial/ethnic disparities in medial care has accelerated during recent decades. Two systematic reviews, "Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare" (Smedley, Stith, and Nelson 2003) and "The National Healthcare Disparities Report" (AHRQ 2003) have assessed the evidence on racial/ethnic disparities in America across healthcare settings and health conditions. "Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare" reviewed more than one hundred rigorous studies in peer-reviewed journals and concluded that in most of these studies, even after controlling for insurance status, patient income, and other access-related factors, Black, Hispanic, and Native American persons were still less likely than White persons to receive needed healthcare services and clinically indicated procedures.

"The National Healthcare Disparities Report" examined racial and ethnic differences, along with differences based on socioeconomic status, age, gender and several other

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dimensions, using national surveys, including Surveillance, Epidemiology, and the End Results program, U.S. Renal Data System, Medical Expenditure Panel Survey, the Centers for Disease Control and Prevention AIDS Surveillance System, National Vital Statistics System, National Immunization Survey, National Health Interview Survey, and National Hospital Discharge Survey. It concludes that racial/ethnic disparities are pervasive, even though they vary in magnitudes by health condition and population. Racial/ethnic disparities exist in care for a range of diseases, including heart disease, cancer, diabetes, kidney disease, mental health problems, HIV/AIDS, and a number of other diseases. They span a variety of settings and types of care, including adult care, maternal, neonatal, and pediatric care, geriatric care, primary care, preventive care, long-term care, dental care, mental health care, substance abuse treatment, emergency care, and care in hospitals and nursing homes. They are observed across all dimensions of the quality of health care, including effectiveness, patient safety, timeliness, and patient centeredness.

Racial/ethnic disparities in medical care are better documented for some racial/ethnic groups than for other groups. Most studies concentrated on Black-White differences. A smaller number of studies have addressed differences in the quality of medical care received by Hispanics and Whites. Even less is known about how the quality of care for Whites differs from quality of care for Asians, Native Americans, Alaska Natives, and Pacific Islanders. Studies comparing the quality of care received by patients of different racial/ethnic minority backgrounds, such as Hispanics vs. Asians, or Native Americans vs. Blacks, are also rare.

The Role of Race/Ethnicity in Specific Aspect of Medical Care

Cardiovascular Care. Disparities in cardiovascular care are among the best-documented types of healthcare disparities, especially for Blacks. Based on a large-scale review, Smedley, Stith, and Nelson (2003) report that with a few exceptions (usually based on smaller samples), Blacks with coronary heart disease and with acute myocardial infarction are significantly less

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likely than their White counterparts to get appropriate treatment, including cardiac catheterization, revascularization, beta blockers, thrombolic therapy, and aspirin. Cumulatively, the reviewed studies controlled for factors such as age, sex, disease severity, comorbidity, symptom expression, and the physician's specialty.

Another independent review was conducted by the Kaiser Family Foundation (2002). The report titled "Racial/Ethnic Differences in Cardiac Care: The Weight of Evidence" is based on 81 peer-reviewed studies of differences in cardiac care for Black and White patients. The majority of these studies find that Black patients are less likely than White patients to receive the appropriate procedures or treatments. Based on the studies with the strongest methodology, the report concludes that Blacks are less likely than Whites to receive diagnostic procedures, revascularization procedures and thrombolytic therapy after a heart attack, and that most of the racial/ethnic differences in care remain after the adjustment for clinical and socioeconomic factors.

The magnitudes of Black-White disparities in cardiac care are often considerable. One study, for example, examined 671 patients who underwent coronary angiography in 1991 at four public and two academically affiliated private hospitals in Los Angeles and were appropriate candidates for coronary revascularization (Laouri et al. 1997). Whites were twice as likely as Blacks to undergo bypass surgery within 12 months and five times as likely to undergo angioplasty within 12 months, even after controlling for clinical characteristics, gender, age, and hospital type. There is some evidence that the racial gaps in cardiac care are larger when the patient's symptoms are more ambiguous and the indication for medical procedures is equivocal. One study examined 666 male patients who were admitted to a VA hospital with acute myocardial infarction or unstable angina and who underwent cardiac catheterization (Conigliaro et al. 2000). Blacks were less likely than Whites to undergo coronary artery bypass grafting when coronary artery bypass grafting was indicated as

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'appropriate and necessary' (odds ratio, 0.44), but the Black-White difference in coronary angioplasty was even larger when the indication was rated 'equivocal' (odds ratio, 0.30). This study controlled for comorbidity factors and cigarette use.

Disparities in cardiac care are less well documented for non-Black racial/ethnic minority groups. Some evidence indicates that Hispanics, like Blacks, tend to receive poorer quality cardiac care compared to Whites, but the extent of the disparities for Hispanics is smaller. Studies including Native Americans and Asians mainly did not find any significant disparities, but the number of existing studies is too small to draw clear conclusions.

Cancer Care. Several studies show racial differences in the receipt of appropriate cancer diagnostic tests (e.g., McMahon et al. 1999) and treatments (e.g., Imperato et al. 1996), while controlling for the stage of cancer at diagnosis and other clinical factors. Christopher Li, Kathleen Malone, and Janet Daling (2003), for instance, studied 125,000 women with newly diagnosed breast cancer between 1992 and 1998. Compared to Whites, Blacks and Hispanics were 20 to 50 percent less likely to receive treatment that met national standards of breast cancer care. Racial disparities are also documented for the management of pain related to cancer. Bernabei et al. (1998) studied 13,625 patients with cancer admitted to nursing homes. Most patients experienced daily pain, but Blacks had a 63 percent higher probability that their pain was untreated, relative to Whites. This study controlled for gender, cognitive abilities, disease severity and comorbidity. Yet, Smedley, Stith, and Nelson (2003, p. 43) caution that "studies of racial disparities in cancer diagnosis and treatment are less clear and consistent than studies of cardiac care, in part because many studies rely on data that use crude or incomplete indicators of the type of treatment provided and/or do not control for co-morbid factors."

HIV/AIDS Care. According to the Smedley, Stith, and Nelson (2003) review, Black and to a lesser extent Hispanic patients with HIV/AIDS are less likely than White patients to receive antiretroviral drugs, diagnostic procedures, such as bronchoscopy, and prophylaxis

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against opportunistic infections that often accompany HIV/AIDS. One study, for instance, found that Blacks and Hispanics with HIV/AIDS infections are 1.54 and 1.40 times as likely, respectively, *not* to receive prescriptions for needed prophylactic medications as White HIV/AIDS patients who are similar in terms of age, sex, health status, insurance coverage, education, and region (Shapiro et al. 1999). In this study, Blacks, on average, waited 13.5 months for the prophylactic medications, while Whites waited only 10.6 months.

Kidney Disease. Blacks with end-stage renal disease waiting for a kidney transplant spend twice as much time on organ donation waiting lists as Whites (Young and Gaston 2000). One study evaluated racial differences in the access to renal transplantation in a random sample of 1,518 recipients of dialysis (Epstein et al. 2000). Among patients considered to be appropriate candidates for renal transplantation, 90 percent of Blacks (vs. 98 percent of Whites) were referred for evaluation. Seventy-one percent of Blacks (vs. 87 percent of Whites) were placed on a waiting list for a kidney. Only 17 percent of Blacks (vs. 52 percent of Whites) received the kidney transplant, while the rest did not, mostly due to a shortage of kidneys. Also interesting are the patterns of care for dialysis patients classified as *inappropriate* candidates for kidney transplantation. Among these patients, 58 percent of Whites (vs. 38 percent of Blacks) were referred for evaluation, 31 percent of Whites (vs. 17 percent of Blacks) were placed on a waiting list, and 10 percent of Whites (vs. 2 percent of Blacks) ultimately received the transplant. A similar pattern of disparities in care for kidney disease is also evident for Native Americans, who, much like Blacks, suffer in excess the risk of end-stage renal disease (Smedley, Stith, and Nelson 2003).

Surgical Procedures and Emergency Care. Particularly disturbing is the evidence on the increased use of non-traumatic limb amputation among minority patients. Collins et al. (2002) showed that compared to Whites, Blacks are 1.5 times *more* likely and Hispanics are 1.4 times *more* likely to receive non-traumatic amputation of the limb, net of the presence of diabetes,

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hypertension, heart disease, behavioral risk factors, and several other possible confounding variables. Whites, in contrast, are more likely to receive bypass revascularization that saves the affected limb. Other studies showed Black-White gaps in the receipt of *indicated* surgical procedures, such as the surgical treatment of glaucoma (Devgan, Yu, Kim, and Coleman 2000) or a gall bladder removal (Arozullah et al. 1999).

Disparities also exist in the use of clearly indicated pain medication in emergency rooms. Todd, Samaroo, and Hoffman (1993) found that Hispanic patients receiving emergency care for long bone fractures were twice as likely as White patients to get no pain medication. Ethnicity remained the strongest predictor of analgesic administration even after controlling for the characteristics of injury and the characteristics of the patient and the physician. One study (Tamayo-Sarver, Hinze, Cydulka, and Baker 2003) compared Black, Latino, and White patients who presented to emergency rooms, using 1997-1999 National Hospital Ambulatory Medical Care Surveys. This study did not find racial/ethnic disparities in the receipt of pain medication for long bone fractures, but revealed that Blacks, but not Latinos, were less likely to receive opioid treatment for migraines and back pain, even after controlling for patients' age, sex, severity of the condition (triage assignment and pain assessment), visit characteristics, hospital ownership, region, urban vs. rural, and year of visit, and expected method of payment (private insurance, Medicare, Medicaid, worker's compensation, self-pay/uninsured). The racial disparity in opioid prescription was the greatest for migraine. The authors suggest that one reason may be that migraine has fewer objective findings than back pain or other sources of pain in emergency rooms, such as trauma.

Timeliness of Care. Timeliness, as one dimension of the quality of health care, was examined by AHRQ (2003). In bivariate analysis, the proportion of adults who sometimes or never got care for illness or injury as soon as they wanted was higher among Hispanic adults compared with non-Hispanic White adults. It was also higher among Black and Asians/Pacific

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Islander adults compared with White adults. In multivariate models controlling for age, gender, income, education, insurance, and residence location, the Black-White difference was not significant, but other racial/ethnic differences persisted. Relative to Whites, Asians/Pacific Islanders were 99 percent more likely to indicate that they sometimes or never got care for illness or injury as soon as they wanted. Hispanics were 45 percent more likely than non-Hispanic Whites to indicate never or sometimes getting timely care. Furthermore, AHRQ (2003) reported that from 2000 to 2001, the proportion of adults who sometimes or never got care for illness or injury as soon as they wanted it decreased among White adults but not among minority adults.

Interpersonal Care. Racial/ethnic minority patients face a definite disadvantage in multiple interpersonal aspects of care. Compared to White patients, minority patients give lower ratings of the global quality of care and report less satisfaction with their care (Shi 2000, Andersen, Giachello, and Aday 1986, Henry J Kaiser Family Foundation 1999, Doescher, Saver, Morales, Reise, and Hys 2000). Racial/ethnic gaps exist in patients' evaluations of healthcare providers' communication (Shi 1999), listening (Blendon, Aiken and Corey 1989), and sharing information (Cooper-Patrick et al. 1999), as well as in reports of patient participation in the process of care and medical decision-making (Saha et al. 1998). Not unlike in the case of the technical quality of care (such as the delivery of procedures and treatments), lower average socioeconomic status, greater likelihood of being uninsured or being covered by Medicaid (Smedley, Stith, and Nelson 2003), lower likelihood of having a usual source of care (Weinick, Zuvekas and Cohen 2000) and poorer health status explain only part of the racial/ethnic gaps in the perceived quality of interpersonal health care. A sizable portion of these gaps remains unexplained.

An analysis of a large national survey, for instance, revealed that all racial/ethnic minority groups were more likely than Whites to report that their healthcare providers only

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sometimes or never listened to them carefully (AHRQ 2003). In multivariate models controlling for age, gender, income, education, insurance, and residence location, the difference between Hispanic and non-Hispanic Whites dissipated, but other racial/ethnic differences persisted. The magnitude of disparities was the largest for Asians/Pacific Islanders, who were 73 percent more likely than Whites to report having healthcare providers who sometimes or never listen carefully.

Among some minority patients, limited English proficiency is an additional obstacle to receiving high-quality interpersonal care. Patients whose primary language is not English and those who communicate through an interpreter are less satisfied with their care overall and give lower ratings of the physician's courtesy, respect, and communication (Harpole, Orav, Hickey, Posther, and Brennan 1996, Weech-Maldonado et al. 2003, Carrasquillo, Orav, Brennan, and Burstin 1999, David and Rhee 1998, Morales, Cunningham, Brown, Liu, and Hays 1999). One study reports that among Hispanic and Asian parents, the negative effect of language barriers on their ratings of health care received by their children is even stronger than the effect of race/ethnicity (Weech-Maldonado et al. 2001).

Sources of Racial/Ethnic Disparities

While the body of evidence on racial/ethnic disparities in medical care has been growing, less is known about *why* these differences exist and how they are sustained.

Access-Related Factors

One often-invoked argument is that disparities in the quality of care can be explained by factors that hinder access to health care among minorities. Access-related explanations contend that poorer financial resources, less comprehensive health insurance, and under-funded facilities where care is obtained contribute to minority patients' disadvantage in the quality and quantity of the medical care they receive. These explanations are rooted in the social stratification tradition. Compared to Whites, Blacks, Hispanics, and Native Americans are

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more likely to have low education and income, and to be unemployed or underemployed.[3] These characteristics are associated with a risk for poorer or no access to health care. Such factors include the lack of insurance or underinsurance. Non-White adults and children are more likely than White adults and children to be uninsured. They are also more likely than Whites to rely on public insurance programs, such as Medicaid, which have been shown to provide inferior medical care compared to private insurance plans (Freund and McGuire 1999).

Another access-related obstacle to high quality care is the lack of a usual source of care. Based on data from Medical Expenditure Panel Survey, AHRQ reports that 30 percent of Hispanic and 20 percent of Black Americans lack a usual source of health care compared with less than 16 percent of Whites (http://www.ahrq.gov/research/disparit.htm). These differences are even more pronounced among children. Hispanic children are nearly three times as likely as non-Hispanic White children to have no usual source of health care. Instead of relying on their regular physicians, Black and Hispanic patients are more likely than White patients to receive their care in emergency rooms (Burt and McCaig 2001) or in other settings where the attention to the underlying causes of the acute complaint and to preventive care can be limited at best, and where long-term patient-physician relationships are unlikely to develop. Since having a usual source of care is positively associated with the likelihood of receiving preventive care and other important health services, the lack of a usual source of care may exacerbate racial/ethnic disparities in the quality of care.

Model Proposed by the Institute of Medicine

Smedley, Stith, and Nelson (2003) propose a model specifying the factors that contribute to racial/ethnic differences in health care *not related to access*. The model consists of the following types of factors:

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[3] Asians as well as some Hispanic groups represent minorities with relatively high SES. Access-related arguments do not apply to these groups as well as they do to economically disadvantaged minority groups.

(1) *Patient-Level Factors*. These factors include patients' attitudes, preferences, and medical mistrust. The review by Smedley, Stith, and Nelson (2003), however, indicates that the contribution of patient-level factors is small. Blacks are only 3-6 percent more likely than Whites to reject medical recommendations. Their slightly higher likelihood of refusal may be underpinned by the mistrust of healthcare providers and of health care in general, by past negative experiences in the clinical encounter, or by perceptions that their doctor is not invested in their care. Nevertheless, patient-level factors have limited utility for explaining the large racial/ethnic differences in the overall quality of care.

(2) *System-Level Factors*. Among these factors are the legal and regulatory climate, organizational policies (e.g., strategies implemented by healthcare plans to control the quality and quantity of care), and cultural or linguistic barriers (e.g., the availability of interpretation services). Fragmentation of care may also disproportionately disadvantage minority patients. Maneuvering through clinical bureaucracies may be more difficult for some minority patients who are less familiar with bureaucratic cultures or have limited command of English. The system-level factors are decidedly more important contributors to racial/ethnic disparities in healthcare than patient-level factors, but our understanding of these factors is rudimentary (Van Ryn and Fu 2003).

(3) *Provider-Level Factors*. Provider-level factors are perhaps the least well documented and the most controversial. They include factors such as racial/ethnic biases and stereotypes among healthcare providers. For example, due to ethnic/racial biases, some physicians may conclude that minority patients are poorer candidates for a particular treatment than White patients with identical clinical characteristics because they are less likely to comply with the prescribed treatment, adhere to medical regimens, and/or show up for appointments.

Several empirical studies have provided preliminary evidence for the plausibility of theoretical arguments stressing physicians-level factors in racial/ethnic disparities. In a study

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by Kevin Schulman and colleagues (1999), Black and White actors portrayed patients with identical chest pain symptoms. Physicians were less likely to recommend cardiac catheterization, a resource-intensive diagnostic procedure, for Black female "patients" than for White female "patients"; the likelihood of recommending this procedure for Black and White males did not differ.

In another study, Michelle Van Ryn and Jane Burke (2000) asked physicians to rate real patients who had undergone coronary angiograms. Compared to White patients, Black patients were rated as less intelligent, less educated, less likeable, less friendly, less likely to adhere to medical advice, and more likely to abuse alcohol and drugs. Such differences in the physicians' perceptions of White and Black patients persisted even after controlling for patients' sickness, age, depression, social assertiveness, and physicians' socio-demographic characteristics, including race. Yet another study showed that physicians evaluated minority patients' likely adherence to the medical regimen as lower than Whites' likely adherence (Bogart, Kelly, Catz and Sosman 2000). Since the physicians' decision making about allocating technical care is influenced by their judgments about the treatment candidate's adherence (Bogart Kelly, Catz and Sosman 2000), racial/ethnic stereotypes about non-adherence may in the end lead the physicians to decide that a minority patient is not a good candidate for procedures that require patient compliance with long-term or complex medical regimens (as has been argued in the case of transplants).

Other healthcare providers, including physician assistants, nurse practitioners, nurses, physical therapists, and the technical and administrative staff of healthcare organizations, might also contribute to racial/ethnic disparities in the quality of health care, since many medical decisions are made by these professionals. A nurse practitioner, for instance, may spend less time counseling a patient on risk behaviors, because he doubts a racial/ethnic minority patient will have the resources and motivation to implement and sustain needed

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behavioral changes. Many similar examples come to mind, but the empirical evidence on the contribution of non-physician healthcare providers to racial/ethnic disparities is limited.

Critique of the Current Understanding

There are several theoretical and empirical limitations to previous work on sources of racial/ethnic disparities in health care. *On the theoretical level,* an important limitation is the missing model of micro-level mechanisms through which racial/ethnic disparities in the quality of care arise and are sustained. In the absence of a model of the mechanisms leading to racial and ethnic bias in medical decisions, it is impossible to predict circumstances in which physicians' perceptions will or will not be influenced by patients' characteristics (see Van Ryn and Fu 2003).

A model of micro-level mechanisms must pay attention to *automatic racial/ethnic cognitions* among physicians. The failure of previous research to address automatic components of social cognition involved in racial/ethnic interactions between physicians and patients is a serious omission since according to social psychological research, biases against racial/ethnic minorities and other disadvantaged groups work primarily outside of conscious awareness (Devine 1989, Greenwald and Banaji 1995, Wittenberg, Judd and Park 2001). Such automatic racial/ethnic cognitions explain why many Americans find racism repulsive; yet continue to behave in ways perpetuating racial/ethnic inequalities (Dovidio 2001). Chapter 3 provides a fuller review of the research on automatic cognitive processes related to race and ethnicity as social categories.

Another important issue that has not been adequately addressed in the existing scholarship is the role of *institutional and organizational contexts* in racial/ethnic disparities in the quality of health care. Organizational and institutional factors are specified among system-level factors in the IOM's model. The problem with the IOM's specification is that such factors are treated mainly as *mediators* of the effects of race/ethnicity on healthcare outcomes.

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The model assumes that minority patients are more likely to get their care in certain types of contexts, which, in turn contribute to poorer quality care. No attention has been paid to potential *moderating* effects of institutional and organizational factors in healthcare disparities. Contexts may contribute to disparities by shaping the likelihood that the physicians will engage in behaviors that disadvantage their minority patients. In some settings, physicians may be more likely to rely on racial/ethnic stereotypes about minority patients, less likely to serve as advocates for patients, or less likely to help them obtain high-quality care and navigate through the clinical bureaucracy. Hence, the characteristics of the context of medical care may shape the degree to which patients' racial/ethnic backgrounds influence healthcare processes and outcomes. Importantly, no model, to my knowledge, has yet explored the role of specific contextual factors in racial/ethnic cognitions in the healthcare arena.

On the empirical level, there is limited evidence on provider-level and system-level factors contributing to racial/ethnic disparities in health care. Another limitation is that studies of disparities in the delivery of health care have concentrated on Black-White comparisons. *Non-Black minorities*, including Hispanics, (the fastest-growing minority population in the United States), have received limited attention. Finally, few studies have considered the *physicians' race/ethnicity* in racial/ethnic cognitions. The combination of a physician's race and a patient's race is an important influence on the physician-patient encounter (Saha et al. 1998, Cooper-Patrick et al. 1999, Malat 2001, LaVeist and Nuru-Jeter 2002). Patients tend to have most positive experiences with physician-patient interactions when their race matches the physician's race. Arguably, the combination of a physician's race and a patient's race also influences physicians' medical decision making, possibly making anti-minority biases in medical decisions less common when the physicians' race matches the patient's race (referred to as racial concordance).

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In the following chapters, I develop and empirically test a model of processes contributing to racial/ethnic disparities in the quality of health care that addresses some of these limitations of the existing scholarship. Specifically, the model proposed in Chapter 4 concentrates on the micro-level, socio-psychological mechanisms through which racial/ethnic disparities in the quality of care arise and are sustained, paying special attention to racial/ethnic cognitions, especially in their automatic forms. The model also specifies how concrete contextual factors, especially stress-inducing organizational characteristics, may interact with these cognitions in ways that may lead to poorer care for minority patients. In the next chapter, the theoretical foundations of the model are laid out.

CHAPTER 3

FORMULATING A MICRO-LEVEL MODEL OF RACIAL/ETHNIC INTERACTION

Instances of interpersonal interactions can be seen as the focal points where larger-scale inequalities are both instantiated and challenged. Larry Bobo and Cybelle Fox (2003, p. 319) elaborate on the mutually constituting relationships between social cognition, interpersonal interaction, and inequality, and make a case for applying social-psychological perspectives to the study of these relationships:

> "The basic social processes invoked by the terms *race, racism,* and *discrimination* are quintessentially social psychological phenomena. [...] These concepts concern the meanings of social groupings and how those meanings come to guide patterns of relations among individuals recognized as members of particular groups. They immediately entail the labeling and social learning of group categories, identity, feelings, beliefs, and related cognitive structures. These factors, in turn, are expressed in lines of interaction and behavior that flow from, reinforce and reconstitute, or come to transform those social categorizations. In addition, such categorizations have direct implications for the structure and basic conditions of social organization. That is, race, racism, and discrimination are also, and perhaps most fundamentally, bases and mechanisms of hierarchical differentiation that shape the ordering of social relations as well as the allocation of life experiences and life chances (Zuberi 2001)."

In this chapter, I selectively review the literature that helps us understand how people cognitively process information about social categories, including race/ethnicity, and how these cognitive processes influence interpersonal behavior. I briefly describe stereotypes and other forms of social cognition that apply to race/ethnicity and outline a common explanation for the existence of stereotypes, which posits that stereotypes are essentially energy-saving devices helping people efficiently process large amounts of information present in various social environments. I pay special attention to social categorization and stereotyping that occur automatically, without the perceiver's conscious awareness or intention. I conclude this chapter by formulating a model of how race/ethnicity affect interpersonal interaction in concrete

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contexts, which is consistent with the theoretical arguments as well as empirical evidence in the cognitive social psychology.

Social Cognition: Categorization, Stereotypes and Prejudice

Social cognition can be broadly defined as "the study of how people make sense of others and of themselves" (Fiske and Taylor 1991, p. 1). In the following section, I address three types of processes in social cognition that are particularly relevant in relation to race/ethnicity: categorization, stereotyping, and prejudice.

Social Categorization. Social categorization is a fundamental tool that people use to organize social interaction and make it meaningful. Social categorization involves sorting others into an in-group category and an out-group category (Brewer 1997, Fiske 1998, Turner and Tajfel 1979). Such sorting is typically accompanied by underestimating within-group differences, and by overestimating between-group differences (Brown 1995). People tend to make favorable evaluations of their own in-group compared to other groups. People also feel more comfort, obligation, and trust toward in-group members and favor in-group members when distributing rewards (Brewer and Brown 1998, Fiske 1998). They tend to attribute the success of in-group members and the failure of out-group members to internal factors, while attributing the failure of in-group members and the success of out-group members to situational factors. According to social identity theory, in-group favoritism and out-group derogation are driven by the need to enhance individual and collective self-esteem (Turner and Tajfel 1979).

Stereotypes. James Hilton and William Von Hippel (1996, p. 240) define stereotypes as "beliefs about characteristics, attributes, and behaviors of members of certain groups." A similar definition maintains that stereotypes are "cognitive structures that contain the perceiver's knowledge, beliefs, and expectations about human groups" (Hamilton and Trolier 1986, p.133). Stereotypes differ from other generalizations in that they are applied uniformly

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to all group members, and in this way they tend to be extreme – i.e., "moderately intelligent" would hardly be part of a stereotype (McArthur in Hastorf and Isen 1982). Larry Bobo (2001, p. 268) stresses the relationship between stereotypes and other perceptions or behavior: "stereotyping has a strong potential to influence other perceptions about, behavior toward, and patterns of interaction with members of the stereotyped group."

Prejudice. Prejudice can be defined as a stereotype with an attitudinal dimension (Secord and Backman 1974).[4] Attitudes are "favorable or unfavorable dispositions toward social objects, such as people, places, and policies" (Greenwald and Banaji 1995, p. 7). In racial prejudice, negative attitudes (or characteristics with a negative emotional valence) are attached to members of a racial/ethnic minority group. Thomas Pettigrew, for instance, defines prejudice as "antipathy accompanied by a faculty generalization" (1981, p. 3).

Importantly, many authors stress the irrationality and unfairness of the attitudes that constitute prejudice. Katherine O'Sullivan See and William Julius Wilson (1989, p. 227) propose that prejudice is "an attitudinal dimension of intergroup relations" and that it is linked to "the processes of stereotyping and aversion [that] may persist *even in the face of countervailing evidence*" (italics added). Thomas Pettigrew (1981, p. 2) argues that prejudice involves "*irrationally* based negative attitudes against certain ethnic groups and their members" (italics added). John Dovidio (2001, p. 829), writes that prejudice is commonly defined as "an *unfair* negative attitude toward a social group or a person perceived to be a member of that group" (italics added).

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[4] A clean distinction between stereotypes and prejudice is possible theoretically, but is more difficult once we consider the empirical manifestations of stereotypes and prejudice as they relate to race/ethnicity. The issue that complicates this distinction is that many stereotypes about racial/ethnic minority groups are *negative in their content.* Negative content of stereotypes is necessarily associated with negative emotions, which are among the defining attributes of prejudice.

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Given the irrationality and unfairness of many racial/ethnic cognitions, it is important to ask: How and why are categorization, stereotypes and prejudice sustained at the level of the society? Some answers can be found in the social psychological scholarship on status. Theories of status concentrate on the status dimension of stereotypes, explaining how and why people sharing these cultural beliefs attach different status value to people belonging to different social groups. The consensual beliefs about the status-value of individual characteristics arise through social interaction between and among people with unequal material resources (Ridgeway and Balkwell 1997, Ridgeway, Boyle, Kuipers, and Robinson 1998). Shared cultural beliefs carry with them expectations about the competence and warmth of the members of social groups. Moreover, the shared cultural beliefs shape the likelihood that one actor will treat another with deference (Ridgeway and Berger 1986, Berger, Ridgeway, Fisek, and Norman 1998). Expectations of better performance by high status individuals and of worse performance by lower-status individuals are self-fulfilling (Berger, Cohen, and Zelditch 1972, Ridgeway 1997).

The theory of stereotype threat, proposed by Claude Steele and Joshua Aronson (1995, 1998), provides further insights into the self-perpetuating nature of racial/ethnic cognitions. Stereotype threat is activated for individuals who are performing tasks that are stereotyped for the member of a social category to which these individuals belong. For instance, Blacks may experience stereotype threat when performing math tasks because they may fear being stereotyped as underperformers in math. When individuals experience the stereotype threat, i.e., fear that they will be evaluated negatively because of their race or other status, they perform worse on cognitive tasks than when the stereotype threat is not present. In an influential study, Steele and Aronson (1995) showed that when a verbal test was presented as diagnostic of ability, Blacks performed worse on this test than Whites. When the test was not presented as diagnostic of ability, Blacks did not differ in their performance from Whites.

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These results persisted even in models that controlled for the actual performance on the Scholastic Aptitude Test. Merely asking Blacks to record their race was enough to impair their test performance. Steele and Aronson (1998) explain that talented African Americans may underperform on standardized tests because they know that any mistakes they make could cause them to be seen through the lens of a negative racial stereotype. The pressure may be so great that it undermines test performance, especially among those individuals who base their self-regard on academic achievement.

Interestingly, the stereotype threat effects were shown also for White males when a comparison with Asians, a minority group stereotyped to excel at math, was invoked (Aronson et al. 1999). Similar detrimental effects of the gender stereotype threat on math performance of women exist (Spencer, Steele, and Quinn 2002). The stereotypes do not seem to affect self-expectations but seem to create an atmosphere of mistrust that fosters underperformance (Marx, Brown, and Steele 1999). Geoffrey Cohen and Claude Steele (2002) elaborate on how students who feel they are stigmatized may be mistrustful of their teachers, especially if the teachers have different racial, ethnic, or gender backgrounds than the students. Mistrust may then decrease motivation and performance.

Contents of Racial/Ethnic Stereotypes and Prejudice

Most research on the content of racial/ethnic stereotypes has concentrated on Whites' stereotypes about Blacks. Whites' stereotypes of Blacks contain overwhelmingly negative characteristics, especially hostility, aggressiveness, irresponsibility, and unintelligence. Sniderman and Piazza (1993) assert that among Whites, "rarely less than one in every five and sometimes as many as one out of every two agree with frankly negative characterizations of Blacks, particularly characterizations of Blacks as irresponsible and as failing to work hard and to make a genuine effort to deal with their problems on their own" (p. 12). In one recent study, when asked to choose five most characteristic attributes of Blacks, 20 percent of White

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participants chose "loud" and 16 percent chose "aggressive." "Quick tempered", "rude", and "revengeful" were each chosen by 14 percent of the Whites (Madon et al. 2001). Several other studies show that contemporary stereotypes of Blacks include hostility, aggressiveness and violence (Devine and Elliot 1995, Dovidio, Evans, and Tyler 1986). Based on 1990 General Social Survey (GSS) data, one study reports that "31 percent of Whites gave Blacks a low absolute rating in terms of intelligence, 47 percent did so in terms of laziness, 54 percent did so concerning proclivity to violence, and 59 percent did so concerning preference to live off of welfare" (Bobo, Kluegel, and Smith 1997, pp. 100–101). The pattern of negative stereotypes is even clearer when the researchers consider the differences between Whites' ratings of their own racial group and Whites' ratings of Blacks. Among White respondents, 54 percent rated Blacks as less intelligent than Whites, 62 percent rated Blacks as lazier than Whites, 56 percent rated Blacks as more prone to violence than Whites, and 78 percent rated Blacks as more welfare dependent than Whites (Bobo, Kluegel, and Smith 1997).

This is not to say that the content of Black stereotypes is exclusively negative. Rather, the Black stereotypes contain a mix of positive and negative characteristics, which appears to vary by gender. One study, which made use of free response methodology known to evoke more schematic and hence more automatic processing than do checklist methodologies, asked college students to generate a list of traits typical for males and females belonging to various social groups and to rank these traits from most to least characteristic (Neiman, Jennings, Rozelle, and Baxter 1994). The characteristics of Black males, in order, included "athletic", "antagonistic", "dark skinned", "muscular", "criminal", "speaking loudly", "tall", "intelligent", "unmannerly", "pleasant", "lower-class", "ambitionless", "non-college", "racist", and "sociable". The characteristics of Black females included "speaking loudly", "dark skinned", "antagonistic", "athletic", "pleasant", "unmannerly", "sociable", "intelligent", "attractive", "lower class", "egotistical", "ambitionless", "caring", "humorous", and "honest". This study

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reveals that there are substantial differences between the content of stereotypes about Black males vs. stereotypes about Black females, with stereotypes about Black males being more negative.

Importantly, stereotypes are not static, but they change over historic time. According to Larry Bobo (2001), "the single clearest trend shown in studies of racial attitudes has involved a steady and sweeping movement toward general endorsement of the principles of racial equality and integration" (Bobo, 2001, p. 269). Some negative characteristics commonly associated with Blacks in the past are much weaker parts of the stereotype, or may no longer be parts of the stereotype. Madon et al. (2001) cite Katz and Brady, who found that 75 percent of White respondents in 1933 believed that Blacks are lazy. In a recent replication of the study, only 12 percent of White respondents believed that laziness was one of the five most characteristic attributes of Blacks (Madon et al. 2001). Yet, a belief that Blacks prefer to live off of welfare, which can be seen as a recent reincarnation of the belief in Blacks' laziness, is still a prominent part of the Black stereotype (Bobo and Zubrinski 2003).

Clearly, the trend in racial/ethnic stereotypes and attitudes in America is more complicated than just a simple decline in Whites' negative stereotypes. Bobo (2001, p. 278) stresses the following about contemporary stereotypes:

> "[They] differ in several important ways from stereotypes that were prevalent in the past. First, they are much more likely to be understood as the product of environmental and group cultural traditions, whereas, in the past, they were unequivocally taken as the product of natural endowment. Second, there is growing evidence that many Whites are aware of traditional negative stereotypes of Blacks, as anyone immersed in American culture would be, but personally reject the negative stereotype and its implications (Devine and Elliot, 1995). The problem is that in many face-to-face interactions, the traditional stereotype controls perception and behavior (Devine, 1989)."

Some scholars contend that Whites' stereotypes about Blacks tend to be stronger and more negative than Whites' stereotypes about other minority groups. Nevertheless, Whites'

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stereotypes about Hispanics and other non-Black minorities also tend to be negative, albeit to a lesser degree. Bobo (2001) reports that based on 1990 GSS data, more than 50 percent of Whites rated Hispanics as less intelligent than Whites, similar percentage rated Hispanics as prone to violence, and more than 60 percent of Whites rated Hispanics as preferring to live off of welfare. Thomas Wilson (1996) analyzed GSS data on Whites' stereotypical beliefs about Blacks, Hispanics, Asians and Jews. Respondents rated each racial ethnic group "in general" on five undesirable traits. Blacks, Hispanics and Asians were rated higher than Whites on all five undesirable traits. Blacks received the highest mean rating on the traits "violent", "lazy" and "welfare dependent". Hispanics received the highest ratings on "unintelligent" and "unpatriotic". Jews were rated higher than Whites only on "unpatriotic".

Yolanda Niemann and her coauthors (1994) conducted a study using free response methodology to generate and rank stereotypes. The results suggest that stereotypes about Hispanics, especially about Mexican males, may be similar to those about Blacks in that they contain a mix of negative and positive characteristics, with the negative characteristics predominating. The list of features characteristic of Mexican males, generated and ranked by college students, included, in rank order, the following: "lower class", "hard worker", "antagonistic", "dark skinned", "ambitionless", "family-oriented", "short", "criminal", "poorly groomed", "unmannerly", "intelligent", and "alcohol user". The features of Mexican females were much more positive, and they also tended to include more physical characteristics, at least among the attributes ranked as most characteristic of this group. The fifteen highest ranked characteristics included "dark haired", "attractive", "pleasant", "dark skinned", "overweight", "baby maker", "family oriented", "caring", "intelligent", "sociable", "non-college", "ambitionless", "passive", "short", and "antagonistic".

Much less is known about what stereotypes, if any, non-White Americans hold about their own racial/ethnic groups and about other minority groups. Theories of status imply the

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negative *valence* of stereotypes about non-Black racial and ethnic minorities. Cecilia Ridgeway and her co-authors (1998, p. 332) stress that "people in all categories agree or at least concede that one status category is better than other(s)." Race and ethnicity are status characteristics. Being a non-Hispanic White has a higher status value than being a member of another racial or ethnic group. Therefore, we may expect that the valence of stereotypical beliefs about all minority groups, including non-Black minorities, will be more negative compared to stereotypes about Whites.

In fact, there is some evidence that minority members may endorse stereotypes about their own groups, even if these stereotypes are negative. Yolanda Niemann (2001) reviewed the literature on stereotypes about Chicanas/os, concluding that Chicanas/os themselves often endorse stereotypes held by Whites, who see them predominantly in derogatory terms, with the few positive characteristics primarily related to the centrality of the family.

Further evidence that the knowledge of, and, in some cases, the endorsement of racial/ethnic stereotypes, at least in their main contours, permeate racial/ethnic boundaries and may even extend to the stereotyped groups, comes from Madon et al.'s (2001) study that took a comprehensive look at the similarities and differences between the racial/ethnic stereotypes among Whites and non-Whites. The study found a significant agreement between the overall contents of Whites' and non-Whites' racial/ethnic stereotypes. Yet, despite this general agreement, there were some significant differences between Whites' and non-Whites' ratings of different racial/ethnic groups' specific attributes. In comparison to Whites, non-White respondents rated Blacks higher on their ability to sing and dance as well as on being "masculine", "tough", "strong", "pleasure loving", "energetic", "active", "outgoing", and "proud". Italians were rated higher on being demanding by non-White respondents compared to White respondents. Compared to Whites, Non-Whites also rated Jews as more patriotic, and Chinese as less disciplined.

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Larry Bobo and Camille Zubrinsky (2003) qualify the argument for the general status order of racial/ethnic groups by pointing out that in-group preference is also a factor in stereotypes and prejudice. People generally have most positive *attitudes* toward the members of their own racial/ethnic group. The authors investigate in-group attitudinal preference using a procedure known as the feeling thermometer, commonly used to measure group attachments. All racial/ethnic groups in this study, including Whites, Blacks, Hispanics and Asians, expressed in-group preference on the feeling thermometer. In contrast, when asked to rate their own as well other groups on measures of stereotypical traits, such as "unintelligent", "welfare dependent" and "hard to get along with," all racial/ethnic groups rated Whites, not their own racial/ethnic groups, most favorably (i.e., as lowest on the stereotypical traits). Hispanics, Asians and Whites consensually rated Blacks as more unintelligent and more welfare dependent than any other racial/ethnic group. Whites and Blacks rated Asians as the hardest to get along with. Hispanics and Asians gave the highest ratings on "hard to get along with" to Blacks. Bobo and Zubrinski (2003) summarize that "Blacks receive the most negative overall ratings and whites, predictably, receive the most favorable ratings. Asians and Hispanics tend to fall in between, with ratings of Hispanics quite close to those for Blacks and ratings for Asians quite close to those for whites (p. 894). The authors maintain that "this pattern...points to the presence of an American racial rank order, with whites *consensually* regarded as occupying the most preferred social position" (p. 891).

Efficiency of Social Cognitions

Most theoretical approaches to stereotypes share a common assumption that stereotypes are motivated by the need for cognitive efficiency. Cognitive efficiency can be defined as the amount of information gained for the effort expended (Sherman 2001, p. 183). Social psychologists widely accept that categorization and stereotyping are more cognitively efficient than individuation (Allport 1954, Bodenhausen, Macrae, and Garst 1998, Brewer 1988, Fiske

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and Neuberg 1990). In other words, humans expend more cognitive energy attending to characteristics that are unique about the individual compared to characteristics that are common to the individual and others belonging to the same social category. By sorting people into categories and using stereotypes, people act as "cognitive misers" using the least possible amount of cognitive resources to process information about their social environments (for overview, see Fiske and Taylor 1991).[5]

One often-cited study supporting the argument that stereotypes serve to economize cognitive resources examined responses to stereotypes among subjects who performed two cognitive tasks simultaneously (Macrae, Milne, and Bodenhausen 1994). Subjects who were exposed to non-stereotypical word pairings performed worse on the secondary cognitive task than did the participants who were exposed to stereotypical word pairings. This result suggests that the stereotypical presentation of information freed up cognitive resources for the secondary task. Several other studies supporting the cognitive efficiency argument are reviewed in the section on the contextual effects in social cognition.

Automatic Social Cognition

Social psychologists distinguish two types of mental processes: explicit or conscious processes and implicit or unconscious processes. According to Anthony Greenwald and Mahzarin Banaji (1995) "the terms implicit-explicit capture a set of overlapping distinctions that are sometimes labeled as unaware-aware, unconscious-conscious, intuitive-analytic, direct-indirect, procedural-declarative, and automatic-controlled." Automatic cognitions regarding members of social categories are "the introspectively unidentified (or incorrectly identified) traces of past experience that mediate attributions of qualities to members of social categories" (Greenwald and Banaji 1995, p. 15). They are rooted in normal cognitive processes

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[5] Cognitive miser models are rooted in the decision-making literature that argues that people use heuristics to conserve cognitive resources (Tversky and Kahneman 1974).

that help people efficiently process large amounts of social information (Allport 1954, Fiske and Neuberg 1990, Tversky and Kahneman 1974). Automaticity of stereotypes about social groups develops at a young age, similar to the automaticity of other cognitive tasks (Devine 1989). The non-conscious nature of these biases may allow people maintain their egalitarian values and non-prejudiced self-image, without posing the need to challenge the deeply ingrained negative feelings about minorities. Even among persons who actively strive to be non-prejudiced, such cognitive structures and related attitudes may not lend themselves easily to conscious efforts. Therefore, they subtly affect behavior even among persons who want to act in non-prejudiced ways.

The importance of automatic social cognition has been amply documented over recent decades (for a review, see Fiske 1998). Studies have shown the importance of automatic processes in stereotyping based on race (Devine 1989, Dovidio, Kawakami, Johnson and Howard 1997), sex (Blair and Banaji 1996) and age (Hense, Penner, and Nelson 1995). Irene Blair (2001) for instance, cites over 30 studies documenting that Whites have strong implicit negative associations with Blacks and strong implicit positive association with Whites. Bernd Wittenberg and co-authors (2001, p. 815) summarize that recent work in psychology leaves little doubt that:

> "...stereotypes and group attitudes may indeed be activated spontaneously from memory, without the perceiver's intent, merely triggered by exposure to a relevant stimulus cue in the environment. Such automatic activation occurs quickly, within a few hundred milliseconds after stimulus exposure. It requires only very limited cognitive resources and is not controllable by the perceiver. In fact, the perceiver often remains unaware of the activation and its subsequent influences on judgment and behavior."

Experimenters have used a variety of ingenious methods to study automatic racial cognition. One group of studies relies on activation of the automatic cognition accomplished by exposing participants to a stereotype-related stimulus in a verbal form (e.g., racial stereotype-laden words) or in the form of an image (faces of members of a minority

racial/ethnic group). In studies using subliminal priming, the stimulus is presented for a very short period of time so that participants are unaware of the stimulus. The duration of the stimulus presentation distinguishes subliminal priming from supraliminal priming. In supraliminal priming, stimuli are presented long enough so that the participants are aware of them and can control their influence on the tested behavior or judgment.

Verbal primes have a longer tradition in social psychology than pictorial primes. As early as in 1983, Gaerther and McLauglin showed that college students were faster to identify stereotypical word pairs such as "Black-lazy" than counter-stereotypical word pairs such as "White-lazy or "Black-ambitious." Patricia Devine (1989) subliminally primed participants with words associated with the Blacks, such as "busing", "slavery", or "jazz," varying the number of the presented words. Participants who saw a large number of these words interpreted the behavior of an ambiguously hostile, ethnically non-specific individual described in a vignette as more hostile than those who saw a small number of words. Lorella Lepore and Rupert Brown (1997) primed participants in the experimental group with parafoveally flashed racial category labels and their neutral associates (Blacks, Afro-Caribbean, West Indians, colored, afro, dreadlocks, Rastafarian, reggae, ethnic, Brixton, Notting Hill, rap, and culture). Participants in the control group received priming by neutral words. Participants then rated the ambiguously hostile behavior of a target. Among participants who scored highly on an explicit prejudice measure, Black priming (vs. neutral priming) increased the ratings of negative traits of a target and decreased the ratings of positive traits. For low-prejudice participants, Black priming increased ratings on positive scales but did not affect the ratings on the negative ones.

Pictorial primes, mostly using images of faces, have been gaining popularity in recent years. John Dovidio and his co-authors (1997) found that Whites have faster response times to negative traits after being subliminally primed with Black faces than after being subliminally

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primed with White faces. Several other authors used priming with images of faces to obtain effects of implicit racial bias on behavior in subsequent interracial interactions. These studies showed that Black primes increased Whites' hostility and decreased friendliness (Bargh et al. 1996, Chen and Bargh 1997) and that they increased competitiveness for high-prejudice White subjects (Brown et al. 2003).

Many studies have used response latency to measure stereotypes, with the assumption that the activation of an implicit stereotype produces a faster response than the activation of an implicit counter-stereotype. A commonly used implicit measure of stereotypes building on response latency and the use of supraliminal stimuli is the Implicit Association Test (IAT), developed by Anthony Greenwald and his colleagues in 1998. The participants are asked to categorize stimuli as they appear on the computer screen. For instance, in an IAT measuring racial stereotypes, participants first categorize stimuli, such as names or faces, as (typical) Black versus White. Second, they categorize clearly valenced words (e.g., "evil" or "joy") as "pleasant" or "unpleasant", or "good" or "bad", depending on the form of the test. Third, these two categorization tasks are combined. Participants perform the combined task twice; once with one category labeled Black/pleasant and the other labeled White/unpleasant, and once with one category labeled Black/unpleasant and the other White/pleasant. The faster response to one of these combinations is taken to signify a stronger association between concepts, which in turn suggests an implicit attitude. More generally, the closer the association of stimuli, the faster the response will be. In one of the original IAT experiments, Greenwald et al. (1998) found that participants responded much faster to Black/unpleasant than to Black/pleasant.

A variety of other measures of automatic racial bias have been used. One study used a measure of the stereotype-explanatory bias that relied on the participant's completion of sentences describing a behavior (Von Hippel, Sekaquaptewa, and Vargas 1997). Generating relatively more external attributions (or fewer internal attributions) for behaviors that were

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incongruent with the Black stereotype than for behaviors that were congruent with the Black stereotype indicated higher levels of bias. This study reported a relationship between the stereotype-explanatory bias and the degree to which participants judged a videotaped Black individual requesting money from another person as threatening.

To conclude, no matter what measures of implicit racial cognition are used, the evidence is overwhelming that the content of White's implicit stereotypes about Blacks is more negative than the content of Whites' implicit stereotypes about Whites. Similar to the research on explicit racial/ethnic stereotypes, however, the research on implicit stereotypes has typically neglected non-Black racial and ethnic minorities. One exception is a study of stereotypes about Asian Americans conducted by Jose Abreu and his colleagues (2003). Participants in the experimental condition were exposed to words associated with the "Yellow Peril" stereotype of Asian Americans. Participants in the control condition were exposed to neutral words. All participants then read a vignette and evaluated the person portrayed in the vignette on several dimensions. Participants in the experimental group gave more negative evaluations, but only on items closely linked to Asian Americans.

Social Cognition and Behavior

The relationship between automatic cognition and behavior must be established to make use of the findings on automatic social cognition for explaining biased decisions and behaviors. While the evidence on how strongly the cognitions and attitudes in general and automatic cognitions and attitudes in particular relate to behavior remains inconclusive, scholars tend to agree that automatic processes can have real consequences for thought and conscious behavior (Bargh et al. 1992, Bargh, Chaiken, Raymond, and Hymes 1996, Fazio et al. 1986). Several studies showed the effects of automatic cognitive bias on cognitive tasks, including the speed of general lexical decisions (Kawakami, Young, and Dovidio 2002), performance on a memory task (Dijksterhuis, Aarts, Bargh, and van Knippenberg 2000), and

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performance on a general knowledge scale (Dijksterhuis and van Knippenberg 1998). More importantly, evidence is growing that implicit cognitive processes impact interpersonal behavior. Anthony Greenwald and Mahzarin Banaji summarize, "stereotypes are often expressed in the behavior of persons who explicitly disavow the stereotype" (1995, p. 16).

A large group of studies found effects of automatic racial bias on non-verbal behaviors, especially on expressions of friendliness toward members of a minority group. John Dovidio et al. (1997) found that Whites' implicit bias measured by response latency predicted differences in nonverbal behaviors, such as blinking and visual contact, in 3-minute interactions with Black vs. White confederates. Another study showed that White participants' automatic racial biases, measured by response latency to positive and negative non-stereotypical words after subliminal priming with Black vs. White faces, significantly correlated with nonverbal friendliness in subsequent interaction with Black and White confederates (Dovidio, Kawakami, and Gaertner 2002). Similalry, Russell Fazio et al. (1995) found that the participants who had been exposed to priming of negative racial bias later behaved in a less friendly manner toward a Black target.

In addition to the decrease of friendliness, the increase of hostility in response to priming of the category "Black" was also found (Fazio, Jackson, Dunton and Williams 1995, Bargh, Chen, and Burrows 1996, Chen and Bargh 1997). John Bargh, Mark Chen and Lara Burrows' (1996) study is among the most influential. The authors examined the effects of subliminal priming with faces on responses to a frustrating "computer error". Participants who had been subliminally exposed to Black faces responded to the "error" with more hostility than participants who had been subliminally exposed to White faces. Similarly, Mark Chen and John Bargh (1997) reported that the subliminal exposure to pictures of Blacks resulted in more hostility in subsequent interactions. Interestingly, the behavior of the interaction partners of

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subjects exposed to Black primes seemed also affected, in the manner of a self-fulfilling prophecy.

Yet another group of studies found the effects of automatic racial bias on verbal behavior and on judgment. Denise Sekaquaptewa and her co-authors al. (2003) studied the participants' explanations for a Black person's behavior. Automatic stereotypes were indicated by the tendency to propose explanations that were congruent with the stereotypes of Blacks. This measure of implicit stereotypes predicted White males' subsequent behavior toward a Black female but it did not predict White males' behavior toward a White male or a White female. Another study found that the judgment of an essay purportedly written by a "Black undergraduate" was more negative among participants with more negative implicitly measured racial attitudes (Jackson 1997).

Interestingly, the evidence for the behavioral consequences of automatic racial bias measured by IAT is generally weaker than the evidence from studies using other measures. One positive result was reported by McConnell and Liebold (2001). In this study, after a brief interaction with a White experimenter, participants took a racial-prejudice IAT and then interacted with a Black experimenter. IAT scores were associated with less speaking time, less smiling, fewer extemporaneous social comments, more speech errors, and more speech hesitations in the interaction with the Black (vs. White) experimenter. IAT scores also predicted the experimenters' and the independent raters' ratings of the subjects' interaction with the Black versus the White experimenter. However, these findings might have been influenced by the fact that the IAT was administered before the interaction with the Black experimenter, possibly increasing the salience of the racial category and causing the activation of racial attitudes.

How does implicit priming affect behavior? Rupert Brown et al. (2003) review two explanations, labeled "direct link" and "indirect link". According to the "direct link"

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explanation, the initial (unconscious) activation of the stereotype in memory spreads and activates a "behavioral schema" associated with that representation. Ap Dijksterhuis and John Bargh (2001) note that this explanation is consistent with James' (1890) "principle of ideomotor action." According to this principle, the activation of a cognitive representation (e.g., stereotype) spreads to connected behavioral representations, increasing the probability of stereotype-congruent behavior. Citing Dijksterhuis and Bargh (2001), Rupert Brown and his co-authors (2003) conclude that there is ample evidence supporting the direct link explanation.

The "indirect link" explanation, on the other hand, assumes that the initial activation of the stereotype influences the perceiver's judgment, which in turn impacts behavior. Brown et al. (2003) illustrate this explanation as follows: the activation of a Black stereotype leads to the activation of a trait, "hostility," as shown by Patricia Devine (1989), which may in turn lead to more aggressive behavior, as shown by John Bargh et al. (1996).

Contextual Effects in Social Cognition

For decades, social scientists have puzzled over the problem of what situations or interventions may help reduce racial/ethnic bias. A fundamental assumption behind these efforts is that social cognitions, including categorization, stereotyping and prejudice, are modifiable rather than fixed. Evidence seems to be converging on the conclusion that stereotypes respond to situations and context, and thus are neither universal nor inevitable (Blair 2002). Some studies in this tradition hypothesized that racial/ethnic stereotyping is more likely to happen when the availability of cognitive resources is low. Importantly, these studies tend to find that cognitive load, time pressure and other forms of stress increase the likelihood of racially or ethnically biased judgment and behavior. It is plausible that by reducing the supply of cognitive resources, such designs also make it more likely that implicit, rather than explicit, racial/ethnic biases will be activated.

One influential study varied the cognitive busyness while exposing the subjects to an Asian (vs. Caucasian) assistant (Gilbert and Hixon 1991). In the first phase of their experiment, subjects watched a videotape in which an Asian or Caucasian assistant showed cards containing fragments of words. Subjects had to generate word completions, such as S_ORT (SHORT). In the high cognitive busyness condition, subjects simultaneously performed this task while rehearsing a digit sequence. In the second phase, subjects listened to the Asian or Caucasian assistant describe a day in her life, and cognitive busyness was varied in a similar way as in the first phase. Finally, subjects had to describe the assistant. Stereotypical descriptions of an Asian assistant were most likely to be given by subjects who were exposed to the Asian assistant while being cognitively busy in the first phase, and who were also cognitively busy in the second phase while listening to the assistant.

Galen Bodenhausen and Meryl Lichtenstein (1987) reported that the complexity of a judgment task was related to the likelihood of using ethnic stereotypes. Subjects read information about a defendant who was portrayed either as Hispanic or ethnically non-descript. When subjects faced a complex judgment situation (they were supposed to judge the defendant's guilt), they judged the Hispanic defendant as more guilty than the nondescript defendant. In a simple judgment task (respondents judged aggressiveness) subject's judgment did not differ by the ethnicity of the defendant.

Margo Monteith and Corrine Voils (1998) examined how people's evaluations of jokes about Blacks vary by cognitive load. In the high cognitive load condition, people were asked to count a number of objects appearing on a screen while the joke was presented. Among people with a high degree of discrepancy between their personal standards of how one should behave toward Blacks and their actual responses to Blacks, the cognitive load increased the positive evaluations of the jokes about Blacks. Among people with a low degree of discrepancy

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between their personal standards of how one should behave toward Blacks and their actual responses, cognitive load did not affect the evaluations of the jokes.

Time pressure and stereotyping were examined in a study that exposed Dutch students to a Turkish or Dutch target (Dijker and Koomenn 1996). The students were also exposed to information about a target that was (a) consistent (b) inconsistent or (c) irrelevant to ethnic stereotypes about the Turks and the Dutch. Under time pressure, students processed the ethnic stereotype-consistent information about an out-group member more easily than stereotype-inconsistent and stereotype-irrelevant information about the out-group member.

Several additional studies showed that other types of stereotypes, beyond those pertaining to race/ethnicity, also respond to stress and cognitive load. In one study, participants were told that they would be a part of a group (Macrae, Hewstone, and Griffiths 1993). In a high cognitive load condition induced by requiring the subjects to simultaneously rehearse an eight-digit number while being presented with information about the fictitious group traits, subjects recalled more stereotypical information about the group than did subjects in the low cognitive load condition. Carsten De Dreu (2003) compared the behavior of students participating in negotiations under high time pressure vs. under low time pressure. Under high time pressure, but not under low time pressure, the students used information about their negotiating partner's major in a stereotypical way, making more demands on religion majors than on business majors. The author concluded that time pressure increased reliance on cognitive heuristics, and reduced the ability and motivation to process information systematically. In a study of physical stress and stereotyping, Hai-Sook Kim and Robert Baron (1988) found that compared to low intensity exercise, subjects who performed high intensity cycling exercise overestimated the frequency of previously presented adjectives that were stereotypical of occupations. Finally, Galen Bodenhausen (1990) reported that at a non-peak level of circadian arousal (the morning for "night people" and in the evening for "morning

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people") subjects' judgments were more influenced by stereotypic biases. Arguably, cognitive functioning was sub-optimal at non-peak circadian times or after physical exertion, and stereotypes helped to economize resources that were scarce at these times.

Another group of studies examined how implicit racial/ethnic bias responds to contextual and situational factors. In one study (Wittenbrink, Judd, and Park 2001), racial/ethnic stimuli were embedded in pictures of a family barbecue vs. a gang incident. Implicit racial and ethnic stereotypes responded to this contextual information. Another study showed that implicit racial/ethnic stereotypes were reduced in a group of students enrolled in a college course on prejudice and conflict (Rudman, Ashmore, and Gary 2001). In another study, automatic stereotype activation was reduced among participants who extensively practiced reversed stereotypic associations (Kawakami et al. 2000). Thinking about admired out-group members (e.g., Tiger Woods or Denzel Washington) and disliked in-group members (i.e., Jeffrey Dahmer or Timothy McVeigh) also reduced automatic anti-Black bias, both immediately and twenty-four hours later (Dasgupta and Greenwald 2001). Finally, internal vs. external motivation to respond without prejudice played a role in automatic affective racial bias measured by blink responses to White and Black faces (Amodio et al. 2003). While none of these studies explicitly examined the effects of cognitive load or stress on implicit racial/ethnic bias, they give an indication that contexts matter for implicit biases. It seems plausible that stress and cognitive load are among such contextual factors, even through direct evidence is not yet available.

Micro-Level Model of Racial/Ethnic Interaction in Concrete Contexts

In this chapter, I reviewed theories of social cognition and evidence from experimental social psychology showing that (a) social cognition, including racial/ethnic categorization, stereotypes and prejudice, is cognitively efficient; (b) cognitive load increases the likelihood that racial/ethnic cognition will be activated and will affect behavior; and (c) racial/ethnic

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cognition is to a large degree automatic (i.e., implicit; unacknowledged). Based on this theoretical understanding, I propose a socio-psychological model of racial/ethnic interaction in concrete contexts:

1. Race/ethnicity of an interaction partner serves as a stimulus that activates the perceiver's cognitive processes linked to the particular racial/ethnic category (i.e., racial/ethnic cognitions).

2. These racial/ethnic cognitions are mainly automatic, i.e., they are not easily accessible to conscious reflection and to conscious efforts to control them.

3. The racial/ethnic cognitions, in turn, shape the perceiver's behaviors toward the interaction partner.

4. Racial/ethnic cognitions attached to minority groups, especially to Blacks, Hispanics, and Native Americans, are mostly negative in content.

5. Therefore, if a perceiver interacts with a person of minority racial/ethnic background, the perceivers' behaviors are affected by racial/ethnic cognitions in ways that tend to disadvantage the minority individual.

6. Racial/ethnic cognitions are cognitively efficient; therefore, the reliance upon them is increased in concrete contexts that create high cognitive load for the perceiver. Such contexts are characterized by conditions such as time pressure, multiple or incompatible tasks demanded at the same time, or other forms of stress.

7. Therefore, when the demands on the perceiver's cognitive resources are high, the perceiver's racial/ethnic cognitions are more likely to give rise to negative behavior toward members of minority racial/ethnic groups than when the demands on the perceiver's cognitive resources are not high.

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CHAPTER 4

APPLYING THE MICRO-LEVEL MODEL OF RACIAL/ETHNIC INTERACTION TO HEALTHCARE CONTEXTS

In Chapter 3, I employed cognitive social psychology to propose a model of racial/ethnic interaction in concrete contexts. Can this model help us understand racial/ethnic disparities in the quality of medical care? This chapter explores its usefulness for understanding how individual physicians and concrete healthcare environments contribute to the lower quality of health care received by some patients of minority racial/ethnic backgrounds. I first review briefly what we know about physicians' contributions to racial/ethnic disparities and what the limitations of this previous research are. Next, I explore the applicability of the model, concluding that the application of this model helps overcome some limitations of previous research on physicians' contributions to racial/ethnic disparities in the quality of medical care.

Thinking the Unthinkable: Do Physicians Contribute to Racial/Ethnic Disparities?

Is an average American physician biased against his or her minority patients? Such a proposition seems unthinkable to many members of the American medical community. In fact, recent studies suggesting that physicians might contribute to racial/ethnic disparities in health care have been followed by reactions of disbelief from the medical community. Yet, the emerging evidence strongly suggests that racial/ethnic cognitions among physicians and other healthcare providers do influence in negative ways the providers' perceptions of patients and compromise the quality of care, at least for some types of care.

A groundbreaking study by Kevin Schulman and his co-authors (1999) revealed differences in medical decisions for cardiac patients who varied in their race and gender. The authors presented physicians attending a professional meeting with videotapes of carefully

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trained Black and White actors who portrayed patients with chest pain that required further diagnostic testing. All "patients" exhibited exactly the same cardiac symptoms and were comparable in their age and in other characteristics, except for their race and gender. Physicians were less likely to recommend cardiac catheterization, a demanding diagnostic procedure, for Black females than for White females, although the likelihood of recommending the procedure for Black and White males did not differ. This study suggests that biases against Black female cardiac patients may be more pronounced than biases against other cardiac patients.

A study by Michelle van Ryn and Jane Burke (2000) showed that physicians' perceptions of their real patient varied by patients' race. The authors asked physicians to rate their patients after coronary angiograms on a number of characteristics. The ratings for White and Black patients were compared. Physicians rated their Black patients as less intelligent, less educated, less likeable, less friendly, less likely to adhere to medical advice, and more likely to engage in risky behavior, such as alcohol and drug use. Importantly, the differences in physicians' perceptions of their White and Black patients persisted even after controlling for patients' sickness, age, depression, social assertiveness and the physician's socio-demographic characteristics, including race. Thus, this study provides convincing evidence that racial/ethnic biases, above and beyond other factors, were responsible for the variation in physicians' perceptions of their patients.

Yet another study showed the association between patients' race and physicians' perceptions of the patients' adherence to medication (Bogart, Kelly, Catz, and Sosman 2000). This study found that physicians evaluated the adherence to a new type of HIV medication among Black HIV-positive men as lower compared to the adherence to the same medication among other HIV-positive patients.

A separate stream of evidence suggesting that healthcare providers' racial/ethnic biases may affect the quality of health care for some minority patients comes from surveys of patients' experience with their health care. One study (La Veist, Rolley, and Diala 2003) found that in a national sample, 23 percent of African Americans and 15 percent of Hispanics reported that they felt they would have received better health care if they were of a different race/ethnicity. Four percent of African Americans and 3 percent of Hispanics reported that they were treated badly in healthcare settings because of their race/ethnicity. This study also found that African Americans and Hispanics were significantly more likely to report racial/ethnic discrimination than others, even after controlling for several socio-demographic variables, i.e., age, income, gender, and subjective health status.

Similarly, a national study by Rachel Johnson and her colleagues (2004) reported that Blacks, Hispanics, and Asians were more likely than Whites to believe that that they would have received better medical care if they belonged to a different racial/ethnic group, even after controlling for age, socioeconomic status, self-rated health status, and source of care. In another model that included communication characteristics and health literacy measures in addition to the same control variables as in the previous model, minority respondents were more likely to report that medical staff judged them unfairly or treated them with disrespect because of their race/ethnicity. Yet another national study showed that Blacks and Latinos were more likely than Whites to say that they, a family member, or a friend have been treated unfairly by a healthcare provider because of their race/ethnicity (Lillie-Blanton et al. 2000). In addition, Latinos were more likely than Whites to say that a healthcare provider judged them unfairly based on how well they spoke English.

Limitations of Previous Research

One limitation to previous research on physicians' contributions to racial/ethnic disparities in the quality of health care is that it has paid little attention to *automatic*

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racial/ethnic cognitions among physicians. While the evidence on automatic biases among physicians is missing, Jose Abreu (1999) examined automatic biases among social workers. Social workers whose automatic racial biases were activated by brief exposure to words reflecting Black stereotypes subsequently evaluated a hypothetical mental health patient of unidentified race as significantly more hostile than social workers who were exposed to neutral words. The results of this study suggest that some healthcare providers' perceptions of patients are affected by automatic racial/ethnic biases. There is a need to investigate the automatic biases among physicians. Physicians differ from social workers and other healthcare providers in several important characteristics (e.g., educational levels, incomes, status and prestige). It is unclear whether Abreu's findings would generalize to the physician population and apply to healthcare providers working with other than mental health patients. More importantly, there is a need to examine how physicians' perceptions, if they are affected by automatic racial/ethnic biases, translate into medical decisions.

Another limitation of previous research is that offers only rudimentary understanding of factors beyond patients' race/ethnicity that contribute to racial/ethnic biases in health care. Yet, *contextual factors* including the types of facility where care is delivered, the organizational and institutional context of the physician-patient encounter, and the geographic area may shape the ways in which cognitive biases are or are not expressed in medical decisions. Previous studies of racial biases among physicians, such as van Ryn and Burke's (2000) and Schulman et al.'s (1999) studies, have used small convenience samples that were typically drawn from a single place or a limited number of healthcare settings. Such samples make it impossible to determine whether the degree of physicians' racial/ethnic biases differs by the types of organizations and institutions in which the physicians deliver medical care.

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Applying the Model of Racial/Ethnic Biases to the Healthcare Settings

Since racial/ethnic cognitions are essentially devices that help simplify a complex social world, they may surface more easily in complex or ambiguous situations, in which it is not immediately clear which course of action would be best. The argument about the cognitive efficiency of racial/ethnic cognitions is consistent with John Dovidio and Samuel Gaertner's (1986) theory of aversive racism, which maintains that people are most likely to discriminate against minorities when clear rules and action guidelines are lacking. In such ambiguous situations, it is easy to rationalize or "explain away" discriminatory acts. An individual who committed an act of discrimination may explain, and even honestly believe, that the discriminatory act was motivated by other reasons than race/ethnicity and that the disadvantage that it created for a minority person was purely accidental.

Medicine is full of inherently ambiguous situations, in which an array of diagnostic and treatment options is available and in which it is unclear what would constitute the best course of action. In ambiguous situations, physicians must use their clinical discretion to make decisions. They must weigh the benefits of each potential medical procedure for the patient against its disadvantages, taking into account potential adverse effects, complications, patients' lifestyle, technical and logistic demands of the procedure, as well as its cost. Some pieces of information that go into most medical decisions are incomplete, inconclusive, or missing. This inherent ambiguity of medicine makes it likely that racial/ethnic biases, *if physicians have them*, will give rise to disadvantaging behaviors when physicians deal with minority patients, especially if the patient's case is unclear, complex, or it requires a great degree of physician discretion.

The cardinal question, then, is: Are physicians, on average, affected by biased racial/ethnic cognitions? While there is emerging empirical evidence in support of this argument, it is important to acknowledge up front some of its problems. Physicians have

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several characteristics that, in studies using general population, have been shown to negatively relate to racial/ethnic biases. First, they are highly educated. Higher education is typically associated with higher awareness of racial/ethnic and other social inequalities. Physicians' medical education also tends to include some information on racism in medicine, including the Tuskegee Study, the medical experimentation on Jews and Gypsies in Nazi Germany, and other such dark legacies. Many physicians have gone through cultural sensitivity training programs that are increasingly offered by medical institutions. In addition, physicians tend to be aware of (and, in many cases, truly committed to) the ethical guidelines of their profession, which stress providing quality care to all patients. These ethical commitments are incompatible with conscious racism. Finally, even those physicians who possess personal racist beliefs may seek to "self-correct" in their behaviors to project an unprejudiced image. Such self-correction in behavior may be motivated by the fear of litigation or may simply happen because being prejudiced is generally considered socially undesirable. Therefore, even among prejudiced physicians, the effect of racial/ethnic biases on their behavior toward patients may be small.

Despite the plausibility of the arguments against the existence of appreciable racial/ethnic biases among most physicians, I maintain that racial/ethnic cognitions among physicians do exist and that they significantly affect the quality of care for minority patients. It seems intuitive that some physicians, like many other individuals living in the American society, will display biases against members of racial/ethnic minority groups. I argue that these biases are not limited to a few exceptional cases; rather, I propose that they are widespread among physicians, even among those who are committed to the principles of social justice and who strive to distribute medical services equitably to all patients regardless of the color of their skin and their ethnic backgrounds. An important qualification to this argument is that I expect the racial/ethnic cognitions among physicians to be mainly *automatic*. The non-

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conscious nature of these cognitions may enable the physicians to maintain a non-prejudiced self-image consistent with their professional ethics.

If physicians have automatic cognitive biases against minority groups, especially Blacks, Hispanics, and Native Americans, then we may expect that once these cognitions are activated in an interaction with a patient of one of these minority backgrounds, the physicians' decision making about diagnosis and treatment will be influenced in ways that disadvantage the minority patient. Stereotypes about non-adherence among Native Americans, for instance, may lead to the decision that a Native American patient is not a good candidate for procedures that require patient compliance and attention to long-term or complex regimens. Thus, the stereotypes about non-adherence may effectively limit the treatment choices that the physicians will offer to a Native American patient. Another example is a stereotype about low socioeconomic status of Blacks, which may contribute to a decision not to recommend to a Black patient treatments that require out-of-pocket co-pays, even if these treatments would be potentially beneficial. Stereotypes about low intelligence or limited language proficiency in some minority groups may result in less communication about the particulars of the patient's condition. The physician may doubt that the patient would understand technical language and complex concepts. If the patient and physician do not communicate effectively, the physician may miss important diagnostic information from or the patient may leave the doctor's office with only incomplete understanding of the recommended treatments. Stereotypes about lower intelligence may also lead physicians to use a more directive approach and to refrain from involving the patient in medical decision making. If shared decision making is absent, the final medical decision may not reflect the patients' preferences and values. In the manner of a self-fulfilling prophecy, a patient who has not participated in the decision making may ultimately not comply with the physician's recommendation.

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Another important qualification is that the adverse impact of physicians' racial/ethnic cognitions on the quality of care for minority patients is likely to be moderated in racially/ethnically concordant physician-patient dyads. Theory of racial aspects of cognitive biases primarily builds on evidence from Black-White interaction. There is no conclusive understanding of how other racial/ethnic combinations play out in terms of the activation of racial/ethnic cognitions. In fact, there is little evidence on the content of implicit racial/ethnic stereotypes held by non-Whites. It is generally assumed that these stereotypes resemble to some degree the stereotypes held by Whites, but it stands to reason that this resemblance is not perfect. In the absence of clear evidence on the content of stereotypes prevalent among minority Americans, it is difficult to predict the effects of a patient's race on medical encounters when the physician is non-White. While racial/ethnic stereotypes, if activated, may result in the biased decisions among physicians of all racial/ethnic backgrounds, in-group preference and out-group derogation can yield biased decisions against minority patients only among White physicians. Hence, it is reasonable to expect that racial/ethnic concordance will, in general, produce beneficial effects for the physician-patient interaction, and may even reduce anti-minority biases in physicians' medical decisions.

Evidence from patients' surveys corroborates this argument, at least to the extent to which patient-reported outcomes, such as patients' satisfaction, reflect physicians' behavior. Several surveys have revealed that racial, ethnic and linguistic concordance positively affect patients' satisfaction with their physicians (LaVeist and Nuru-Jeter 2002), overall patients' ratting of their physicians (Saha et al. 1998) and patients' participation in medical decision making (Cooper-Patrick et al. 1999). Importantly, racial/ethnic concordance also negatively affects patients' perceptions of racial/ethnic bias and discrimination in health care (La Veist, Rolley, and Diala 2003). It seems that when given a choice, patients gravitate toward physicians of their own race/ethnicity. LaVeist and Nuru-Jeter (2002) report that patients who

have a choice in their selection of a physician are more likely to be in racially concordant physician-patient relationships than patients who have little choice. On the large scale, however, racial/ethnic concordance may have a limited role in ameliorating biases against minority patients. Even though minority physicians are more likely than White physicians to serve minority populations (Saha et al. 1998), minority patients are still more likely to see a racially discordant physician, mainly because the under-representation of minorities among American physicians. In one national study, less than 22 percent of African-American patients reported having African-American physicians (LaVeist and Carroll 2002). Thus, in-group preference and out-group derogation on the part of physicians would more commonly disadvantage minority patients than White patients.

Healthcare Contexts, Physician's Stress, and Racial/Ethnic Cognitions

Healthcare providers do not interact with their patients in a vacuum. Physician-patient interactions are embedded in healthcare contexts that vary widely in their characteristics. These varying characteristics include the types of the practice in which the health care is delivered, the financial, technical, and administrative resources available to physicians, the types of insurers that the physicians or healthcare organizations contract with, the degree to which the healthcare organization adopted the managed care model, the use of performance-based incentives to control physician's practice patterns, the physicians' professional autonomy, the use of practice guidelines, the time pressure and administrative demands placed on physicians, and racial/ethnic compositions of the physicians and patients in the organization. Such characteristics of healthcare contexts shape physician-patient interactions in important ways (Grembowski, Cook, Patrick, and Roussel 2002).

Why is the attention to the organizational and institutional characteristics important in the study of racial/ethnic disparities in health care? I argue that characteristics of healthcare contexts may affect the ways in which medical care is delivered to White vs. non-White

patients. To the extent to which these characteristics affect *physicians' stress levels,* contexts of health care may moderate the degree to which the care received by White patients differs from the care received by patients of disadvantaged racial/ethnic backgrounds. In the model of racial/ethnic biases in contexts that I proposed in Chapter 3, stress levels increase the likelihood that racial/ethnic biases will be activated and used. Cognitive biases serve to save cognitive resources by simplifying complex situations that contribute to the experience of stress. Therefore, I argue that under stress, physicians may be more likely to use racial/ethnic biases as cognitive shortcuts that simplify the complexity of their environment and allow them to more quickly and easily arrive at a medical decision.

In addition, stress may exacerbate racial/ethnic disparities in health care by hampering the conscious efforts to fight stereotypes. Some physicians may be aware of their own stereotypes and strive to overcome them by making decisions in an unprejudiced way. Yet, efforts to overcome one's own biases require substantial cognitive resources in order to be successful. Free cognitive resources required to overcome one's own biases may not be available in stressful environments that already tax a person's cognitive resources to the fullest. In one experimental study, the success with which individuals were able to suppress unwanted thoughts was positively related to working memory capacity (Brewin and Beaton 2002).[6] Under stress, working memory capacity may be reduced. For physicians working under stress, cognitive resources needed for the conscious suppression of biases may not be available, since their cognitive resources are fully engaged in dealing with time pressures and distractions, and in processing complex information involved in the medical decision.

Which characteristics of healthcare contexts are likely to contribute to physicians' stress? Studies employing direct physiological measures of physician stress are rare but several

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[6] Working memory capacity reflects the capacity for focused attention in the face of distractions (Rosen and Engle 1998).

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studies have used surveys or interviews to examine perceived stress and career satisfaction among physicians. Arguably, characteristics of healthcare contexts that lower physicians' career satisfaction may also be the ones that increase physicians' stress. Perceived time pressure is a strong negative correlate of career satisfaction and potentially one of the most important stressors in a physician's work environment. Among other potential stressors, there are inadequate financial or technical resources, inadequate administrative support, low degrees of professional autonomy, conflicts of interest, dissatisfied or non-compliant patients, fear of malpractice suits, and poor professional relationships.

Edith Gross (1994) conducted in-depth interviews with 24 American cardiologists and 21 British cardiologists about their working lives. Physicians were asked: "What do you find to be the major strains and stresses in your work as a physician?" High workload, limits on autonomy, the lack of resources, time demands, and role conflict were among major sources of perceived stress. British physicians ranked high workload and the lack of resources first among their work-related strains. American physicians, in contrast, ranked the restrictions of their autonomy first. They were vociferous about the frustration they experienced when third parties interfere with their medical decision-making. The following quote by an American cardiologist is illustrative:

> "Every once in a while I get called by a third party asking why a patient has to be sent down for cardiac catheterization or why you want to do this or do that... It is very frustrating that they call you. Everything just takes more time, taking care of the paperwork, rather than the patients" (p. 24).

A related source of frustration came from utilization review by organizations that impose negative sanctions if the physician's practices do not conform to their pre-defined criteria. The need to defend their own practice patterns, often to non-experts, resulted in physicians' anger and resentment. One American cardiologist said:

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"How would you like to be an individual who has spent 13 to 14 years in training with advanced degrees and with board certification in both internal medicine and in cardiology and have to justify the continued stay of a patient in a hospital to a clerk in an insurance company who knows absolutely nothing about medicine?" (p. 25)

Gross' (1994) results may to some degree reflect the specialty of the physicians she interviewed. They may or may not apply to physicians who do not practice cardiology. There is some indication that the types of stressful experiences vary by specialty. Grace Budrys (1993), for instance, found variation according to specialty in physicians' experience with gatekeeping. She conducted semi-structured interviews with 41 physicians of various specialties practicing in one of the largest health maintenance organization (HMO) in the western United States. While some physicians viewed gatekeeping, i.e., a requirement that a physician authorizes access to specialist services, as generally beneficial for efficient and cost-effective care (possibly an effect of the self-selection of physicians with favorable attitudes toward healthcare rationing into this organization), gatekeeping was also a source of stressful experiences. The frustration with gatekeeping was the greatest among physicians carrying the greatest gatekeeping burden, namely among primary care practitioners. These physicians had to say "No" to patients a lot and expressed concerns about the implications gatekeeping had for the quality of care and for the quality of the patient-physician relationships. The toll that gatekeeping sometimes takes on the satisfaction of patients who wished they could receive more care and on the relations with the patients in general was particularly troubling to the interviewed physicians.

Burdys' interviews indicated that psychiatrists are another group commonly stressed by gatekeeping. Some psychiatrists indicated that the stress connected to gatekeeping is not limited to the lack of rewarding relationships with patients, but sometimes takes a much more immediate and severe form. Because of organizational directives, psychiatrists sometimes had to limit continuing care, even though such care was clearly indicated. These physicians were

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directly exposed to the frustration of patients and their families, without having any recourse to the organization that imposed the limits on care. Budrys writes: "Since the organization did not negotiate on this matter, the psychiatrists had to face the patients' pleas, anger, and whatever else on their own" (Burdys 1993, p. 361).

Gatekeeping and utilization review are cost-containment strategies commonly found in healthcare organizations that use the managed care model. *Managed care* is "a set of activities that health plans and others can undertake to mitigate the propensity for the provision of more and more expensive services fostered by unmonitored heavily insured fee-for-service medicine" (Baker 2003, p. 438). The goal of managed care has been to contain rising healthcare costs while providing adequate medical care. Unfortunately, the strategies that these organizations use to contain costs tend to be stressful for physicians (Stoddard, Hagraves, Reed, and Vratil 2001, Sturm 2002, Linzer et al. 2000), since they place physicians into the role of a person responsible for healthcare expenditures that is often at odds with the more traditional physician roles of an expert healer.

Elaine Draper (2003) casts the managed care physicians' experience in the broader context of corporatization of medical care. Based on interviews with "company doctors", executives and attorneys, Draper elaborates that doctors working for large medical care companies often express a distressing conflict between their patients' medical care needs and the corporate oversight. The author concludes that the conflicting demands of being both a corporate employee and an autonomous professional constitute a social and structural problem rather than a problem of individual ethics. The increased stress level for individual doctors seems to be a consequence of this structural problem.

In large survey studies, physicians express concerns about the impact of managed care, including administrative pressures, pressures to limit referrals, and pressures to see more patients per day, on the availability and quality of services (Grumbach, Osmond, Vranizan,

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Jaffe, and Bindman 1998). In surveys, perceived time pressure tends to be higher for physicians who work under managed care than for physicians who work in other types of settings (Sturm 2002, Reschovsky, Reed, Blumenthal, and Landon 2001, Linzer et al. 2000). Physicians working for organizations using managed care strategies are less likely to agree that they have adequate time to spend with their patients during typical office outpatient visits and hat they need more time than allotted for new patients. Incentives to limit services and increased administrative demands may be especially detrimental to physicians' job satisfaction (Schifrin, Jacobs, Romans, Cruess, and Kelly 2001). Physicians who perceive strong incentives to limit their services are more likely to be dissatisfied with their practice, and report that their expectations regarding practicing medicine, including time with patients, ordering tests, and ordering procedures, are not met (Hadley, Mitchell, Sulmasy, and Bloche 1999).

Importantly, managed care organizations have curbed physicians' autonomy. Many require that the physicians obtain pre-approval for procedures from the utilization review organization and use detailed formularies of approved pharmaceutical products for which the insurance will pay. In addition, some financial arrangements used in managed care put providers at risk for the financial implications of the patient care decisions they make. Examples of such arrangements include payment by capitation and withholding a portion of the payments until the end of the year, and distributing them based on whether or not the physician group met utilization and quality goals. Some physicians may experience a conflict between their desire to give patients access to best possible services and the pressure to control this access, decreasing the cost of care.

Obviously, there are other contextual factors other than managed care policies that increase physicians' job-related stress. Physicians who treat patients with life-threatening conditions requiring a quick physicians' response may also experience chronically elevated stress levels. These types of patients are often treated in trauma departments, intensive care

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units or in surgery departments. In such highly stressful environments and situations, physicians' cognitive biases may serve as cognitive shortcuts that free much needed cognitive recourses for quick responses. While the relationship between physicians' stress and racially/ethnically biased medical decisions has not, to my knowledge, been investigated, there is some evidence on the high prevalence of racial/ethnic disparities in emergency departments. In a study of the authorization of healthcare services in an urban emergency department, Blacks were, on average, nearly 50 percent more likely to be denied authorization for emergency medical care services than Whites, even after controlling for their triage scores, gender, age, type of managed care organization, and other factors (Lowe et al. 2001). The authors of this study explain that Black patients were denied services mainly because their problems were considered "non-urgent" or "minor". While this study does not establish the mechanisms leading to the high rates of denial of services for Blacks, it provides evidence on pronounced racial/ethnic disparities in a stressful medical environment.

Model of Racial/Ethnic Interaction in Healthcare Contexts

Exploration of the utility of the micro-level model of racial/ethnic interaction for healthcare contexts (especially for physician-patient interactions) suggests that the model does apply in this context and that its application overcomes several limitations of previous research on the sources of racial/ethnic disparities in health care. First, my model explicitly includes physicians' automatic racial/ethnic biases. Second, this model addresses stress as one contextual factor that may shape physician's racial/ethnic biases. By including physician's stress, this model is able to predict some circumstances that shape the ways in which racial/ethnic biases are or are not expressed in medical decisions, and has implication for a variety of organizational and institutional settings in which physicians work. The application of the conceptual model of racial/ethnic interaction to high and low stress healthcare settings is illustrated in Figure 4.1.

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Figure 4.1. Conceptual model of micro-level mechanisms in racial/ethnic interaction in high-stress and low-stress healthcare settings.

Low stress settings:

race/ethnicity ——▶ racial/ethnic cognitions——▶ medical decisions ——▶ quality of care

High stress settings:

race/ethnicity══▶racial/ethnic cognitions ══▶ medical decisions ——▶ quality of care

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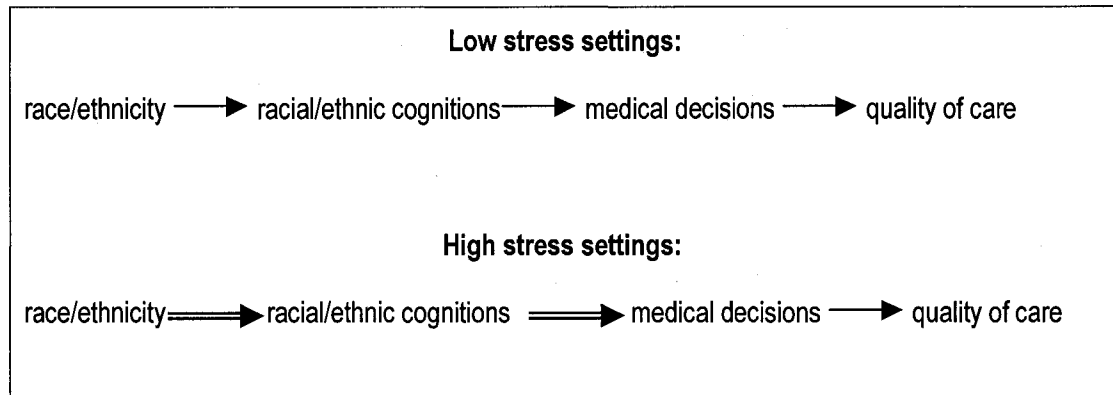
The relationship between race/ethnicity and racial/ethnic cognitions indicates that the patient's race/ethnicity serves as a stimulus that activates the physician's cognitive processes attached to the patient's racial/ethnic category, i.e., racial/ethnic cognitions. My model does not specify whether racial/ethnic cognitions activated by patient's race/ethnicity are implicit or explicit, allowing for both of these possibilities. However, it can be expected that a major role in racial/ethnic disparities in played by automatic cognitions, which are not easily accessible to physicians' conscious reflection and to conscious effort to control them.

The second arrow from the left depicts the relationship between racial/ethnic cognitions and medical decisions. Racial/ethnic cognitions shape physicians' medical decisions and other physicians' behaviors, which, in turn are reflected in the quality of care (as depicted by the third arrow). Social cognitions attached to minority racial/ethnic groups, especially to Blacks, Hispanics, and Native Americans, are mostly negative in content. Therefore, if a physician interacts with a patient with a minority racial/ethnic background, the medical decisions about diagnosis and treatment are affected by racial/ethnic cognitions in ways that tend to result in a disadvantage for the minority patient. Some potential outcomes of such interactions include the denial of services, spending less time with the patient, not recommending a full array of

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treatment and diagnostic options, or not explaining the health condition or recommendations thoroughly to the patient, among others.

Racial/ethnic cognitions are cognitively efficient; therefore, the reliance upon them increases in concrete contexts that create high cognitive load for the physician. These contexts are characterized by conditions such as time pressure, multiple or incompatible tasks demanded at the same time, or other forms of stress. Stressful contexts may include organizations that use stressful managed care policies, trauma departments, intensive care units, and situations that require quick responses from physicians. Under conditions of stress, when the demands on the physicians' cognitive resources are high, the physicians' racial/ethnic cognitions are more commonly activated and are more likely to give rise to medical decisions disadvantaging members of minority racial/ethnic groups than when the demands on the physicians' cognitive resources are not high. This argument is illustrated by the use of double arrows in the part of Figure 4.1 that pertains to high stress settings.

General Hypotheses

In this section, I derive general research hypotheses using the model of micro-level mechanisms in racial/ethnic interaction in health care proposed above. The model argues that patients' race/ethnicity activates the physicians' racial/ethnic cognitions, including categorization, stereotyping, and bias. The physicians' racial/ethnic cognitions influence how the physician interacts with the patient and what medical decisions the physician makes. Racial/ethnic cognition may lead some physician to provide a poorer quality of technical and interpersonal care to their minority patients, especially to Blacks and Hispanics. Based on these arguments, I posit the following general research hypotheses:

H1. *Ceteris paribus, Blacks receive poorer quality of health care than Whites.*

H2. *Ceteris paribus, Hispanics receive poorer quality of health care than Whites.*

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H3. *Ceteris paribus, members of non-Black, non-Hispanic minority groups receive poorer quality of health care than Whites.*

Furthermore, the model proposed in the previous chapter specified that physicians' racial/ethnic cognitions are more likely to influence the quality of health care when a physician is under high stress than when a physician is under low stress. This aspect of the model is reflected in the second set of hypotheses, which can be written in two alternative ways. The first alternative emphasizes the variation in the magnitudes of racial/ethnic differences:

H4a. *Ceteris paribus, the magnitude of Black-White difference in the quality of health care varies positively with the level of physician stress.*

H5a. *Ceteris paribus, the magnitude of Hispanic-White difference in the quality of health care varies positively with the level of physician stress.*

H6a. *Ceteris paribus, the magnitude of the difference in the quality of health care between for Whites and for non-Black, non-Hispanic minority individuals varies positively with the level of physician stress.*

The second alternative emphasizes the stress-related variation in the presence and absence of racial/ethnic differences:

H4b. *Ceteris paribus, Black-White differences in the quality of health care exist only when physicians experience high levels of stress.*

H5b. *Ceteris paribus, Hispanic-White differences in the quality of health exist only when physicians experience high levels of stress.*

H6b. *Ceteris paribus, the differences in the quality of health care between Whites and non-Black, non-Hispanic minority individuals exist only when physicians experience high levels of stress.*

In earlier sections of this chapter, I reviewed evidence indicating that that the levels of physician stress increase in healthcare contexts that use policies to contain healthcare costs,

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especially in managed care contexts. (Chapter 5 deals in more detail with conceptualizing managed care in terms of cost-containment insurance policies). Hypotheses H7, H8, and H9, which are contingent on the assumption of a positive relationship between physician stress and managed care, can be formulated as follows:

H7a. *Ceteris paribus, the magnitude of Black-White differences in the quality of health care is larger when cost-containment policies are used than when cost-containment policies are not used.*

H8a. *Ceteris paribus, the magnitude of Hispanic-White differences in the quality of health care is larger when cost-containment policies are used than when cost-containment policies are not used.*

H9a. *Ceteris paribus, the magnitude of the difference in the quality of health care between Whites and non-Black, non-Hispanic minority individuals is larger when cost-containment policies are used than when cost-containment policies are not used.*

An alternative formulation follows:

H4b. *Ceteris paribus, Black-White differences in the quality of health care exist only when cost-containment policies are used.*

H5b. *Ceteris paribus, Hispanic-White differences in the quality of health exist only when cost-containment policies are used.*

H6b. *Ceteris paribus, the differences in the quality of health care between for Whites and for non-Black, non-Hispanic minority individuals in the quality of health care exist only when cost-containment policies are used.*

To evaluate these hypotheses, I designed two empirical studies. The first study, reported in Chapter 5, tests the "real world" implications of the model as reflected in the specific formulations of hypotheses H1-H3 and H7-H9 that concern patients' evaluations of the quality of their primary care. The second study, reported in Chapter 6, is an experiment designed to

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get a better handle on the causal mechanisms underpinning the proposed model, especially as they pertain to racial/ethnic cognitions. Its goal is to test specific formulations of hypotheses H1-H6.

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CHAPTER 5

DO MANAGED CARE POLICIES WIDEN RACIAL/ETHNIC GAPS IN PATIENTS' EVALUATIONS OF THE QUALITY OF HEALTH CARE? SURVEY STUDY[7]

The goal of this study is to test hypotheses H1, H2, H3, H7, H8, and H9 with national survey data. These hypotheses specify how race/ethnicity affects the quality of care. In this study, I focus on one specific aspect of healthcare quality: *patients' evaluations of the quality of care provided by their primary care physicians*. Patients' evaluations of the quality of care are an important indicator of the overall quality of care, and they have been used widely in healthcare research (e.g., Andersen, Giachello, and Aday 1986, Blendon, Aiken and Corey 1989, Forrest, Shi, von Schrader, and Ng 2002, Phillips, Mayer, and Aday 2000, Shi 2000).

The general hypotheses H1, H2, and H3 can be written in more specific terms to reflect the focus of this study on patients' evaluations of the quality of care provided by primary physicians. The more specific formulation follows:

H1.1 *Ceteris paribus, Black patients evaluate the quality of care provided by their primary care physicians as poorer than do White patients.*

H2.1 *Ceteris paribus, Hispanic patients evaluate the quality of care provided by their primary care physicians as poorer than do White patients.*

H3.1 *Ceteris paribus, non-Black, non-Hispanic minority patients evaluate the quality of care provided by their primary care physicians as poorer than do White patients.*

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[7] A previous version of study appeared in *Medical Care* (Stepanikova and Cook 2004, copyright owner Lippincott Williams & Wilkins). I conceived of and designed the study, conducted the literature review, performed the statistical analysis, interpreted the results and wrote the first and several subsequent drafts of the manuscript. Professor Karen Cook performed several rounds of critical revisions of the manuscript and participated in writing the theory and conclusions.

Hypotheses H7, H8, and H9 can be written in two alternative ways. The first alternative emphasizes the differences in the *magnitudes* of racial/ethnic disparities in the quality of health care by the use of cost-containment policies:

H7.1a *Ceteris paribus, the magnitude of Black-White differences in the patients' evaluations of the quality of care provided by their primary care physicians is larger when cost-containment policies are used than when cost-containment policies are not used.*

H8.1a *Ceteris paribus, the magnitude of Hispanic-White differences in the patients' evaluations of the quality of care provided by their primary care physicians is larger when cost-containment policies are used than when cost-containment policies are not used.*

H9.1a *Ceteris paribus, the magnitude of differences between Whites' and non-Black, non-Hispanic minority patients' evaluations of the quality of care provided by their primary care physicians is larger when cost-containment policies are used than when cost-containment policies are not used.*

The second alternative emphasizes *the pattern of presence and absence* of racial/ethnic disparities in the quality of health care by the use of cost-containment policies:

H7.1b *Ceteris paribus, Black-White differences in the patients' evaluations of the quality of care provided by their primary care physicians exist only when cost-containment policies are used.*

H8.1b *Ceteris paribus, Hispanic-White differences in the patients' evaluations of the quality of care provided by their primary care physicians exist only when cost-containment policies are used.*

H9.1b *Ceteris paribus, differences between Whites' and non-Black, non-Hispanic minority patients' evaluations of the quality of care provided by their primary care physicians exist only when cost-containment policies are used.*

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Previous Research on Managed Care and Racial/Ethnic Disparities

The role of managed care in racial/ethnic disparities in patients' evaluations of primary care is not well understood. Several studies have addressed how *gatekeeping*, a commonly used managed care strategy, influences racial inequalities in healthcare *access and utilization* (Schneider, Cleary, Zaslavsky and Epstein 2001, Phillips, Fernyak, Potosky, Schauffler and Egorin 2000, Haas, Phillips, Sonneborn, McCulloch and Liang 2002, Hargraves, Cunningham and Hughes 2001). In general, these studies show either no effect or a positive effect of managed care on healthcare access for some minority groups. Less is known about the influence of gatekeeping on the experiences of those who have gained entry into the healthcare system. No studies, to my knowledge, have assessed the role of *capitation*, another common feature of managed care plans, in racial/ethnic inequalities in patients' perceptions of the quality of their care.

In addition, the interpretation of the findings from the few prior studies examining managed care and racial disparities in perceived quality is difficult because of methodological complications. One such complications is that much of the prior research on managed care defines managed care using broad categories of insurance plans, such as health maintenance organization (HMO), point of service (PPO), fee for service (FFS), and others. While such broad categories were adequate in the past, they may no longer accurately describe the reality of the rapidly evolving American healthcare markets. The organizational complexity among health insurance plans has been growing at a rapid pace. Insurance plans within each broad category do not necessarily use identical cost-control strategies, while similar strategies may be used across categories. Some newer types of plans share features of more than one of the broad categories (Landon, Wilson, and Cleary 1998, Brach et al. 2000), experiment with tiered provider networks and consumer product upgrades, or replace older managed care policies, such as capitation, with newer types of cost-control, such as financial incentives for efficiency

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and quality (Lesser and Ginsburg 2003). Hence, the use of broad categories to define managed care might obscure important variation within each category.

An example is a study of the relationship between managed care and patients' evaluations of care (Phillips, Mayer, and Aday 2000), in which managed care participants in this study are defined as persons who indicate that they are in an HMO, purchased insurance from an HMO or have an insurance plan requiring a sign-up with a primary care physician, clinic or organization for routine care. The results indicate that among Hispanics, but not among other racial and ethnic groups, managed care patients' evaluations of their usual physicians' listening and providing information differ from non-managed care patients' evaluations. Managed care patients' confidence in their physicians' ability to help with medical problems differs significantly from non-managed care patients' confidence only among Hispanics and Whites, but not among other groups. Satisfaction with the usual physician is associated with managed care among Asian Americans, Whites, and Hispanics, but not among Blacks. Unfortunately, the conceptualization of managed care confounds a broad category (i.e., HMO) and a specific cost-containment policy (i.e., requirement to sign up with a primary care provider). Hence, this study leaves unclear which policies are actually responsible for the reported managed care effects. The interpretation of the findings of this study is further complicated by the fact that the analyses do not control for possible confounding factors.

More detailed measurements of managed care are used in a study with parents of pediatric patients in Southern California (Stevens and Shi 2002). The authors consider several specific policies, including the requirement to select a provider from a panel, the requirement for a referral to see a specialist, and financial restrictions on seeing a provider out of the network. When managed care policies are present, minority parents, but not White parents, report poorer relationships between their children and the healthcare providers compared to when managed care policies are absent.

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Another study using a national sample of adults (Forrest, Shi, von Schrader, and Ng 2002) finds that neither the requirement to select a primary care provider (PCP) nor the requirement that the PCP authorizes referrals affect the magnitude of disparities in an index composed of patients' evaluations of trust in the provider, the provider's communication skills, and the provider's competence. In contrast, access to health care and continuity with a healthcare provider reduce racial/ethnic disparities. One limitation of this study is the use of patient reports of insurance policies. These measures may be biased since patients tend to have limited knowledge of their healthcare plans (Marquis 1983, Isaacs 1996, Ryan et al. 1998). Another limitation is the lack of adjustment for linguistic abilities. Limited English proficiency may be partially responsible for the effects associated with ethnicity, especially for Hispanics.

Conceptualizing Managed Care

My conceptualization of managed care seeks to address some limitations of previous research that relied on broad categories of insurance plans. To better capture the aspects of organizational contexts that matter in the delivery of healthcare services, I use a conceptual framework suggested by David Grembowski and his co-authors (2000). Grembowski advocates breaking down managed care into discrete insurance policies designed to control healthcare costs. Using Grembowski's approach enables me to clarify the role of the components of managed care and to determine whether some managed care strategies create more negative outcomes for minorities than others. I focus on two specific cost-containment strategies commonly used by managed care plans: capitation and gatekeeping.

Capitation is a method of payment that some managed care plans use to compensate healthcare providers. Under capitation, the provider receives a fixed fee per patient, usually on an annual basis, regardless of the services provided. Capitation is designed to control healthcare cost by transferring the financial risk for providing healthcare services to physicians. John Scoggin, an economist, explains that "by accepting capitated (i.e., fixed per

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patient) fees, practitioners incur the insurance risk of providing health services to patients. Therefore practitioners who operate under capitated-fee agreements pocket any income that is made available by general reductions in expenditures" (2002, p. 49).

Gatetekeeping is an arrangement in which physicians (usually PCP's) oversee all the services that each patient receives, both in the primary care settings and in other settings, such as specialized care or hospitals. The physician who serves as a gatekeeper receives incentives to keep down the overall costs for the healthcare services. To accomplish this goal, many managed care plans require the patients to sigh up with a contracted PCP who will ration their healthcare services. Moreover, in many managed care plans, the PCP who serves as a gatekeeper must authorize referrals before patients can receive insurance coverage for specialist visits or hospital care. Since specialty services and hospital services tend to be costly, gatekeepers receive incentives that dissuade them from providing the referral. David Lawrence (2001) explains that in traditional gatekeeping arrangements, "a financial risk pool was created for each primary care physician, and every time a patient was referred to a specialist, the pool was depleted by an amount that was proportionate to the cost of the referral." While many managed care plans abandoned such arrangements, they still require the authorization of referrals by PCP's who are offered some form of incentives to limit the referrals.

Methods

Data and Sample

The data come from the 1998-1999 wave of the Community Tracking Study (CTS) Household Survey and Followback Survey 1998-2000 (Center for Studying Health System Change 2001a). The survey is an initiative of the Robert Wood Johnson Foundation designed to track changes in health care. The Household Survey used a representative sample of the non-institutionalized civilians living in forty-eight contiguous states. Stratified sampling with probabilities proportionate to the general population of the United States yielded a sample of

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51 metropolitan and 9 non-metropolitan sites. Sites included metropolitan statistical areas (MSA's) and non-metropolitan sites. MSA's were defined by the United States Office of Management and Budget. Non-metropolitan sites were areas contiguous with metropolitan statistical areas and sites clustered around economic centers too small to be designated as metropolitan statistical areas. Most sites were counties or clusters of counties. Sites were stratified by region and by their size (large metropolitan sites ≥200,000 persons, small metropolitan sites <200,000 persons, and non-metropolitan sites). Twelve of these 60 sites were randomly selected from MSA sites with populations of 200,000 or more as case study sites. CTS conducted visits to these sites designed to gain in-depth understanding of these selected healthcare markets. These visits involved discussions of the healthcare system changes with local representatives of employers, government, consumer groups, hospitals, physician groups, and health plans.

Household-level interviews were conducted with 58,956 household members living in the 60 selected communities. A majority of households were selected by random-digit dialing (RDD). The sample also included households without telephones or with interruptions in telephone service during the survey year that lasted two weeks or longer. In addition, a supplemental national sample of households was included to increase the precision of national estimates. This supplemental sample was selected by RRD and closely approximated simple random sampling nationwide. Interviews were conducted by telephone or in person for respondents without telephones. Respondents selected English or Spanish as the language of the interview. Interviews included questions about respondents' health status, risk behaviors, health insurance coverage, healthcare use, access to care, satisfaction with care, perceived quality of health care, and socio-demographic characteristics. The questions about the quality of care were only asked of adults aged 18 years or more who saw a physician at least once

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during the past 12 months and had a check-up or visit for sickness. A detailed description of sampling procedures and survey methodology can be found in the CTS User Guide.

The Followback Survey queried healthcare plans, employers or other organizations administering health insurance for privately insured respondents to the CTS Household Survey. Information about healthcare coverage was obtained for 21,074 respondents and 15,496 of them were queried about the quality and continuity of care. I limit the sample to 7,213 adults whose last physician visit was a primary care visit. The CTS dataset contains information on the PCP's payment methods and on the PCP's gatekeeping role. Selecting only primary care visits enables me to directly link the patients' evaluations of care to the policies affecting the physician who delivered the care.

Dependent Variables

Patients' Evaluations of the Quality of Primary Care. I measure two aspects of patients' evaluations of the quality of care they received during the last visit to their PCP: the physician's explaining skills and the physician's thoroughness. Respondents were instructed to think about their last visit to a physician and answer the following questions: (1) "How would you rate the thoroughness and carefulness of the examination and treatment you received?" and (2) "How would you rate how well the doctor explained things to you in a way you could understand?" Responses had the following categories: 1="poor," 2="fair," 3="good," 4="very good," and 5="excellent."

Explanatory Variables

Patients' Race, Ethnicity, and Language of Interview. Race/ethnicity of the interviewed patients is coded in the CTS into four categories: non-Hispanic White, non-Hispanic Black, Hispanic, and other minority. The last category, referred to in this study as non-Black, non-Hispanic minority, contains Asian Americans, Native Americans, and Pacific Islander but the CTS does not provide individual-level information about these more specific racial/ethnic

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categories. To account for linguistic abilities, I further distinguish between Hispanics who chose to take the interview in Spanish and Hispanics who chose to take the interview in English. The language of interview serves as a proxy for English proficiency.

Insurance Policies. Measures of insurance policies are obtained from patients' insurers, employers, and other administrators of healthcare plans, not from patients. This is an important advantage of my measures. Measurement relying on patients' reports of insurance is subject to bias since it is influenced by the level of patients' knowledge about their healthcare plans, which is typically poor (Marquis 1983, Isaacs 1996, Ryan et al. 1998).

The measure of capitation reflects the typical method of payment for primary care services. I code this measure as (1) capitation, including combined, "professional", or "global" capitation and (0) for all others, including fee for service, fixed fee schedule, and salaried by an organization.

Two variables are used to measure gatekeeping. A dichotomous variable indicates whether the insurer requires patients to sign up with a PCP. The second dichotomous variable indicates whether a referral or authorization is required to obtain maximum coverage for initial visits to in-network specialists.

Control Variables

The control variables are selected to reflect factors that, according to previous research, play a role in patients' experiences with health care and in racial/ethnic disparities (see Andersen and Newman 1993, Blendon et al. 1989, Ford, Bearman, and Moody 1999, King and Williams 1995, Smedley et al. 2002, Weissman and Epstein 1994).

Sociodemographic Characteristics. Several authors pointed out socioeconomic factors as common confounders in analyses of racial and ethnic differences in health care (see, for instance, King and Williams, 1995 for discussion of race and socioeconomic status). Years of education are bottom-coded at 6 and top-coded at 19. Annual household income is top coded at

$150,000. I also include a dichotomous indicator of whether the household met the U.S. Census Bureau definition of poverty when interviewed.

Other sociodemographic variables include respondents' gender and age in years (top-coded by CTS at 91). Mental and physical health status indicators are derived from the SF-12 Physical and Mental Component Summary Scores, calculated using the Health Institute's scoring algorithm (Ware, Kosinski, and Keller 1995). Factors influencing availability of healthcare facilities are Census geographical division (New England, Mid-Atlantic, East North Central, West North Central, South Atlantic East South Central, West South Central, Mountain, and Pacific),[8] and a dichotomous indicator for living in a metropolitan area.

Characteristics of Health Care. This set of control variables includes the setting where care is usually obtained (doctor's office, HMO, hospital outpatient clinic, other clinic or health center, hospital emergency room, and other place) and a measure of continuity of care, constructed as a binary variable coded as 1 if the respondent indicated that (a) he/she has a usual source of health care, (b) knows what type of a provider they usually see, and (c) usually sees the same provider each time, and coded 0 for respondents who do not meet all three conditions. For frequency of utilization of care, I include a variable representing the number of physician visits during 12 months preceding the interview (top-coded at 30).

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[8]Middle Atlantic Census Division: New Jersey, New York, and Pennsylvania. New England Census Division includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. East North Central Census Division: Illinois, Indiana, Michigan, Ohio, and Wisconsin. West North Central Census Division: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota. East South Central Census Division: Alabama, Kentucky, Mississippi, and Tennessee. South Atlantic Census Division: Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia. West South Central Census Division: Arkansas, Louisiana, Oklahoma, and Texas. Mountain Census Division: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming. Pacific Census Division: Alaska, California, Hawaii, Oregon and Washington.

Analytic Strategy

All analyses were conducted using SUDAAN statistical software (Research Triangle Institute 2002) to correctly account for sampling weights and design effects in data with multistage, stratified cluster sampling.[9] According to the CTS user Guide, SUDAAN is the only statistical software on the market at the time of the writing of this dissertation that appropriately calculates variances in CTS datasets.

I first estimate univariate and bivariate statistics. Next, I estimate a series of linear regression models for the two dependent variables representing patients' evaluations of the quality of their primary care, using the Taylor series method of variance estimation. These estimators are suitable for complex survey data (Binder 1983).[10] The independent variables in the regression models include race/ethnicity, insurance strategies, and their interactions, as well as the control variables described in the previous section.

Results

Table 5.1 includes estimates of means and standard errors of the dependent and independent variables for the whole sample and by racial/ethnic/language groups, adjusted for the complex sampling design to represent the national population. The final sample includes 79 percent non-Hispanic Whites, 10 percent non-Hispanic Blacks, 2 percent Hispanics interviewed in Spanish, 6 percent Hispanics interviewed in English, and 4 percent non-Black,

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[9] The programming statements adjusting for complex sampling are consistent with those specified in the CTS User guide.

[10] I also estimated cumulative logistic regression models using the Taylor series method of variance estimation and robust standard errors under the assumption of independence of working correlations. Cumulative logistic regression is a SUDAAN procedure for modeling ordered categorical dependent variables. It models cumulative probability up to and including category k, where k, k=1,...,K are ordered response categories for the dependent variable. The results did not differ substantially from the regression results. Since the interpretation of cumulative logistic regression results is cumbersome, especially as concerns predicted values, I only report the results of the linear regression models here.

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non-Hispanic minority individuals (i.e., Asians, Pacific Islanders, Native Americans and Alaska Natives).

The table further shows the results of bivariate analyses comparing each minority racial/ethnic/language category to non-Hispanic Whites. Minority patients consistently rate their PCP's explaining skills and thoroughness more negatively than do non-Hispanic Whites. Compared to non-Hispanic Whites, non Black, non-Hispanic minority individuals and Hispanics who were interviewed in Spanish are more likely to be enrolled in plans paying their PCP's by capitation. Hispanics interviewed in English and members of non-Black, non-Hispanic minority groups are more likely than non-Hispanic Whites to be enrolled in insurance plans that use capitation. Non-Hispanic Blacks and Hispanics interviewed in English are more likely than Whites to have insurance plans requiring that they sign up with a PCP. Non-Hispanic Blacks are also more likely to have insurance plans requiring that the PCP authorize a referral to specialist before full coverage for specialist care can be obtained. All racial/ethnic minority groups are less likely than Whites to have had their last physician visits in doctors' offices, as opposed to other settings, such as community clinics or emergency rooms. Non-Hispanic Blacks and Hispanics interviewed in English are more likely than Whites to have had their last physician visit in outpatient clinics.

The results of bivariate analyses of sociodemographic characteristics by race/ethnicity/language generally conform to the well-known patterns of poorer health and socio-economic disadvantage among the racial/ethnic minorities living in the United States. Compared to Whites, Blacks have poorer physical health and Hispanics interviewed in English have poorer mental health. Blacks and Hispanics interviewed in Spanish have lower education and household income than do Whites. Hispanics interviewed in English have lower incomes than do Whites. Blacks and Hispanics interviewed in Spanish are more likely than Whites to live in impoverished households.

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Table 5.1. Means and standard errors (in parentheses) for the variables used in subsequent analysis for the whole sample and by race/ethnicity/language.

	Non-Hispanic Black (N=698)	Hispanic, Spanish Interview (N=122)	Hispanic, English Interview (N=437)	Non-Black, Non-Hispanic Minority (N=267)	Non-Hispanic White (N=5,689)	All (N=7,213)
Patients' Evaluations						
How well physician explained	4.01 (.04)*	3.56 (.07)***	3.99 (.11)*	3.69 (.05)***	4.07 (.01)	4.02 (.01)
How thorough physician was	3.83 (.04)*	3.45 (.07)***	3.79 (.11)*	3.57 (.06)***	3.96 (.02)	3.90 (.02)
Insurance Strategies						
PCP capitated	.28	.51	.45[†]	.36[†]	.27	.29
PCP sign up required	.67[†]	.68	.70[††]	.62	.60	.62
Referral required	.67[††]	.64	.65	.64	.61	.59
Characteristics of Care						
Usual place of care						
HMO	.09	.06	.09	.11	.08	.08
Physician's office	.67[†††]	.62[†]	.70[†]	.66[†]	.78	.75
Outpatient clinic	.11[†††]	.05	.07[†]	.06	.03	.04
Other clinic	.10	.27[†]	.12	.14	.10	.11
ER	.01	.00	.01	.01	.005	.004
Other place	.005	.00	.02	.02	.01	.01
Usually sees same provider	.88	.87	.85	.86	.87	.87
No. of visits in past year[a]	4.40 (.19)	4.27 (.35)	4.10 (.22)	3.84 (.22)	4.11 (.07)	4.3 (.06)

Source: Community Tracking Study Household Survey 1998-1999 and Followback Survey 1999-2000.
Notes: Estimates are weighted and adjusted for complex sampling. PCP=primary care provider [a] Top-coded var. [b] Bottom-coded var.
T-tests for difference in means comparing each racial/ethnic group to Whites: * p<.05 ** p<.01 *** p<.001
Chi-square test for independence comparing each racial/ethnic group to Whites: [†] p<.05 [††] p<.01 [†††] p<.001

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Table 5.1 continued. Means and standard errors (in parentheses) for the variables used in subsequent analysis for the whole sample and by race/ethnicity/language.

	Non-Hispanic Black (N=698)	Hispanic, Spanish Interview (N=122)	Hispanic, English Interview (N=437)	Non-Black, Non-Hispanic Minority (N=267)	Non-Hispanic White (N=5,689)	All (N=7,213)
Sociodemographic Variables						
Physical health index	49.83 (.31)***	49.99 (.87)	51.19 (.47)	50.74 (.47)	51.35 (.13)	51.11 (.11)
Mental health index	53.27 (.36)	50.88 (1.11)	51.19 (.46)**	52.18 (.58)	52.74 (.11)	52.62 (.10)
Age (years)[a]	40.24 (.52)	38.10 (1.67)	37.15 (.61)***	39.74 (.75)	40.90 (.17)	40.43 (.16)
Education (years)[ab]	13.46 (.08)***	10.73 (.60)***	13.67 (.15)	14.31 (.16)	14.04 (.04)	13.87 (.04)
Household income ($10,000s)[a]	5.04 (.18)***	4.13 (.35)***	5.63 (.20)**	6.78 (.26)	6.42 (.08)	6.17 (.07)
Household below poverty	.05[††]	.10[†]	.04	.01	.02	.03
Female	.56[†]	.55	.54	.49	.51	.52
Urban	.99	.98	.99	.99	.99	.99
Census division						
Middle Atlantic	.13	.07	.16	.13	.16	.16
New England	.04	.10	.04	.06	.11	.10
East North Central	.14	.10	.07	.14	.22	.21
West North Central	.01	.001[††]	.01	.01	.02	.02
East South Central	.01	.001[†]	.002[†††]	.01	.01	.01
South Atlantic	.28[†]	.24	.19	.11[†]	.15	.17
West South Central	.12[††]	.04	.10	.05	.08	.08
Mountain	.04[†]	.14	.14[†]	.05	.07	.07
Pacific	.04[†††]	.38	.27	.40[†††]	.18	.19

Source: Community Tracking Study Household Survey 1998-1999 and Followback Survey 1999-2000.

Notes: Estimates are weighted and adjusted for complex sampling. PCP=primary care provider [a] Top-coded var. [b] Bottom-coded var.
T-tests for difference in means comparing each racial/ethnic group to Whites: * p<.05 ** p<.01 *** p<.001
Chi-square test for independence comparing each racial/ethnic group to Whites: [†] p<.05 [††] p<.01 [†††] p<.001

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Tables 5.2 and 5.3 display results of multivariate linear regression models of the effects of patients' race/ethnicity/language and insurance policies on patients' evaluations of care, used to test hypotheses about poorer evaluations of care by minorities as compared to non-Hispanic Whites, along with the hypotheses about the variation of the magnitudes of racial/ethnic/language-based disparities according to insurance policies. Table 5.2 contains the results of models of the dependent variable that reflects patients' evaluations of how well the physician explained the information during the last visit. Model 1, which contains only the main effects, indicates that non-Hispanic Black patients evaluate their primary care physicians' explanations during their last visit less favorably than do White patients. This result provides support for Hypothesis H1.1. Hypothesis H2.1 that Hispanic patients evaluate the quality of care provided by their primary care physicians as poorer than do White patients receives support for Hispanics interviewed in Spanish, but not for Hispanics interviewed in English, whose evaluations of their physicians' explaining skills do not differ from Whites' evaluations. Finally, non-Black, non-Hispanic minority individuals rate their physicians' explaining skills lower than do Whites. This result provides support for Hypothesis H3.1 that non-Black, non-Hispanic minority patients evaluate the quality of care provided by their primary care physicians as poorer than do White patients.

The examination of the effects of control variables in Model 1 (Table 5.2) reveals that capitation is associated with more negative evaluations of the physician's explaining skills. The number of visits in the last year, usually seeing the same healthcare provider, physical and mental health, age, and being female are associated with more positive evaluations of the physician's explaining skills. Residents of New England give more positive evaluations of the physician's explaining compared to residents of the Middle Atlantic region. In contrast, residents of the East South Central region rate their physician's explaining more negatively than do the residents of the Middle Atlantic region.

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Table 5.2. Estimates of unstandardized coefficients in linear regression models of how well the physician explained.

	Model 1	Model 2	Model 3	Model 4
Race/Ethnicity[a]				
Non-Hispanic Black	-.09[†]	-.12**	-.07	-.10
Hispanic (Spanish interview)	-.41[†††]	-.39*	-.29	-.34
Hispanic (English interview)	-.08	.09	.11	.12
Non-Black, non-Hispanic minority	-.37[†††]	-.36***	-.20*	-.24**
Insurance Strategies				
PCP capitated	-.10**	-.07	-.09*	-.09*
PCP sign up required	-.08	-.08	-.05	-.09*
Referral required	-.02	-.02	-.02	.01
Characteristics of Care				
Usual place of care [b]				
HMO	-.09	-.10	-.10	-.10
Outpatient clinic	.03	.03	.03	.04
Other clinic	-.07	-.08	-.07	-.07
ER	.35	.35	.36	.34
Other place	-.12	-.12	-.12	-.13
Usually sees same provider	.33***	.33***	.33***	.33***
Number of visits in past year [d]	.02***	.02***	.02***	.02***
Sociodemographic Factors				
Physical health index	.01***	.01***	.01***	.01***
Mental health index	.02***	.01***	.01***	.01***
Age (years)[d]	.01***	.01***	.01***	.01***
Education (years)[de]	.01	.01	.01	.01
Female	.08***	.08***	.09***	.09***
Household income ($10,000s)[d]	.003	.003	.003	.003
Household below poverty	-.05	-.06	-.05	-.05
Urban area	-.14	-.13	-.15	-.15

Source: Community Tracking Study Household Survey 1998-1999 and Followback Survey 1999-2000. N=7,213.

Notes: Estimates are weighted and adjusted for complex sampling. PCP=primary care provider [a] Reference category is Non-Hispanic White [b] Reference category is physician's office [c] Reference category is Middle Atlantic [d] Top-coded variable [e] Bottom-coded variable
One tail tests: [†] p<.05 [††] p<.01 [†††] p<.001
Two-tailed tests: * p<.05 ** p<.01 *** p<.001

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Table 5.2 continued. Estimates of unstandardized coefficients in linear regression models of how well the physician explained.

	Model 1	Model 2	Model 3	Model 4
Census division[c]				
New England	.12*	.12*	.12*	.12*
East North Central	.02	.03	.02	.02
West North Central	-.06	-.06	-.06	-.06
East South Central	-.27***	-.26***	-.26***	-.27***
South Atlantic	-.06	-.05	-.05	-.06
West South Central	.004	.01	.004	.003
Mountain	-.08	-.08	-.09	-.09
Pacific	-.05	-.04	-.05	-.05
Interactions				
PCP capitated * Non-Hispanic Black		.09		
PCP capitated * Hispanic (Spanish interview)		-.05		
PCP capitated * Hispanic (English interview)		-.41†††		
PCP capitated * Non-Black, non-Hispanic minority		-.04		
PCP sign up required * Non-Hispanic Black			-.04	
PCP sign up required * Hispanic (Span. interview)			-.17	
PCP sign up required * Hispanic (Engl. interview)			-.28††	
PCP sign up required * Non-Black, non-Hispanic minority			-.28†	
Referral required * Non-Hispanic Black				.01
Referral required * Hispanic (Spanish interview)				-.11
Referral required * Hispanic (English interview)				-.31††
Referral required * Non-Black, non-Hispanic minority				-.21†
Intercept	2.72***	2.32***	2.32***	2.31***
R-square	.07	.08	.08	.08

Source: Community Tracking Study Household Survey 1998-1999 and Followback Survey 1999-2000. N=7,213.

Notes: Estimates are weighted and adjusted for complex sampling. PCP=primary care provider [a] Reference category is Non-Hispanic White [b] Reference category is physician's office [c] Reference category is Middle Atlantic [d] Top-coded variable [e] Bottom-coded variable
One tail tests: [†] p<.05 [††] p<.01 [†††] p<.001
Two-tailed tests: * p<.05 ** p<.01 *** p<.001

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Formal testing of hypotheses H7.1a, H8.1a, and H9.1a was performed by estimating the interactions between each insurance policy and each racial/ethnic/language group. Performing tests of statistical significance for the estimates of interaction effects enables me to compare the magnitudes of gaps between non-Hispanic Whites and each racial/ethnic minority group under various insurance policies. Model 2 in Table 5.2 tests the interactions between race/ethnicity/language and capitation. Model 3 Table 5.2 tests the interactions between race/ethnicity/language and the requirement to sign up with a PCP. Model 4 in Table 5.2 tests the interactions between race/ethnicity/language and the requirement to obtain a referral in order to get full coverage of specialist care.

In all three interaction models of how well the physician explained, I find significant interactions between managed care policies and being Hispanic interviewed in English. These results indicate that the difference between the evaluations of physicians' explaining skills by Hispanics interviewed in English and by non-Hispanic Whites is larger when the managed care policies are used than when these policies are not used. Specifically, Model 2 reveals that the evaluations of physicians' explaining skills given by Hispanics interviewed in English are more dissimilar from those given by non-Hispanic Whites when capitation is used than when capitation is not used. In Model 3, the evaluations of physicians' explaining by Hispanics interviewed in English are more dissimilar from evaluations given by non-Hispanic Whites when patients are required to sign up with a PCP than when there is no such requirement. In Model 4, the evaluations of physicians' explaining by Hispanics interviewed in English are more dissimilar from evaluations given by non-Hispanic Whites in plans requiring a PCP authorization of referrals compared to plans that do not have such a requirement. In addition, there is a significant interaction between the requirement that a PCP authorizes referrals and being a Non-Black, non-Hispanic minority, indicating that non-Black, non-Hispanic minority

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patients' evaluations of physicians' explaining are more dissimilar from non-Hispanic Whites' evaluations when the referral requirement is used than when this requirement is not used.

These results support hypothesis H8.1a for Hispanics interviewed in English for all three of the examined managed care policies, i.e., capitation, the requirement to sign up with a PCP, and the requirement to obtain a referral for specialized care. Furthermore, results support hypothesis H9.1a for one out of the three examined managed care policies, namely, for the requirement to sign up with a PCP. However, no significant interactions were obtained for Blacks, which means that hypothesis H7.1a fails to receive support.

Table 5.3 shows results of multivariate linear regression models of patients' evaluations of how thorough the physician was during the last visit. The pattern of results is similar to those for the evaluations of how well the physician explained. In Model 1, non-Hispanic Black patients and non-Black non-Hispanic minority patients give significantly lower evaluations of their physicians' thoroughness compared to non-Hispanic White patients. These results support hypotheses H1.1 and H3.1. Hypothesis H2.1 that Hispanics evaluate the quality of care provided by their primary care physicians as poorer than do non-Hispanic Whites receives support for Hispanic interviewed in Spanish but not for Hispanics interviewed in English.

Capitation and the requirement for a sign-up with a PCP are negatively associated with the evaluations of the physician's thoroughness. The number of physician visits in the last year, usually seeing the same provider, physical and mental health, age, and being female are associated with more positive evaluations of the physician's thoroughness. People who usually obtain their care in "other clinic or health canter"[11] rate physicians' thoroughness more negatively compared to those who usually obtain their care in doctor' offices. Residents of

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[11] Response options to the question about where the respondents usually obtain their care included a doctor's office (the reference category), an HMO, a hospital outpatient clinic, some other clinic or health center, an emergency room, and some other place.

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West North Central, East South Central, and Pacific regions rate their doctor' thoroughness less favorably compared to residents of the Middle Atlantic region.

Models 2, 3 and 4 in Table 5.3 contain interaction terms between insurance policies and racial/ethnic/language groups. The interaction between being Hispanic interviewed in English and managed care insurance policies are negative and significant in all the three models. These interactions indicate that the gaps between Hispanics interviewed in English and non-Hispanic Whites are larger in insurance plans that use managed care policies, including capitation, the requirement to sign up with a PCP, and the requirement to obtain a referral, compared to other plans. These results provide support for Hypothesis H8.1a for Hispanics interviewed in English but not for Hispanics interviewed in Spanish. No significant interactions were obtained for non-Hispanic Blacks or for non-Black, non-Hispanic minority groups. Therefore, hypotheses H7.1a and H9.1a receive no support in the models of patients' evaluations of physicians' thoroughness.

To better understand how the magnitudes of racial/ethnic/language-based gaps vary with the insurance policies, I calculated predicted values of the two variables representing the patients' evaluations of the quality of care, i.e., the evaluations of the physician's explaining skills and evaluations of the physician's thoroughness. The predicted values are based on the results of the multivariate linear regression models, and correspond to thirty scenarios representing different combinations of insurance policies (managed care vs. non-managed care) and racial/ethnic/language groups.

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Table 5.3. Estimates of unstandardized coefficients in linear regression models of how thorough the physician was.

	Model 1	Model 2	Model 3	Model 4
Race/Ethnicity[a]				
Non-Hispanic Black	-.14[††]	-.13[†]	-.14	-.16
Hispanic (Spanish interview)	-.38[†††]	-.36[†]	-.33	-.44*
Hispanic (English interview)	-.06	.09	.11	.11
Non-Black, non-Hispanic minority	-.32[†††]	-.34[†††]	-.23	-.24*
Insurance Strategies				
PCP capitated	-.08*	-.04	-.07*	-.07*
PCP sign up required	-.13*	-.13*	-.11*	-.13*
Referral required	.01	.01	.01	.03
Characteristics of Care				
Usual place of care[b]				
HMO	-.04	-.05	-.04	-.04
Outpatient clinic	.09	.09	.09	.09
Other clinic	-.11*	-.12*	-.12*	-.12*
ER	.36	.35	.36	.35
Other place	-.08	-.07	-.08	-.09
Usually sees same provider	.26***	.26***	.26***	.26***
Number of visits in past year[d]	.02***	.02***	.02***	.02***
Sociodemographic Factors				
Physical health index	.01**	.01***	.01**	.01**
Mental health index	.02***	.02***	.02***	.02***
Age (years)[d]	.01***	.01***	.01***	.01***
Education (years)[de]	-.01	-.01	-.01	-.01
Female	.10***	.10***	.10***	.10***
Household income ($10,000s)[d]	.003	.003	.002	.003
Household below poverty	-.10	-.10	-.09	-.09
Urban area	.11	.12	.10	.11

Source: Community Tracking Study Household Survey 1998-1999 and Followback Survey 1999-2000. N=7,213.

Notes: Estimates are weighted and adjusted for complex sampling. PCP=primary care provider [a] Reference category is Non-Hispanic White [b] Reference category is physician's office [c] Reference category is Middle Atlantic [d] Top-coded variable [e] Bottom-coded variable One tail tests: [†] p<.05 [††] p<.01 [†††] p<.001
Two-tailed tests: * p<.05 ** p<.01 *** p<.001

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Table 5.3 continued. Estimates of unstandardized coefficients in linear regression models of how thorough the physician was.

	Model 1	Model 2	Model 3	Model 4
Census division [c]				
New England	.06	.06	.06	.06
East North Central	.03	.03	.03	.03
West North Central	-.18*	-.18	-.18*	-.18*
East South Central	-.16*	-.15*	-.15*	-.15*
South Atlantic	-.05	-.04	-.05	-.05
West South Central	-.02	-.02	-.02	-.02
Mountain	-.10	-.09	-.10	-.10
Pacific	-.11*	-.10*	-.11*	-.11*
Interactions				
PCP capitated * Non-Hispanic Black		-.03		
PCP capitated * Hispanic (Spanish interview)		-.06		
PCP capitated * Hispanic (English interview)		$-.35^{\dagger\dagger}$		
PCP capitated * Non-Black, non-Hispanic minority		.03		
PCP sign up required * Non-Hispanic Black			.01	
PCP sign up required * Hispanic (Span. interview)			-.09	
PCP sign up required * Hispanic (Engl. interview)			$-.24^{\dagger}$	
PCP sign up required * Non-Black, non-Hispanic minority			-.15	
Referral required * Non-Hispanic Black				.03
Referral required * Hispanic (Spanish interview)				.08
Referral required * Hispanic (English interview)				-.26*
Referral required * Non-Black, non-Hispanic minority				-.14
Intercept	2.57***	2.18***	2.19***	2.18***
R-square	.07	.08	.08	.08

Source: Community Tracking Study Household Survey 1998-1999 and Followback Survey 1999-2000. N=7,213.

Notes: Estimates are weighted and adjusted for complex sampling. PCP=primary care provider [a] Reference category is Non-Hispanic White [b] Reference category is physician's office [c] Reference category is Middle Atlantic [d] Top-coded variable [e] Bottom-coded variable
One tail tests: † p<.05 †† p<.01 ††† p<.001
Two-tailed tests: * p<.05 ** p<.01 *** p<.001

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The scenarios include the following combinations: (1) Non-Hispanic Black, PCP capitated; (2) Hispanics interviewed in Spanish, PCP capitated; (3) Hispanics interviewed in English, PCP capitated; (4) Non-Black, non-Hispanic minority, PCP capitated; (5) Non-Hispanics White, PCP capitated; (6) Non-Hispanics Black, PCP not capitated; (7) Hispanics interviewed in Spanish, PCP not capitated; (8) Hispanics interviewed in English, PCP not capitated; (9) Non-Black, non-Hispanic minority, PCP not capitated; (10) Non-Hispanics White, PCP not capitated; (11) Non-Hispanics Black, sign-up with a PCP required; (12) Hispanic interviewed in Spanish, sign-up with a PCP required; (13) Hispanic interviewed in English, sign-up with a PCP required; (14) Non-Black, non-Hispanic minority, sign-up with a PCP required; (15) Non-Hispanics White, sign-up with a PCP required; (16) Non-Hispanics Black, sign-up with a PCP not required; (17) Hispanic interviewed in Spanish, sign-up with a PCP not required; (18) Hispanic interviewed in English, sign-up with a PCP not required; (19) Non-Black, non-Hispanic minority, sign-up with a PCP not required; (20) Non-Hispanics White, sign-up with a PCP not required; (21) Non-Hispanics Black, referral required; (22) Hispanic interviewed in Spanish, referral required; (23) Hispanic interviewed in English, referral required; (24) Non-Black, non-Hispanic minority, referral required; (25) Non-Hispanics White, referral required; (26) Non-Hispanics Black, referral not required; (27) Hispanic interviewed in Spanish, referral not required; (28) Hispanic interviewed in English, referral not required; (29) Non-Black, non-Hispanic minority, referral not required; and (30) Non-Hispanics White, referral not required.

The predicted values for each of these scenarios appear in Table 5.4 and Table 5.5. These tables also contain the results of statistical tests comparing each racial/ethnic/language minority group to non-Hispanic Whites for each insurance policy. Twenty-four such tests were performed for how well the physician explained and twenty-four additional tests were performed for how thorough the physician was. Such multiple comparisons cause

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methodological concerns because they inflate the probability of Type I error. Therefore, it was necessary to statistically control for multiple comparisons. To accomplish this goal, I applied the false discovery rate (FDR) correction method proposed by Benjamini and Hochberg (1995, 2000). The FDR represents an expected proportion of erroneously rejected hypotheses among all rejected hypotheses. In studies with a medium to large number of statistical tests, the FDR method has non-trivially greater power than more commonly used methods adjusting for a family-wise error rate, such as the Bonferroni correction method. The FDR correction method is especially appropriate for the condition of multiple tests under dependency and for the condition of many-to-one comparisons, such as comparing several minority groups to Whites (Benjamini and Yekutieli 2001). Both of these conditions exist in this study. I calculated the FDR p-value adjustments using the R programming environment.[12]

Table 5.4 shows the predicted values for how well the physician explained, conditional on other variables in the model, along with the FDR-adjusted statistical tests that compare each racial/ethnic/language minority group to Whites. These tests are performed individually for each managed care and non-managed care scenario and used to formally evaluate hypotheses H7b, H8b, and H9b. The first row in Table 5.4 shows that compared to Whites, Blacks give lower evaluations of how well the physician explained only when capitation is *not* used. Their evaluations do not differ from Whites' in any managed care scenarios. Consequently, hypothesis H7b, which proposes that Black-White disparities in the quality of care exist only when managed care cost-containment strategies are used but not otherwise, receives no support.

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[12] R: A programming environment for data analysis and graphics. Version 1.8.0 (2003-10-08). http://www.r-project.org.

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Table 5.4. Predicted values[a] for patients' evaluations of how well the physician explained[b] by insurance policies and by race/ethnicity/language.

	PCP capitated?		PCP sign up required?		Referral required for maximum benefits?	
	NO	YES	NO	YES	NO	YES
Black	4.01*	4.03	4.07	3.98	4.00	4.02
Hispanic (Spanish interview)	3.74	3.61*	3.84	3.62**	3.76	3.66**
Hispanic (English interview)	4.22	3.74**	4.24	3.92*	4.21	3.92*
Non-Black, non-Hisp. minority	3.76***	3.66*	3.94	3.61***	3.86*	3.66***
White	4.13	4.06	4.14	4.09	4.10	4.11

Source: Community Tracking Study Household Survey 1998-1999 and Followback Survey 1999-2000. N=7,217.

Notes: [a]Based on multivariate regression models of the effects of race/ethnicity/language, managed care policies and their interactions. The models control for education, annual family income, poverty, gender, age, physical and mental health status, number of physician visits during the past year, the place where care is usually obtained, Census division, and living in an urban area; weighted and adjusted for complex sampling. [b]Range=1-5.

T-tests for differences in means comparing each minority racial/ethnic group to Whites for each insurance policy: * p<.05   ** p<.01   *** p<.001

P-values are adjusted for multiple comparisons using the false discovery rate method.

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The next two rows enable me to evaluate hypothesis H8b, which posits that Hispanic-White disparities in the quality of care exist only when managed care cost-containment strategies are used but not otherwise. This hypothesis receives full support for all three examined managed care policies. Hypothesis H9b, which argues that disparities between Whites and non-Hispanic, non-Black minority groups exist when managed care cost-containment policies are used but not otherwise, receives support for the managed care policy that requires patients to sign up with a primary care provider. A pattern consistent with this hypothesis is not evident for the remaining two managed care policies.

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Table 5.5 shows the predicted values for how thorough the physician was, conditional on other variables in the model, along with the FDR-adjusted statistical tests that compare each racial/ethnic minority group to Whites. Compared to Whites, Blacks evaluate their physician's thoroughness lower when a sign-up with a PCP is required but not when a sign-up with a PCP is not required. This result supports hypothesis H7b. However, this hypothesis does not receive support for the remaining two managed care policies, i.e., capitation and referral requirement. Hypothesis H8b receives support for Hispanics interviewed in Spanish for all three types of managed care policies. For Hispanics interviewed in English, the support for this hypothesis is limited to capitation. Compared to Whites, Hispanics interviewed in English evaluate their physicians' thoroughness lower when capitation is used but not when capitation is not used. Finally, Hypothesis H9b receives support for two out of the three examined managed care policies. Significant disparities in the evaluation of physicians' thoroughness between Whites and non-Hispanic, non-Black minority groups exist when gatekeeping policies are used, but not otherwise. However, a similar pattern is not evident for capitation.

Discussion

The purpose of this study was to formally evaluate two sets of hypotheses. The first set of hypotheses proposes that Blacks, Hispanics, and non-Black, non-Hispanic minority persons (i.e., Asians, Native Americans, Alaska Natives, and Pacific Islanders) evaluate the quality of the care they received during their last visit to their primary care physician less favorably than do White patients. The results of this study provide strong support for these hypotheses for non-Hispanic Blacks, Hispanics interviewed in Spanish and members of non-Black, non-Hispanic minority groups.

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Table 5.5. Predicted values[a] for patients' evaluations of how thorough the physician was[b] by insurance policies and by race/ethnicity/language.

	PCP capitated?		PCP sign up required?		Referral required for maximum benefits?	
	NO	YES	NO	YES	NO	YES
Black	3.83	3.75	3.87	3.77*	3.76	3.83
Hispanic (Spanish interview)	3.59	3.49*	3.68	3.49**	3.49	3.60*
Hispanic (English interview)	4.05	3.66*	4.12	3.77	4.03	3.81
Non-Black, non-Hisp. minority	3.62***	3.61*	3.78	3.52***	3.69	3.58***
White	3.96	3.92	4.01	3.90	3.92	3.96

Source: Community Tracking Study Household Survey 1998-1999 and Followback Survey 1999-2000. N=7,217.

Notes: [a]Based on multivariate regression models of the effects of race/ethnicity/language, managed care policies and their interactions. The models control for education, annual family income, poverty, gender, age, physical and mental health status, number of physician visits during the past year, the place where care is usually obtained, Census division, and living in an urban area; weighted and adjusted for complex sampling. [b]Range=1-5.

T-tests for differences in means comparing each minority racial/ethnic group to Whites for each insurance policy: * p<.05   ** p<.01   *** p<.001

P-values are adjusted for multiple comparisons using the false discovery rate method.

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These results are consistent with previous research, which generally shows that minority patients have worse experiences with the quality of their health care than do White patients. This study extends previous research on racial/ethnic disparities in health care by applying a more rigorous methodology. While some of the prior research applied controls for socioeconomic status, insurance, health, and other socio-demographic factors, my study also controls for other factors potentially playing a role in disparities, mainly insurance policies that constitute the context of the physician-patient encounter. I find that even after these more rigorous controls are applied, racial/ethnic disparities in patients' evaluations in health care tend to persist.

The next set of hypotheses evaluated in this study posits that the magnitude of the relationship between patients' race/ethnicity and the quality of care varies by insurance policies, with the policies used to contain cost, commonly implemented by managed care plans, increasing the magnitudes of racial/ethnic disparities. To test these hypotheses, I examined whether the relationship between race/ethnicity and the patients' evaluations of the quality of care vary between plans using managed care policies, i.e., capitation and gatekeeping, and plans not using these policies. I obtained limited support for two out of the three hypotheses. The support for hypothesis H8.1a is limited to Hispanics interviewed in English. There are significant positive effects of all three managed care policies (i.e., capitation, requirement to sign up with a PCP and a requirement to obtain a referral) on the magnitudes of differences between evaluations of the physicians' thoroughness and explaining given by Hispanics interviewed in English and those given by non-Hispanic Whites. The support for hypothesis H9.1a, which concerns the magnitudes of differences between Whites' and non-Black, non-Hispanic minorities' evaluations of care, receives support for one of the two dependent variables (i.e., physicians' explaining skills) and for two out of the three examined managed care policies (i.e., the requirement to sign up with a PCP and the requirement to get authorization of a referral). Hypothesis H7.1a, which contrasts the magnitudes of differences between non-Hispanic Blacks' and non-Hispanic Whites' evaluations of care in managed care and non-managed care plans is not supported in this study.

The pattern of the results was generally consistent with hypotheses H7.1b, H8.1b, and H9.1b, which stress the pattern of *the presence or absence* of racial/ethnic/language-based disparities. They propose that these disparities exist only in managed care settings but not in non-managed care settings. Hypothesis H7.1b received support for evaluations of physicians' thoroughness under one managed care policy. Compared to Whites, Blacks evaluated their physicians' thoroughness lower when a sign-up with a PCP was required but not when a sign-

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up with a PCP was not required. Hypothesis H8.1b received full support for the evaluations of the physician's explanations, since Hispanic-White disparities in the patients' evaluations of how well the physician explained existed only when managed care cost-containment strategies were used but not when these policies were not used. Regarding the evaluations of the physician's thoroughness, hypothesis H8.1b obtained full support for Hispanics interviewed in Spanish and partial support for Hispanics interviewed in English, who evaluated physicians' thoroughness lower than did Whites when capitation was used but not when capitation was not used. Finally, Hypothesis H9.1b, which argued that disparities between Whites and non-Hispanic, non-Black minority groups existed only when managed care cost-containment strategies were used, received support for gatekeeping, but not for capitation.

These results are strongly suggestive that racial/ethnic disparities in the quality of care occur more commonly when managed care policies are used than when these policies are not used. This pattern becomes clearer if we compare the total number of significant racial/ethnic disparities found for managed care scenarios to those found for non-managed care scenarios. Since there are four racial/ethnic/language minority groups, we can find a minimum of zero and a maximum of four significant differences between a minority group and non-Hispanic Whites, for each insurance policy. Given that three managed care policies are examined in this study, we can find a minimum of zero and a maximum of twelve significant differences between a racial/ethnic/language minority group and non-Hispanic Whites in managed care scenarios. Similarly, since there are three non-managed care policies, we can find a minimum of zero and a maximum of twelve significant differences between a racial/ethnic language minority group and non-Hispanic Whites in non-managed care scenarios.

As Table 5.4 indicated, compared to non-Hispanic White patients, minority patients gave lower evaluations of their physicians' explaining skills *in nine out of the twelve managed care scenarios*. Racial/ethnic disparities exist for all non-Black minority groups in plans that

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use any of the three examined managed care policies. In other words, in plans that use capitation, the requirement to sign up with a PCP, or the referral requirement, Hispanics (regardless of the language of the interview) and non-Black, non-Hispanic minority individuals evaluate their physicians' explaining lower than do Whites. In contrast, significant differences between White patients' and minority patients' evaluations of how well the physician explained exist only in *four out of the twelve non-managed care scenarios*. These significant differences exist for non-Black, non-Hispanic minority patients across non-managed care policies and for Black patients in plans that do not use capitation.

This general pattern is even more pronounced for the evaluations of the physician's thoroughness. Significant racial/ethnic/language-based disparities in patients' evaluations of how thorough the physician was exist in *eight out of the twelve managed care scenarios* but only in *one out of the twelve non-managed care scenarios*. Hispanics interviewed in Spanish and non-Black, non-Hispanic minority individuals rate their physicians' thoroughness less favorably than do Whites under capitation, when a sign-up with a PCP is required and when an authorization of a referral is required. Blacks rate their physicians' thoroughness less favorably than do Whites when a sign-up is required. Hispanics interviewed in English rate the same aspect of their care less favorably than do Whites when capitation is used. In contrast, there is only a single significant racial/ethnic difference among the twelve non-managed care scenarios. In plans that do not use capitation, Non-Black, non-Hispanic minority individuals evaluate their physician's thoroughness lower than do Whites.

To summarize, the results show that for Hispanics interviewed in English, the magnitudes of disparities in the quality of care tend to be larger in managed care plans than in other plans. For Hispanics interviewed in Spanish and for members of non-Black, non-Hispanic minority groups, disparities tend to occur more commonly under managed care than under non-managed care. However, this pattern of elevated risk for disparities under managed

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care does not extend to Blacks, who evaluate their care lower than do non-Hispanic Whites overall, but their evaluations tend not to vary according to managed care vs. non-managed care insurance policies. In one instance, Blacks evaluate the physician's explaining lower than do Whites in non-capitated plans, but not in capitated plans, reversing the general pattern evident for other racial/ethnic groups. This result suggests that even though for most minority groups, managed care policies are associated with elevated risk of significantly poorer quality of care compared to Whites, Blacks are an exception to this pattern, since their evaluations of care tend not to differ by gatekeeping, and, for one aspect of the quality of care (i.e., evaluations of explaining), they are *higher* in capitated plans compared to non-capitated plans. It is not known why this reversal of the general pattern occurs for Blacks. Further investigation is needed to unpack its causes.

It is important to note the limitations of this study. First, because of the sampling frame used for collecting CTS data, my investigation is limited to privately insured adults who have received health care during the past 12 months. The results are not generalizable to public healthcare plans and to populations outside the healthcare system not currently receiving medical care. Such populations may include increasingly vulnerable groups, such as the uninsured, the homeless, and the impoverished. If these groups receive care, it is likely that their evaluations of their care differ substantially from the evaluations of care reported by patients in this study.

Second, I concentrate on primary care. It is unknown whether or not the results of this research apply to specialty visits. Third, the race/ethnicity coding system used in the CTS dataset precludes the assessment of potential differences between members of distinct non-Black, non-Hispanic minority groups, including Asians, Pacific Islanders, and Native Americans. While the results suggest that racial/ethnic disparities in the evaluations of care exist at least for some of these groups, we do not know whether they occur in all these groups.

The potential within-group heterogeneity complicates the interpretation of the findings for Hispanics. One must remember that Hispanics are a socio-demographically diverse group. While I strived for better precision by distinguishing Hispanics interviewed in Spanish from Hispanics interviewed in English, and by controlling for a number of factors that may contribute to the within-group sociodemographic heterogeneity, including socioeconomic status and geographical region, it is still possible that there is residual variation within each of these two Hispanic groups that affects the results. One potential reason why the statistical testing did not reveal significant interaction effects for Hispanics interviewed in Spanish is that the variation in the magnitudes of disparities in the perceived quality of care according to insurance plans may be limited to particular subsets of Spanish-speaking Hispanics, possibly distinguished by characteristics such as the degree of acculturation, ethnic and cultural backgrounds, national origin, etc. Further research with data containing more precise sociodemographic information is needed to examine whether partitioning Hispanics into more socio-demographically homogeneous groups would advance our understanding of their experiences in different types of healthcare plans.

Finally, it is important to reiterate that this study focuses on the quality of care *through the lenses of the patients*. Patients' evaluations of the quality of care, as reflected in the survey measures used in this study, may only partially reflect the actual physicians' behavior and other objective aspects of the physician-patient encounter. Previous research suggests that patients' reports of the quality of care tend to correspond to other types of measures of the quality of care, including measures derived from patients' records or from observations of physician-patient encounters. Therefore, we may expect that patients' reports are strongly influenced by what objectively happens in the physician-patient encounter. Yet, we must assume that other factors, especially those peculiar to the patient, also influence the patient's evaluations of the quality of care. More research is needed to disentangle the contributions of

individual factors to patients' evaluations of the quality of care. It seems especially important to evaluate whether the contribution of individual factors varies by race, ethnicity, and language abilities of the patient. If such variation exists, then patients' reports may reflect the objective quality of care less well for some racial/ethnic groups than for others.

Judging the accuracy of patients' evaluations of quality of care against the yardstick of other, more objective, measures of quality of care may be more meaningful for some aspects of care than for others. Arguably, physicians' thoroughness is one aspect of care that could successfully be measured both by patients' reports and by other methods. Yet, for other aspects of care, such as patient-physician communication, patients' evaluations may provide more meaningful information about the quality of care. The objective of physician-patient communication is the two-way transfer of information. Physicians are primarily responsible for the successful transfer of the information that flows from the physician to the patient. The patient, not the physician or another observer, is the best judge of whether a successful transfer of information took place. One measure of the quality of health care used in this study, namely the evaluations of how well physicians explained things, is illustrative. Patients are the best judges of whether physicians explained things to them in a way they could understand. Therefore, the patients' evaluations of the physicians' explaining skills may constitute a more meaningful measure of this particular aspect of the quality of care than other measures.

To ensure that information is communicated successfully, physicians must sometimes overcome linguistic or cultural barriers. Such obstacles to communication are especially common in interracial or interethnic physician-patient dyads. Recently, researchers and policy makers have been paying attention to cross-cultural competency strategies aiming to promote care that overcomes these barriers and better meets the needs of racial/ethnic minority patients. Such strategies include interpreter services, recruitment and retention of minority healthcare providers, and cultural immersion. Other strategies include training in determining patients'

social context, negotiation across cultures, and understanding the meaning of illness in different cultures (Brach and Fraser 2000, Carrillo, Green, and Betancourt 1999). Since the study presented in this chapter suggests that Hispanics may be at particularly high risk for low satisfaction in plans using capitation or a referral requirement, cross-cultural competency training for healthcare professionals may be especially important in managed care settings that use such policies and serve Hispanic populations.

This study evaluated the "real world" implications of the model proposed in Chapter 4, using national survey data on patients' experiences with their primary care. It did not, however, evaluate the core mechanisms proposed in the model. Specifically, it did not investigate whether provider-level factors contribute to racial and ethnic disparities in the quality of care, and whether the influence of these provider-level factors on the quality of care is stronger in some contexts than in others. To evaluate these core mechanisms, it is necessary to turn to a methodology better suited for causal analysis. Such causal analysis is the goal of the experimental study, which I describe in the following chapter.

CHAPTER 6

DO RACIAL/ETHNIC COGNITIONS AFFECT MEDICAL DECISIONS?
EXPLORATORY EXPERIMENTAL STUDY

This chapter reports an exploratory experimental study, the goal of which is to collect preliminary evidence on the causal mechanisms proposed in my conceptual model of racial/ethnic interaction in health care. This model specified that among factors contributing to racial/ethnic disparities in the quality of health care are provider-level factors, namely, providers' racial/ethnic cognitions that correspond to widely held negative beliefs about the members of minority racial/ethnic groups. Another goal of this study is to evaluate the feasibility of the experiment, since the experiment posed some technical challenges, which are explained later in this chapter.

The experiment described here examines how racial/ethnic cognitions affect physicians' decisions about diagnosis and treatment for a hypothetical patient with chest pain. General hypotheses H1 and H2 specified in Chapter 4 can be re-written so that they reflect more precisely the focus of this experimental study on racial/ethnic cognitions:

H1.2. *Ceteris paribus, when their cognitions regarding Blacks are activated, primary care physicians diagnose the condition of a hypothetical patient with chronic unstable angina[13] as less serious compared to the reference group.[14]*

H2.2. *Ceteris paribus, when their cognitions regarding Hispanics are activated, primary care physicians diagnose the condition of a hypothetical patient with chronic unstable angina as less serious compared to the reference group.*

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[13] Angina pectoris is characterized by chest pain resulting from oxygen deficiency in the heart, most commonly caused by the inability of coronary arteries to deliver enough blood to the heart.
[14] The reference group is described in more detail in the section titled Experimental Design.

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The general hypothesis H3, formulated in Chapter 4, proposed a similar effect for members of non-Black, non-Hispanic minority groups (i.e., Native Americans, Asians, Pacific Islanders, and Alaska Natives), whose health care should also be negatively affected by physicians' racial cognitions. However, because of the need to keep the number of experimental conditions in this exploratory study as small as possible to decrease the needed sample size, the present study does not examine the effects of the cognitions about Native Americans, Asians, and Pacific Islanders, and Alaska Natives. The examination of these effects on medical decisions is the subject of future research.

In Chapters 3 and 4, I argued that racial/ethnic cognitions, much like heuristic devices, are especially likely to be used when decision makers are under stress. Consistent with this argument, general hypotheses H4a and H5a posit that the sizes of the effects of the patient's minority status on the quality of care positively vary with physicians' stress. These general hypotheses can be specified for the purposes of this experiment as follows:

H4.2.a *Ceteris paribus, physicians' cognitions regarding Blacks have larger negative effects on diagnostic decisions about a hypothetical patient with chronic unstable angina when the physician is under high stress than when the physician is under low stress.*

H5.2.a *Ceteris paribus, physicians' cognitions regarding Hispanics have larger negative effects on diagnostic decisions about a hypothetical patient with chronic unstable angina when the physician is under high stress than when the physician is under low stress.*

*H*ypotheses H4a and H5b argue that race/ethnicity affects the quality of care only in high stress healthcare environments. Specific formulations of these hypotheses for the purposes of this experimental study are as follows:

H4.2.b *Ceteris paribus, physicians' cognitions regarding Blacks negatively affect diagnostic decisions about a hypothetical patient with chronic unstable angina only when physicians are under high stress but not when they are under low stress.*

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H5.2.b *Ceteris paribus, physicians' cognitions regarding Hispanics negatively affect diagnostic decisions about a hypothetical patient with chronic unstable angina only when physicians are under high stress but not when they are under low stress.*

Experimental Design

I use a 4 x 2 x 2 between-subjects experimental design. The manipulated factors include (1) racial/ethnic category to which racial/ethnic cognitions pertain (Black, Hispanic, White, and neutral as a control group), (2) types of racial/ethnic cognitions (i.e., implicit or explicit) and (3) the level of stress (i.e., low or high).

Racial/Ethnic Category. Participants in the experimental groups received treatment activating cognitions pertaining to one of the following three racial/ethnic categories: Black, Hispanic, and White. Participants in the control group did not receive any treatment activating racial/ethnic cognitions.

Reference Groups for Comparisons by Racial/Ethnic Conditions. The general hypotheses proposed in previous chapters concern the differences between the quality of health care for White patients vs. minority patients. Therefore, the intuitive choice for reference group appears to be the group of participants exposed to White stimuli. It can also be argued, however, that the reference group should be the neutral condition, in which participants were not exposed to any racial/ethnic stimuli. This is because cognitions about majority groups, such as Whites, may not be particularly meaningful in and of themselves, but only in contrast with cognitions about non-White racial/ethnic groups. Such reasoning suggests that activating White cognitions may be of poor utility unless it is done side by side with activating cognitions about a minority group (as it is done in the Implicit Association Test). In addition, exposure to White stimuli may inadvertently activate some aspects of cognitions about non-Whites, since the cognitions about Whites and about minority groups may be a part of a single "cluster" of cognitive processes. If such a linking process takes

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place, it would be reasonable to expect it especially in the implicit conditions, in which the conscious processing of the stereotypes was not possible and participants cannot consciously prevent the simultaneous activation of stereotypes about Whites and non-Whites. From this point of view, it seems methodologically cleaner to use the neutral condition as a reference group, even though comparisons to the neutral condition have lower ecological validity than comparisons to the White condition.[15] Since it is difficult to determine whether one of these two potential reference groups is clearly superior to the other, both are used as a reference in this study and the results are compared.

Type of Racial/Ethnic Cognitions. One advantage of the experimental design used in this study is that it makes it possible to separate implicit cognitive processes from explicit cognitive processes, and compare the effects of each of these two types of processes on medical decisions. This is accomplished by using two separate methods to activate implicit or explicit racial/ethnic cognitions.

To activate *implicit* racial/ethnic cognitions, sequential subliminal priming by racial/ethnic category labels was used. Sequential subliminal priming method has been widely used by cognitive social psychologists (Devine 1989, Lepore and Brown 1997, Wittenbrink, Judd and Park 1997, Abreu 1999, Rudman et al. 2001, Graham and Lowery 2004). It is uniquely suited for activating implicit racial/ethnic cognitions. It is unobtrusive, which means that the participants are not aware that the task in which they are participating pertains to race/ethnicity. This is because racial/ethnic stimuli are presented too briefly for the perceiver to process them consciously. Since the participants are unaware of the racial/ethnic focus of the

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[15] I could also be argued that neutral condition represents a general referent, which defaults to the dominant social category. Such an effect was demonstrated for gender in studies that revealed that men are often used as a standard category and a referent for gender comparisons (e.g., Eagly and Kite 1987, Eagly 1995). Interestingly, this effect was obtained for both genders. If a similar effect exists for racial/ethnic categories, we could expect that Whites represent a general referent, or a neutral person, not only for Whites but also for members of minority groups.

study, we may expect the elimination of social desirability bias toward "appropriate" responses that would be likely if racial/ethnic information was processed consciously. The method relies on displaying words representing racial/ethnic categories in very brief flashes, making it impossible for most people to process the words consciously. Detailed description of the subliminal priming method used in the study is included in the "Procedural Overview" and "Materials" sections.

Explicit racial/ethnic cognitions were activated by supraliminal presentation of racial/ethnic category labels, including "Black", "Hispanic" and "White". These stimuli were embedded in the hypothetical patient's medical chart. In the neutral explicit condition, physicians received no explicit (or implicit) racial/ethnic stimuli.

Physician Stress. Stress was manipulated by inducing time pressure. Physicians assigned to the low-stress experimental condition read and responded to a description of one patient in the 3-minute time limit. Physicians assigned to the high-stress experimental condition read and responded to a description of two patients in the 3-minute time limit.

The 4 x 2 x 2 experimental design yields the total of sixteen experimental conditions, as shown in Figure 6.1. Participants were assigned to experimental conditions randomly. The random assignment ensures that all factors that may influence the outcomes, except for the manipulated factors, are randomized and cannot confound results.

Figure 6.1. Experimental conditions.

| | Manipulated Factors | | | | |
Condition	Race, Ethnicity	Type of Cognition	Stress Level	Description	N
1	Black	Implicit	Low	Subliminal Black stimuli, 1 patient	6
2	Black	Implicit	High	Subliminal Black stimuli, 2 patients	3
3	Black	Explicit	Low	Supraliminal Black stimuli, 1 patient	14
4	Black	Explicit	High	Supraliminal Black stimuli, 2 patients	9
5	Hispanic	Implicit	Low	Subliminal Hispanic stimuli, 1 patient	6
6	Hispanic	Implicit	High	Subliminal Hispanic stimuli, 2 patients	7
7	Hispanic	Explicit	Low	Supraliminal Hispanic stimuli, 1 patient	8
8	Hispanic	Explicit	High	Supraliminal Hispanic stimuli, 2 patients	4
9	White	Implicit	Low	Subliminal White stimuli, 1 patient	3
10	White	Implicit	High	Subliminal White stimuli, 2 patients	5
11	While	Explicit	Low	Supraliminal White stimuli, 1 patient	6
12	White	Explicit	High	Supraliminal White stimuli, 2 patients	7
13	None	Implicit	Low	Subliminal White stimuli, 1 patient	6
14	None	Implicit	High	Subliminal neutral stimuli, 2 patients	8
15	None	Explicit	Low	Supraliminal neutral stimuli, 1 patient	5
16	None	Explicit	High	Supraliminal neutral stimuli, 2 patients	11

Programming and Pre-Tests

The Internet-based administration was a logical choice for a study with a geographically diverse physician sample. It enabled physicians to participate in the study at their convenience from any Internet-enabled location, instead of requiring that the physicians come to a laboratory or that a researcher bring the study to the participants on a laptop computer. Yet, the Internet as a medium for this experiment poses serious technical challenges, primarily associated with the diversity of software, hardware and types of Internet connections that the participating physician can be expected to use.

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One of the largest challenges proved to be the programming of the implicit experimental conditions. The method for activating implicit cognitions, sequential subliminal priming, relies on an extremely brief (i.e., about 80 milliseconds long) presentation of stimuli on the computer screen. In prior research, this method has been used mainly in laboratory-based experiments. The challenge was to develop the program that would reliably deliver such very brief stimuli over the Internet to all participants, regardless of the type of Internet connection and the type of computer equipment they used during the experiment. [16]

Programming was done by a professional programmer conversant in languages for Internet applications. It took over a year to complete. Several tests were conducted during the website development phase to evaluate the performance of the program in various computing environments, to determine the most appropriate lengths of the presentation of the subliminal racial/ethnic stimuli, and to improve the layout and flow of the study website. Initial pre-testers were friends and colleagues. Later pre-tests were conducted with a snowball sample of healthcare professionals, including physicians of various specialties (not limited to primary care practitioners), medical students, and nurse practitioners. Pre-testers provided helpful suggestions for improvement, which were used in several rounds of website revisions.

Sample

The physicians were sampled from the American Medical Association's (AMA) master file of all physician members and non-members in the United States and its possessions. Over 860,800 physicians are included in the AMA file. The AMA maintains the list of physicians

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[16] Other methods of the study of implicit cognitions, which may be less technically demanding, exist but they are not appropriate for this study. The Implicit Association Test (IAT), for instance, presents racial/ethnic stimuli for longer intervals. The problem with this test is that while measuring implicit bias, it also effectively activates explicit cognitions about race. If this test was administered before the physicians make decisions about a hypothetical patient, it could no longer be determined whether any potential differences in medical decisions were a result of implicit or explicit racial/ethnic cognitions.

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through surveys, publication mailings and contracts with medical schools, hospitals, specialty boards, state licensing agencies and medical societies. The list is updated weekly.

For the purposes of this exploratory project, the sample was limited to those physicians for whom an email address was available. Email addresses were obtained from Direct Medical Data (DMD), a data management company that offers lists of healthcare professionals to marketing companies and other customers.[17] This company builds the physician email list from several sources, and matches the email addresses to the current AMA records via unique physician license numbers to eliminate non-physicians and duplicates. According to DMD, email addresses are available for 33-37 percent of physicians in the AMA list, depending upon specialty. The owners of all email addresses in the DMD database must have opted in to receive messages from DMD and partner companies (mostly marketers). The email list is updated and re-matched to current AMA files monthly.

The DMD email list is proprietary. DMD does not provide an access to this list, but instead carries out the sample selection and the fielding for their customers. Since I could not assume that DMD is familiar with scientific methods of sampling, I provided detailed instructions for the sampling procedures. I instructed DMD to sample from the AMA list of physician *physical addresses,* not from the list of email addresses, so that in future studies, the sampled physicians for whom no email address was available could be invited to participate. Supplementing the sample in this way by physician addresses, instead of using solely emails, would improve the chances of obtaining a representative sample of physicians.

I requested that the sampling proceed in three stages. First, DMD was asked to select only family physicians and general internists. This limits the focus of the study to physicians who typically provide primary care in the US healthcare system. There are two reasons why I

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[17] I attempted to secure an email or address list directly from the AMA, but the AMA informed me that requests such as mine are to be handled by DMD. DMD is the only organization that, to my knowledge, owns a list of email addresses for physicians practicing in the U.S. and enables interested parties to use it.

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focus on primary care providers. First, primary care physicians often serve as gatekeepers to other, more specialized services. Second, unlike specialists, who tend to see patients with a limited symptom set, primary care physicians often see patients with ambiguous symptoms that could point to a variety of medical conditions. It is the job of the primary care physician to use their discretion in determining which medical specialty should deal more thoroughly with the type of symptoms the patient displays and to provide a referral to an appropriate specialist. Discretionary medical decisions, i.e., medical decisions that do not have a single correct response, often reveal the influence of non-medical factors in clinical decision-making (Mort et al. 1996), and may therefore be especially useful for my purposes.

Second, I asked DMD to select only physicians who practiced in 60 geographical sites selected for the Community Tracking Study (CTS) Surveys. The focus on these communities will enable me to conduct future studies that use characteristics of local healthcare markets available in CTS data. Third, I instructed DMD to use simple random sampling without replacement in batches of 1,000 physical addresses, and continue the sampling till a sample of 12,000 emails was reached. Data collection was conducted in four waves between November 2005 and February 2006 (November 8, 2005; November 16, 2005; December 14, 2005; February 21, 2006).[18]

Based on the DMD tracking system, 12,104 emails, in total, were attempted to be sent, out of which 11,619 were posted, while the rest was cancelled or returned an error message. Out of the posted emails, 6,550 (56%) received a response "ping", i.e., an acknowledgement that a host computer one is trying to reach is actually operating. If a response "ping" is

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[18] After the first two waves, in which it became apparent that some email addresses in the DMD database are not functional because they have either been cancelled or return an error message, I negotiated a slight increase in the number of sent-out emails for the following two waves to partially make up for these non-operational addresses. The cost of data collection was $1,400 for each wave, adding up to the total of $5,600. In addition, there was an attempt for a fielding on February 15, 2006. This attempt failed because of an error in the DMD production system. However, DMD informed me that some unknown number of emails was posted. According to the DMD email tracking system, 6 of these emails were opened.

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received, we can be confident that the message was delivered to the physicians' mailboxes. However, many institutions use software that eliminates the response "ping", so that spammers cannot learn whether or not the email addresses they are trying to reach are operational. As a result, tracking email delivery in the institutions that use such software is impossible.

Even though DMD selected only email addresses of physicians who were identified in the DMD records as family physicians or general internists, 17 respondents to my study self-identified as having another specialty. Among these physicians, 5 identified their specialty as internal medicine in combination with another specialty, including geriatrics (N=2), hospitalist (N=1), endocrinology (N=1), and urgent care (N=1). Three physicians identified their specialty as emergency medicine. Other specialties, each identified by one respondent, included cardiology, clinical toxicology, dermatology, endocrinology, hospitalist, interventional radiology, medical hematology, pain management, and psychiatry/neurology. Finally, one respondent self-identified as a clinical pharmacist. Respondents who self-identified as having other specialties besides family medicine or general internal medicine were excluded from the analyses.

I also excluded the respondents who participated in a portion of the study more than once (N=9). These respondents typically participated in some portion of the concentration exercise but did not fill in the survey. All of them were assigned a different condition on their first and their second trial. Since it is possible that some effects of the racial/ethnic stimuli delivered during the first trial persisted during the second trial, the data from these respondents could not be used, limiting the final sample to N=108.

Procedural Overview

Physicians were first contacted by email and asked to participate in an Internet-based study of medical decision-making. After accessing the study website, physicians received a brief introduction to the study and read and signed a consent form. Subsequently, physicians

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assigned to the implicit condition were told that they would participate in a "concentration exercise" and that their task would be to indicate, by pressing a designated key, whether each image appearing on their screens was a word or a random letter string. The true purpose of the "concentration exercise" was to deliver the subliminal stimuli activating participants' automatic racial/ethnic cognitions.

Second, the participants saw a short description of a patient with chest pain, presented in the form of a medical chart. In the implicit conditions, the patient description included no racial/ethnic identifiers. In the explicit conditions (except for the explicit neutral condition), the race/ethnicity of the patient was stated as "Black", "Hispanic" or "White".

Third, the physicians completed a survey asking how they would diagnose the hypothetical patient's condition. To induce time pressure, a time limit was imposed on answering the survey. Participants assigned to the low stress condition were informed that they would have 3 minutes to read the description of the patient and answer questions about the patient. Participants assigned to the high stress condition were informed that they would read descriptions and answer questions about *two* patients, one with chest pain and one with back pain, in the 3-minute limit. They were also informed how long (in pages) the survey about each patient would be. A time counter displaying the time remaining appeared at the top right-hand corner of the survey screens. After completing the survey about the hypothetical patient(s), participants reported their professional and socio-demographic characteristics. Finally, a debriefing and awareness check were presented.

Materials

Materials are listed in the same order as they were presented to the participants.

Contact Letter

The purpose of the contact letter, displayed in Appendix A, was to briefly explain the study and to direct the physicians to the study website. Physicians are among professionals

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who get approached frequently by pharmaceutical and other commercial companies with various requests, often by email. To minimize the non-response that the inundation by such requests might generate, extra care was taken in preparing the contents of the contact letter. Drawing on literature on survey research (in particular Krosnick and Alwin 1987, Krosnick 1991, 1999, McKee 1992), I incorporated several techniques recommended for increasing response rates and data quality in surveys, including the following: (1) The message was personalized, i.e., it addressed the physicians by their last names; (2) The message stated the approximate time commitment (about 10 minutes); (3) The message explained that as an incentive for participation, participants would have an opportunity to enter a lottery for a $500 prize; (4) The message stated that the recipient was a part of a carefully selected sample that represents family physicians and general practitioners across the US and that his or her response was needed if this study was to be successful; (5) The message contained information about the legitimacy of the study, including a reference to Stanford University Medical Center and full contact information for myself or for my dissertation advisor. The contents were revised several times, with the help of peers and colleagues, to keep the message as brief and clear as possible.

Implicit Priming Task ("Concentration Exercise")

Since it was imperative that the physicians remain unaware of the true purpose of the task, a cover-up task had to be used. Similar to previous studies, participants in this experiment were told that they would participate in a "concentration exercise". The instructions specified that a sequence of images would appear on their screens, and that their task was to indicate, by pressing a designated key, whether each image was a word (e.g., WINDOW) or a random letter sequence (e.g., DCYXPU). The participants were also instructed to work quickly. They were told that they would be scored on the speed and accuracy of their responses and that it was OK to make a few mistakes.

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According to Bargh and Chartrand (2000), subliminal priming hinges on three principles: (a) very brief parafoveal presentation of the prime stimulus (b) immediate masking by another stimulus and (c) an awareness check. In the following section, I describe in detail the material used for prime stimuli, masking, and the awareness check.

Racial/ethnic stimuli. For activation of the category Black, I used racial labels (BLACK, AFRO, and AFRICAN), and one Black stereotype-related word used by Devine (1989) for priming of the Black stereotype (RAP). For other racial/ethnic categories, I used solely category labels. For the category Hispanic, they included the following: HISPANIC, LATINA, SPANISH, CHICANA, and MEXICAN. For the category White, the following words were used: WHITE, EUROPEAN, ANGLO, and CAUCASIAN. The control group received priming by racially/ethnically neutral words, including the following: BLOCK, TEXT, MAP, and PERCENT.[19]

Following Patricia Devine's (1989) method, each priming sequence included racial/ethnic words along with neutral words unrelated to the racial/ethnic categories. The purpose of the inclusion of neutral words is to decrease the likelihood that the perceiver will see the racial/ethnic primes. Devine (1989) used 80 stereotype-related and 20 stereotype unrelated words in one condition and 80 stereotype-unrelated and 20 stereotype related words in another condition. She found that the effects of racial/ethnic priming on hostility were stronger in the condition that used more stereotype-related words, suggesting that as the percentage of neutral words in the priming sequence decreases, the strength and/or reliability of the priming of racial/ethnic cognitions increases.

To ensure that the racial/ethnic stimuli reliably activate implicit racial/ethnic cognitions, I used a priming sequence relatively high in the race/ethnicity related words. The sequence consisted of 8 neutral words and 57 race/ethnicity-related words. The decision to increase the

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[19] All words appeared on a white background in black block letters in Tahoma font (size=85).

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percentage of race/ethnicity related words compared to Devine was also guided by the need to keep the priming sequence as short as possible to decrease respondent burden. Higher percentage of racial/ethnic words enabled me to maximize the number of racial/ethnic primes in a relatively short sequence while at the same time following the general principle used by Devine of interspersing neutral and race/ethnicity-related words. The neutral words in my sequence included the following: SHOULD, PAPER, FORMAT, LOOK, TEACHER, HIGHWAY, DIFFERENCE, and LOOK. Words related to race/ethnicity and neutral words were ordered randomly.

Masking. Masking is needed to overwrite the respondents' visual buffer containing the previous image. Bargh and Chartrand (2000) explain that the effective duration of the stimulus is longer than the duration of its display for two reasons. First, the decay rate of electronically presented images is greater than zero, even though newer computer monitors tend to have faster decay rates than older ones. Second, people retain images in their iconic memory even after the image has disappeared from the display.

In this study, masks appeared for 600 milliseconds, which, in previous studies, was shown to be a long enough interval to reliably mask a preceding subliminal stimulus. The masks were either words with race-neutral content or a jumbled series of letters. To increase the efficacy of masking, an effort was made to design the masks so that they cover the same area on the screen as the prime word preceding them. This was accomplished by selecting for masks words or random letter sequences that were approximately equal in their actual (not

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letter) length. Where the word length allowed it, the same masking words were used across conditions. [20]

A perfect prime-mask match was used after some race/ethnicity-unrelated priming words. This technique accomplished an additional goal. Priming words are presented too briefly for most people to see them. Instead, most people see a brief flash before the mask, which can raise suspicion. The perfect prime-mask match decreases this suspicion.

Parafoveal Presentation. According to Bargh and Chartrand (2000), one important condition for successful activation of implicit stereotypes by subliminal priming is parafoveal presentation. Processing information presented parafoveally, i.e., within 2-6 degrees of the visual angle, mainly happens outside of conscious awareness. Therefore, parafoveal presentation allows one to "get away" with a longer duration of a stimulus before the stimulus enters conscious awareness. To achieve parafoveal presentation, each word in my experiment appeared in one of the four corners of the computer screen.

In order to maximize the likelihood that the stimuli fall into the participant's parafoveal field, it was also important to ensure that the visual focus returns to the center of the screen

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[20] Masks after Black primes included: PLANE, SHOULD, CONNECT, SHOES, SENSE, MINUTE, SCREEN, PEOPLE, PILLOW, SEVEN, PLANTS, STAIRS, WIND, GRASSY, HOUSES, EVER, ELBOW, CHAIR, DECIDE, WOMAN, CHOICE, SALT, MOUTH, HEALTH, WINDOWS, ROOF, BOOKS, PLAY, WATCH, and THURSDAY.
    Masks after Hispanic primes included: SENTENCE, TRAINING, STRONGLY, LISTENERS, FLAVOR, CONTEXT, MELTING, NUMBER, PICTURE, GROWING, MOTHER, SILENCE, PREVIEW, EXISTING, ORANGE, HIGH, STATIONS, FEMALE, FEATURES, WALKING, COMPLETE, BANANA, ALREADY, STATION, ROOF, GARDEN, RIVERBED, and BALCONY.
    Masks after White primes included: SUNDAY, ENORMOUS, EVERYONE, HOUSE, MOUNTAINS, SONGS, SALTY, SOMETHING, YESTERDAY, MOTORBIKE, UNDERSTAND, POETRY, DANCE, CLOSENESS, HOUSES, TELEVISION, RELATE, INTERVIEW, WATER, FIFTEEN, STEAMBOAT, MARKET, HEALTH, ROOF, CONSISTENT, JOURNEY, ELBOW, and BLUEBERRY.
    Masks after race/ethnicity neutral primes included: FLIGHT, CONNECT, SHOES, RAIN, MINUTE, SCREEN, WANT, PILLOW, SEVEN, PLANTS, STAIRS, WING, GRASSY, HOUSES, EVER, ELBOW, HAIR, DECIDE, WOMAN, CHOICE, SALT, MOUTH, HEALTH, WINDOWS, ROOF, BOWL, PLAY, WATCH, and THURSDAY.

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after each stimulus. Immediately after participants indicated whether the image on their screen (in fact, the mask immediately supplanting the priming word) was a word or a letter string, they received a message informing them whether or not their response was correct. If the participants pressed the correct key, they saw a large green X in the center of the screen accompanied by a following message: CORRECT ANSWER. GET READY FOR THE NEXT WORD. If the participants pressed an incorrect key, or took longer than 550 milliseconds to answer, they saw a large red X in the center of their screens, together with the following message: INCORRECT OR LATE ANSWER. GET READY FOR THE NEXT WORD. The message appeared for 600 milliseconds. The large X in the center of the screen was in fact the device centering participants' visual field after each trial.

Awareness Check. It is possible that a participant by chance glances at a parafoveal region exactly at the time when the prime image is presented there. In such a case, the participant would in all likelihood process the image consciously. It is important to ascertain whether or not conscious processing took place. The awareness check was performed after debriefing, which included the following statement: "For some participants, we activated automatic cognitions about race and ethnicity by very briefly flashing words associated with different racial and ethnic categories during the concentration exercise." Subsequently, the participants were asked: "Did you notice any words related to race or ethnicity during the concentration exercise? The participants who answered "yes" were further asked to specify the words they saw and later excluded if they identified at least one word correctly.

Description of Hypothetical Patient 1: Chronic Unstable Angina

Descriptions of hypothetical patients, sometimes also referred to as medical vignettes or simulated patients, have been shown to be a valid, comprehensive, and cost-efficient method of studying the processes of care in clinical practice (Peabody et al. 2000). I use a description of a patient with chronic unstable angina, who comes to the physician's office complaining of chest

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pain. The description draws on Kevin Schulman et al.'s (1999) study of the effects of a hypothetical patient's race/ethnicity on medical decisions. I purposefully selected the characteristics of this patient in a way that increased the ambiguity of the patients' condition.[21] Where possible, I chose characteristics suggesting medium to slightly elevated risk for coronary heart disease (CHD). The patient's description, which appears in its entirety in Appendix B, contains the following elements:

Gender and Age. It is important to provide the information of gender and age, since both of these characteristics are related to the likelihood of CHD. In addition, stating explicitly gender and age of the patient helps isolate racial/ethnic bias from other forms of bias, namely sexism and ageism. Across conditions, the hypothetical patient is a 62-year-old female. The gender assignment is based on the findings that physicians are more likely to discriminate based on race when dealing with female compared to male patients with chest pain (Schulman et al.'s 1999). The age of the hypothetical patient was selected based on the consultation with a family physician who was asked at which age, according to his experience, females are at a medium risk for CHD.

Race/Ethnicity. Statement of the patient's race/ethnicity appears in Black explicit, Hispanic explicit, and White explicit conditions. Race/ethnicity is stated in the very beginning of the patient description, which is important for the salience of racial/ethnic information. Depending on the condition, the patient is described as a "62-year-old Black female", "62-year-old Hispanic female", or "62-year-old White female". In all other conditions, the patient is presented without any racial/ethnic identifiers as a "62-year-old female."

Insurance Status. The patient's insurance was stated primarily to rule out the potential effects of stereotypes of the uninsured. These stereotypes could be activated by racial/ethnic stimuli, since racial/ethnic minorities in the United States are disproportionately uninsured

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[21] Ambiguous symptoms require *discretionary* medical decisions, which tend to reveal non-medical factors in clinical decisions better than non-discretionary decisions (Mort et al. 1996).

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(Hargraves 2004, The Kaiser Commission of Medicaid and the Uninsured 2005). Blue Cross–Blue Shield PPO was selected because, unlike many other popular types of insurance, it was not limited to specific region, but it existed nation-wide at the time of the study.

Medical Information. Schulman et al.'s (1999) study used hypothetical patients with blood pressure and cholesterol levels corresponding to the 20th-30th or to the 70th-80th percentiles for the risk of coronary artery disease, according to an epidemiological study by Abbott and McGee (1987).[22] To portray a patient with medium risk for CHD, I calculated means of the values used by Schulman et al. (1999). This calculation yielded the following values: Blood pressure 141/84; Blood cholesterol: Low-density lipoprotein, 152 mg per deciliter; high-density lipoprotein, 52 mg per deciliter.

In addition, the sections titled "Chief Complaint" and "History of Present Illness" inform the participants that the hypothetical patient suffers from dull intermittent pain in the left chest and left anterior shoulder, which had gradual onset about a year ago, is present both at rest and exertion, is worsened by exertion and is not worsened by deep breath, change in position, or movement. The "Diagnostic Tests" section states that electrocardiography indicated nonspecific T-wave changes and exercise EKG stress test indicated possible mild ischemia. These symptoms and test results were determined as possibly, but not conclusively, pointing to CHD.

Hereditary and Lifestyle Factors. To portray a patient with the ambiguous risk of CHD, I combined high-risk lifestyle factors with some mitigating characteristics. According to National Institutes of Health (NIH), father's or brother's myocardial infarction before age 55 or mother's or sister's myocardial infarction before age 65 constitutes at increased risk for

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[22] Schulman et al. (1999) used the following characteristics: blood pressure: low risk, 133/81 mm Hg; high risk, 145/86 mm Hg: blood cholesterol concentrations: low risk, low-density lipoprotein [LDL], 146 mg per deciliter [3.8 mmol per liter] and high-density lipoprotein [HDL], 59 mg per deciliter [1.5 mmol per liter]; high risk, LDL, 158 mg per deciliter [4.1 mmol per liter] and HDL, 46 mg per deciliter [1.2 mmol per liter].

CHD. The hypothetical patients' father had his heart attack at the age 70, which does not indicate increased risk according to NIH but may still alert the physicians to consider carefully other symptoms potentially indicating CHD. In addition, the hypothetical patient has a long smoking history, which is a well-known factor in CHD, but she quit smoking a year ago, which may have lowered her risk.

Personal Information. The purpose of including some apparently medically irrelevant information was to give room for interpretations using racial/ethnic stereotypes. The patient was described as divorced, working full time, and helping to provide childcare for her grandson. These descriptors could be interpreted as stereotypical of some minority females, but are at the same time vague enough to be common in any racial/ethnic group. The information in the "Observations" section was crafted to give an impression of some discomfort on the part of the patient, onto which the participating physicians could project their own racial/ethnic stereotypes. The patient was described as having a history of a missed appointment, appearing anxious and impatient, finding it hard to understand the physician, yet seeming more reassured at the end of the consultation.

Questionnaire about Patient 1

After reading the vignette about the patient with chest pain, physicians answered questions about how they would diagnose the patient. Similar to Schulman et al.'s (1999) study, physicians were asked to characterize the type of chest pain described by the patient and to estimate the probability that the patient has clinically significant coronary disease: "In your opinion, how likely is the patient's chest pain to be angina?" and "How likely is it that this patient has clinically significant CHD (i.e., at least 70% narrowing of one or more coronary

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arteries)?" Physicians chose a response on 10-point scales with 1 representing "not at all likely" and 10 representing "extremely likely".[23]

Description of Hypothetical Patient 2: Back Pain

The description of the second patient, who suffers from chronic back pain, was presented only to participants in high-stress conditions. The patient was a "44-year-old female" in all conditions except for explicit Black, explicit Hispanic, and explicit White. In these explicit conditions, the patient was described as a "44-year-old Black female", "44-year-old Hispanic female," or "44-year-old White female." The remainder of the patient description was invariant across conditions, and appears in its entirety in Appendix C.

Questionnaire about Patient 2

Physicians were asked whether they would recommend CT testing, MRI testing, and physical therapy for the Hypothetical Patient 2. They were further asked whether they would prescribe hydrocodone with acetaminophen (generic Lortab). Because only half the sample read and responded to the description of Patient 2, the number of responses was too small for meaningful analysis. These questions are therefore not examined in this study.

Questionnaire about Socio-Demographic and Professional Characteristics

The survey asked the physicians to report their gender ("male" or "female"), ethnic group ("Do you consider yourself Hispanic or Latino/a?" with response categories "yes" and "no"), and race ("American Indian/Alaska Native", "Asian", "Black or African American", "Native Hawaiian/Pacific Islander", and "White/Caucasian"). In addition, the physicians reported several professional characteristics[24], including their specialty ("family medicine", "general internal medicine", and "other specialty"), type of practice ("solo office practice", "an

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[23] Several other questions about case management and personal impressions of the patient were asked, but because of low response rates, they are not reported here.

[24] These questions are based on national surveys of physicians' practice patterns (Center for Studying Health System Change 2001a, Gold et al. 1995) and on studies by Grumbach et al. (1998) and Dudley et al. (2000).

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office with 2 to 10 physicians", "an office with 11 or more physicians", "a group-model HMO", "a staff-model HMO", "government practice" or "other"), and the year of graduation from the medical school. The physicians were also asked, "In your clinical experience, how many patients with chest pain similar to the patient described in this study have you seen?" with response categories including "0", "1-5", "6-10", "11-20", "21-50" and "more than 50".

Analytic Strategy

The success of any experiment depends on the successful manipulation of experimental factors. To determine whether or not such successful manipulation actually occurred in my experiment, I first performed several manipulation checks. Next, I estimated univariate and bivariate statistics. Formal hypotheses testing was performed by estimating multivariate generalized linear regression models of two dependent variables: physicians' evaluations of the likelihood that the patient had CHD and the evaluations of the likelihood that the patient had angina. The experimental factors served as main independent variables and physicians' sociodemographic and professional characteristics served as control variables. Models were estimated by maximum likelihood estimators (using the Newton-Raphson method of optimizing the log-likelihood), using Stata software (StataCorp 2005). Because of substantial differences in the experimental design between the implicit and explicit conditions, the models were estimated separately for the implicit and explicit condition.[25]

The generalized form of regression was chosen since it has the ability to provide a solution for the equations when the independent variables X are not linearly independent and the inverse of $X'X$ does not exist. This is a common problem in sparsely populated datasets, such as the one used in this study. Such datasets commonly produce non-full rank matrices, in which some cells may have very few cases or lack cases altogether and some predictor

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[25] There is also a technical reason for estimating separate models for the implicit and the explicit condition. If a pooled sample of both conditions was used, six two-way and three three-way interaction terms would be required for hypothesis testing in a single equation. This would pose a severe problem of multicollinearity and lead to biased estimates.

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variables may happen to be perfectly correlated. In addition to the improved ability to provide a solution with non-full rank matrices, generalized linear model procedure in Stata enables the researchers to bootstrap standard errors. Bootstrapping is a re-sampling technique useful when deviations from normality are present, which is common in small samples such as mine. Bootstrapping improves the properties of estimates in samples as small as N=20, even though a minimum of 50 cases is sometimes recommended for it to work well (Yung and Chan 1999).

Model 1 is designed to test hypotheses H1.2 and H2.2. Main independent variables are represented by racial/ethnic stimuli (i.e., Black, Hispanic, White, and neutral). In Model 1a, White is treated as a reference category. In Model 1b, neutral is treated as a reference category. The testing of hypothesis H1.2 is performed by examining whether the coefficients for the indicator of the Black condition in Models 1a and 1b are negative and significantly differ from zero. The testing of hypothesis H2.2 is accomplished by a similar examination of the coefficients for the indicator of the Hispanic condition. Models 2a and 2b include interactions between racial/ethnic stimuli and stress levels, in addition to the variables included in Model 1a and 1b. The interactions make it possible to determine whether the effects of racial/ethnic stimuli on physicians' responses vary by the stress levels, without having to split the already small sample by the stress levels. In all models, one-tailed statistical tests were used where directional hypotheses were stated; two-tailed tests were used in all other instances.

Results

Manipulation Checks. The manipulation check for stress was performed at the end of the study by asking, "How stressful did you find it to work under the time limit when answering questions about the patient(s)?" The response categories on a seven-point scale ranged from "not at all stressful" to "extremely stressful". A two-tailed t-test revealed that the subjective perceptions of stress were significantly higher among physicians in the high stress condition, who read and responded to a description of two patients (mean=4.13) compared to

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physicians in the low stress condition, who read and responded to a description of one patient (mean=3.28, p<.01). This result indicates that the stress manipulation was successful.

Another manipulation check concerned the subliminal nature of the racial/ethnic stimuli presented in the implicit condition. Despite the short length of the presentation of racial/ethnic stimuli, there is always a small risk of conscious processing, either because of high perceptual speed or an accidental direct glance at the stimulus. The awareness check determined that this was the case only for a single respondent, who indicated having seen words related to race/ethnicity and correctly identified some of these words. This result suggests that a vast majority of participants in the implicit condition was unaware of the racial/ethnic stimuli. We can assume that the racial/ethnic cognitions activated by these stimuli, if any, were mostly implicit. The respondent who correctly identified racial/ethnic stimuli was excluded.

Characteristics of the Sample. Table 6.1 shows the respondents' socio-demographic and professional characteristics. As expected, the majority of the respondents were males (66%) and Whites (71%). The percentages of Hispanics (11%) and Asians (18%) in the sample are larger than expected, given the under-representation of minorities among American physicians. About a half of the sample practiced family medicine, while the other half identified their specialty as general internal medicine. The respondents have, on average, practiced medicine since 1987, but some graduated as early as 1957, while others have spent as few as 5 years out of the medical school. Respondents were most commonly affiliated with practices staffed by 2 to 10 physicians (41%), followed by solo practices (27%), and academic practices (11%). Large practices with more than 11 physicians, HMOs, and government practices, are each represented by less than 10%. Most physicians reported having extensive experience with treating patients similar to the hypothetical patient with chest pain (Patient 1) described in this study – 76% of respondents said that in their clinical practice, they have seen more than 50 patients with similar symptoms to those described in the medical vignette.

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Table 6.1. Characteristics of the sample. Means and a standard deviation.

Sociodemographic Characteristics	
Male	.66
Hispanic ethnicity	.11
Race	
Black	.09
Asian	.18
American Indian/Alaska Native	.01
White	.71
Professional Characteristics	
General internal medicine	.53
Type of practice	
Solo office practice	.29
An office with 2-10 physicians	.41
An office with 11 or more physicians	.08
A group-model or staff-model HMO	.06
Government (VA, military)	.06
Faculty practice (academic or residence based)	.11
Number of patients similar to Patient 1 seen	
0	.01
1-5	.02
6-10	.05
11-20	.04
21-50	.13
More than 50	.76
Year of graduation from medical school	1986.91 (9.35)

Notes: N=108 for all variables except for the number of patients seen (N=107) and the type of practice (N=105).

The standard deviation for year of graduation appears in parentheses. The range for the year of graduation is 1958-2001.

Bivariate Analysis. Table 6.2 summarizes how participants diagnosed the hypothetical patient's chest pain by the experimental conditions. The top 4 rows display the means for the variable representing the evaluations of the likelihood that the patient has CHD for Black, Hispanic, White and neutral conditions. The lower half of the table shows similar figures for the variable representing the physicians' evaluations of the likelihood that the patient has angina. The means and mean differences are displayed separately for the implicit low stress condition, the implicit high stress condition, the explicit low stress condition, and the explicit high stress condition.

In general, most physicians evaluated the likelihood that the patient has angina as high. The overall mean, not shown in the table, was 7.33, with the standard deviation of 1.95. For the likelihood of CHD, the overall mean was also quite high (7.36), with a slightly smaller standard deviation (1.59). These results suggest that even though the description of the patient's symptoms was purposefully ambiguous and contained both risk factors and mitigating characteristics, the physicians readily picked up on the characteristics indicating the risk of heart disease, and placed more weight on them in their diagnostic decisions compared to the characteristics mitigating the risk. For both CHD and angina, the highest evaluations were given by participants in the neutral, explicit, high stress condition, while the lowest evaluations were given in Black, implicit, high stress condition.

The rows containing mean differences show 4 types of comparisons. First, they compare physicians exposed to Black stimuli to physicians exposed to White stimuli. Second, they compare physicians exposed to Black stimuli to physicians exposed to neutral stimuli. Third, they compare physicians exposed to Hispanic stimuli to physicians exposed to White stimuli. Finally, they compare physicians exposed to Hispanic stimuli to physicians exposed to neutral stimuli. The differences based on racial/ethnic stimuli are on average small, with most of them not exceeding an absolute value of one point on the 10-point measurement scale.

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Table 6.2. Diagnostic decisions about a hypothetical patient with chest pain by experimental conditions. Means and mean differences.

	Implicit Conditions		Explicit Conditions	
	Low Stress	High Stress	Low Stress	High Stress
How likely is this patient to have coronary heart disease? (1-10)				
Black	6.83	6.00	7.64	7.89
Hispanic	7.67	7.14	7.38	7.50
White	6.67	6.40	7.50	6.71
Neutral	7.33	7.88	7.00	7.91
Mean difference:				
Black-White	.17	-.40	.14	1.17
Black-Neutral	-.50	-1.88*	.64	-.02
Hispanic-White	1.00	.74	-.13	.79
Hispanic-Neutral	.33	-.73	.38	-.41
How likely is this patient's chest pain to be angina? (1-10)				
Black	6.00	5.33	7.93	7.11
Hispanic	8.00	7.14	6.88	7.50
White	7.00	7.80	7.33	7.29
Neutral	6.00	7.75	7.00	8.55
Mean difference:				
Black-White	-1.00	-2.47*	.60	-.17
Black-Neutral	.00	-2.42*	.93	-1.43
Hispanic-White	1.00	-.66	-.46	.21
Hispanic-Neutral	2.00	-.61	-.13	-1.05

Notes: N=108.

* p<.05, one-tailed t-test

However, in some cases, larger mean differences appear. In the high stress condition, physicians subliminally exposed to words representing Blacks give 1.88-point lower evaluations of CHD when compared to physicians subliminally exposed to neutral words (p<.05, one-tailed t-test). Even larger mean differences are found for the evaluations of the likelihood that the patient has angina. In high stress conditions, physicians subliminally

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exposed to words representing Blacks evaluate the likelihood of angina significantly 2.42 to 2.47 points lower compared to physicians who were subliminally exposed to words representing Whites or to neutral words (p's<.05, one-tailed t-tests). These differences, which span approximately a quarter of the range of the scale measuring the likelihood of heart disease, seem non-negligible.

Multivariate Analysis.

Evaluations of CHD, implicit conditions. Table 6.3 shows the results of multivariate generalized linear model of physicians' evaluations of the likelihood that the hypothetical patient has CHD, for the implicit conditions. In Model 1a, the evaluations of CHD in Black or Hispanic implicit conditions do not differ from the evaluations of CHD in the White implicit condition. Another pattern emerges in models comparing the Black implicit condition to the neutral implicit condition (Models 1b and 2b). In both models, compared to neutral stimuli, Black stimuli are associated with significantly lower evaluations of CHD. These results support hypothesis H1.2.

No significant effects are obtained for the interactions of the high stress indicator with Black and Hispanic indicators in Models 2a. These results suggest that in the implicit conditions, the sizes of Black-White and Hispanic-White differences in the evaluations of CHD do not differ by the levels of stress, failing to support hypotheses H4.2a and H5.2a. In contrast, a significant effect is obtained for the interaction between the Hispanic indicator and the high stress indicator in Model 2b. Additional testing of linear contrasts revealed that under high stress, physicians subliminally exposed to Hispanic stimuli give significantly lower evaluations of CHD than physicians subliminally exposed to neutral stimuli but under low stress, physicians subliminally exposed to Hispanic stimuli do not differ from physicians subliminally exposed to neutral stimuli. This result is consistent with hypothesis H5.2b.

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Table 6.3. Generalized linear models of the evaluations of the likelihood of coronary heart disease, estimated by maximum likelihood. Implicit conditions.

	Model 1a	Model 2a	Model 1b	Model 2b
Experimental factors				
High stress	-.37	-.96	-.37	.50
Racial/ethnic stimuli				
Black	-.44	-.62	-1.84†††	-1.15†
Hispanic	.73	.62	-.67	.10
White			-1.40*	-.53
Neutral	1.40*	.53		
Interactions				
Black * High stress		.18		-1.28
Hispanic * High stress		-.07		-1.53†
White * High stress				-1.46
Neutral * High stress		1.46		
Sociodemographic Characteristics				
Male	.04	.20	.04	.20
Hispanic ethnicity	1.26	1.39	1.26	1.39
Race[a]				
Black	-.18	.01	-.18	.01
Asian	-1.05	-1.03*	-1.05*	-1.03
Professional Characteristics				
Year of graduation	.00	.00	.00	.00
General internal medicine	.49	.55	.49	.55
Type of practice[b]				
Solo practice	-.39	-.38	-.39	-.38
An office with 11 or more physicians	-1.43*	-1.34*	-1.43*	-1.34
A group-model or staff-model HMO	.70	.19	.70	.19
Government (VA, military)	-1.09	-1.34	-1.09	-1.34
Faculty practice	.18	-.02	.18	-.02
Intercept	10.91	.10	12.31	0.63
Model Fit Statistics				
Deviance	66.29	62.28	66.29	62.28
AIC	3.97	4.05	3.97	4.05
BIC	-39.66	-32.32	-39.66	-32.32

Notes: N=44. Bootstrapped standard errors (200 samples) are used.
[a] Reference category is White [b] Reference category is an office with 2-10 physicians
One-tailed tests: †p<.05 †††p<.001
Two-tailed tests: * p<.05

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The lower portion of Table 6.3 displays fit statistics for each model, including the AIC (Akaike Information Criterion), BIC (Schwarz-Bayesian Information Criterion) and deviance. These statistics are helpful for comparing alternative models. The model with the lowest absolute values of AIC and BIC is the best one, since it better explains the data with the least number of parameters. Jeff Gill (2001) explains, however, that AIC and BIC can indicate different models from a set of alternatives as optimal, because AIC favors more explanatory variables and a better fit and BIC favors fewer explanatory variables and a poorer fit. In Table 6.3, the absolute values for BIC in the full models are lower than the absolute values for BIC in the constrained models, suggesting that adding the interaction terms to the regression equation improves the models fit. The examination of AIC statistics, however, does not lead to the same conclusion, since the absolute values of AIC are not lower in the full models compared to the constrained models.

The deviance is another measure commonly used for evaluating the fit of generalized linear models. It is calculated as the error sum of squares divided by the population variance. It has an advantage of having a chi-square distribution as N approaches infinity, which makes it possible to use it for statistical testing. The difference between deviances for a constrained and a full model has a chi-square distribution with the degrees of freedom equal to the difference in the number of parameters in the two models (Dunteman and Ho 2006). The examination of the deviances for the constrained and full models indicated that the improvement in the goodness of fit was not significant. However, this result must be regarded with caution, since the deviance statistic is poorly behaved in samples smaller than 100 cases (Gill 2001).

Evaluations of CHD, explicit conditions. Table 6.4 shows the results of multivariate generalized linear models of physicians' evaluations of the likelihood that the hypothetical patient has CHD, estimated for the explicit conditions. Model 1a reveals that the evaluations of the likelihood that the patient has CHD are significantly higher in Black or Hispanic conditions

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compared to the White condition. Similarly, in Model 1b, the evaluations of the likelihood that the patient has CHD are significantly higher in the Black condition compared to the neutral condition. These results directly contradict hypotheses H1.1 and H1.2.

Black-high stress and Hispanic-high stress interactions in Model 2a are not statistically significant. However, the Black-high stress interaction in Model 2b is statistically significant and negative. At the same time, the coefficient for the main effect of the indicator of the Black condition is significant and positive. These results suggest that in the low stress explicit condition, physicians who were exposed to the information that the patient is Black give higher evaluations of CHD than physicians who were not exposed to any racial/ethnic information. Further testing of linear contrasts showed that the Black-neutral difference was not significant in explicit low stress condition. These results fail to support hypotheses H4.2 and H5.2. Absolute values for BIC in the full models are lower than absolute values for BIC in the constrained models. In contrast, AIC values are not lower in the full model. The chi-square test for the difference between deviances for two models is not significant.

Evaluations of angina, implicit conditions. The second aspect of diagnostic decision-making examined in multivariate analysis concerns physicians' evaluations of the likelihood that the hypothetical patient has angina. Table 6.5 shows the results of multivariate generalized linear models of the evaluations of angina for implicit conditions. In Model 1a, physicians' evaluations of angina in the implicit Black condition are significantly lower compared to the implicit White condition. This result supports hypothesis H1.2. However, in Model 1b, physicians' evaluations of angina in the implicit Black or Hispanic conditions do not differ from evaluations of angina in the implicit neutral condition. Hypothesis H2.2 fails to receive support.

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Table 6.4. Generalized linear models of the evaluations of the likelihood of coronary heart disease, estimated by maximum likelihood. Explicit conditions.

	Model 1a	Model 2a	Model 1b	Model 2b
Experimental factors				
High stress	.50	-.39	.50	1.67*
Racial/ethnic stimuli				
Black	1.61†††	1.29†	1.08†	2.09††
Hispanic	1.32†	1.00	.79	1.79†
White			-.52	.80
Neutral	.52	-.80		
Interactions				
Black * High stress		.75		-1.31†
Hispanic * High stress		.84		-1.22
White * High stress				-2.06*
Neutral * High stress		2.06*		
Sociodemographic Characteristics				
Male	-.43	-.45	-.43	-.45
Hispanic ethnicity	.62	.46	.62	.46
Race				
Black	1.89***	2.01**	1.89***	2.01***
Asian	.53	.49	.53	.49
American Indian/Alaska Native	-.12	-.07	-.12	-.07
Professional Characteristics				
Year of graduation	-.02	-.01	-.02	-.01
General internal medicine	-1.08**	-1.35**	-1.08**	-1.35**
Type of practice				
Solo practice	.22	.31	.22	.31
An office with 11 or more physicians	.56	.74	.56	.74
A group-model or staff-model HMO	1.11*	1.43	1.11	1.43*
Government (VA, military)	.35	1.26	.35	1.26
Faculty practice	-.19	-.16	-.19	-.16
Intercept	38.59	35.39	39.11	34.59
Model Fit Statistics				
Deviance	110.91	105.57	110.91	105.57
AIC	4.05	4.10	4.05	4.10
BIC	-60.34	-53.45	-60.34	-53.45

Notes: N=59. Bootstrapped standard errors (200 samples) are used.
[a] Reference category is White [b] Reference category is an office with 2-10 physicians
One-tailed tests: †p<.05 ††p<.01 †††p<.001
Two-tailed tests: * p<.05 ** p <.01 *** p<.001

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Table 6.5. Generalized linear models of the evaluations of the likelihood of angina, estimated by maximum likelihood. Implicit conditions.

	Model 1a	Model 2a	Model 1b	Model 2b
Experimental factors				
High stress	.48	.95	.48	1.95
Racial/ethnic stimuli				
Black	-1.70[†]	-.85	-1.21	.15
Hispanic	.09	1.04	.58	2.05[†]
White			.50	1.00
Neutral	-.50	-1.00		
Interactions				
Black * High stress		-1.74		-2.74
Hispanic * High stress		-1.75		-2.75[†]
White * High stress				-1.00
Neutral * High stress		1.00		
Sociodemographic Characteristics				
Male	-.30	-.31	-.30	-.31
Hispanic ethnicity	1.32	1.17	1.32	1.17
Race[a]				
Black	-.05	.33	-.05	.33
Asian	.07	-.08	.07	-.08
Professional Characteristics				
Year of graduation	-.01	.00	-.01	.00
General internal medicine	-.87	-.81	-.87	-.81
Type of practice[b]				
Solo practice	.00	.29	.00	.29
An office with 11 or more physicians	-1.33	-1.05	-1.33	-1.05
A group-model or staff-model HMO	.07	.62	.07	.62
Government (VA, military)	-.68	-.65	-.68	-.65
Faculty practice	-.29	-.51	-.29	-.51
Intercept	23.11	6.84	22.61	5.83
Model Fit Statistics				
Deviance	123.21	108.80	123.21	108.80
AIC	4.59	4.61	4.59	4.61
BIC	17.25	14.20	17.25	14.20

Notes: N=44. Bootstrapped standard errors (200 samples) are used.
[a] Reference category is White [b] Reference category is an office with 2-10 physicians
One-tailed tests: [†] $p < .05$

The significant, negative interaction between the Hispanic indicator and the high stress indicator in Model 2b reveals that the differences between Hispanic and neutral conditions vary by the stress level. The positive coefficient for Hispanic in the same model suggests that under low stress, physicians subliminally exposed to Hispanic stimuli give higher evaluations of angina compared to physicians subliminally exposed to White stimuli. In contrast, in the high stress Hispanic condition, the evaluations of angina are lower compared to high stress neutral condition. Further testing of linear combinations of coefficients, however, reveals that this difference is not statistically significant. Therefore, hypotheses H4.2 and H5.2 are not supported.

The BIC and deviance statistics in Table 6.5 suggest that the models that include the interaction terms fit the data better than the models without the interaction terms. The BIC values in the full models are lower than the BIC values statistics in the constrained models. However, the values of AIC are similar in the two models. The chi-square test for the difference between deviances for two models is significant ($p<.01$), indicating that adding interaction terms significantly improves the fit of the model.

Evaluations of angina, explicit conditions. The results of multivariate generalized linear models of physicians' evaluations of the likelihood of angina in the explicit conditions are displayed in Table 6.6. In Model 1a, physicians in the explicit Hispanic condition give significantly higher evaluations of the likelihood that the patient has angina compared to physicians in the explicit White condition. In Model 1b, physicians in explicit Black or Hispanic conditions do not differ from physicians in explicit neutral condition. Based on these results, Hypotheses H1.2 and H2.2 are not supported. In Model 2b, significant negative effects are found for the interaction between the Black indicator and the high stress indicator and for the interaction between the Hispanic indicator and the high stress indicator, suggesting that the effects of the explicit Hispanic and Black stimuli vary by stress levels. In the low stress

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condition, physicians who were told that the patient was Black or Hispanic evaluated the likelihood that the patient had angina significantly higher than physicians who were not told anything about the patient's race/ethnicity. Additional testing of linear contrasts revealed that under high stress, Hispanic and Black conditions did not significantly differ from the neutral condition.

The absolute values for AIC statistics in the full models are approximately equal to the absolute values for AIC statistics in the constrained model, while the absolute values of BIC in the full models are higher compared to the constrained models. A contrasting result was obtained based on the deviance measure, which is significantly higher in the constrained model compared to the full model ($p<.001$, chi-square test). According to this result, adding interaction terms improves the fit of the model.

Table 6.7 helps understand the magnitudes of racial/ethnic differences in evaluations of CHD and angina, based on the results of multivariate analyses. The predicted mean differences are calculated for each experimental condition. Tests of significance were performed by estimating series of linear contrasts in Stata. Several interesting patterns emerge. First, it is clear that predicted mean differences in the expected direction, i.e., negative differences, are limited to the implicit conditions. Five out of the 16 mean differences calculated for the implicit conditions are negative and significant. Three of these significant differences are between physicians who were subliminally exposed to Black stimuli and physicians who were subliminally exposed to neutral stimuli. Another significant negative difference is between the implicit Black condition and the implicit White condition. The final significant difference is between the implicit Hispanic condition and the implicit neutral condition. Five additional differences are in the expected direction, but fail to reach statistical significance. Almost all significant negative differences are found in the high stress conditions (4 cases), while only one significant negative difference is found in the low stress conditions.

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Table 6.6. Generalized linear models of the evaluations of the likelihood of angina, estimated by maximum likelihood. Explicit conditions.

	Model 1a	Model 2a	Model 1b	Model 2b
Experimental factors				
High stress	.51	.51	.51	2.71††
Racial/ethnic stimuli				
Black	.95	1.56	.16	2.27††
Hispanic	1.15††	1.52	.36	2.23†
White			-.79**	.71
Neutral	.79	-.71		
Interactions				
Black * High stress		-1.19		-3.40†
Hispanic * High stress		-.12		-2.32†
White * High stress				-2.21*
Neutral * High stress		2.21*		
Sociodemographic Characteristics				
Male	-.46	-.47	-.46	-.47
Hispanic ethnicity	-.48	-.60	-.48	-.60
Race [a]				
Black	1.43**	1.72**	1.43**	1.72**
Asian	.54	.72	.54	.72
American Indian/Alaska Native	1.37	1.24	1.37	1.24
Professional Characteristics				
Year of graduation	-.01	-.01	-.01	-.01
General internal medicine	-1.20**	-1.61**	-1.20**	-1.61**
Type of practice [b]				
Solo practice	-.06	.00	-.06	.00
An office with 11 or more physicians	.21	.90	.21	.90
A group-model or staff-model HMO	.92	1.27	.92	1.27
Government (VA, military)	-.32	.96	-.32	.96
Faculty practice	-.06	-.23	-.06	-.23
Intercept	23.96	20.13	24.75	19.41
Model Fit Statistics				
Deviance	162.02	143.38	162.02	143.38
AIC	4.42	4.40	4.42	4.40
BIC	-9.24	-15.65	-9.24	-15.65

Notes: N=59. Bootstrapped standard errors (200 samples) are used.
[a] Reference category is White [b] Reference category is an office with 2-10 physicians
One-tailed tests: †p<.05 ††p<.01
Two-tailed tests: *p<.05 **p<.01

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Table 6.7. Predicted mean differences in diagnostic decisions, adjusted for physicians' sociodemographic and professional characteristics.

Comparison	Implicit (N=44)		Explicit (N=59)	
	Low Stress	High Stress	Low Stress	High Stress
How likely is this patient to have coronary heart disease?				
Black-White	-.62	-.44	1.29*	2.04***
Black-Neutral	-1.15*	-2.43***	2.09***	.78
Hispanic-White	.62	.55	1.00	1.84***
Hispanic-Neutral	.10	-1.44*	1.79*	.58
How likely is this patient's chest pain to be angina?				
Black-White	-.85	-2.60*	1.56	.37
Black-Neutral	.15	-2.59*	2.27*	-1.12
Hispanic-White	1.04	-.71	1.52	1.40**
Hispanic-Neutral	2.05*	-.71	2.23*	-.09

One-tailed tests: * p<.05 ** p <.01 *** p<.001

A very different picture emerges from the portion of Table 6.7 that shows predicted mean differences for the explicit conditions. In this table portion, we find *no* significant mean differences in the expected direction. All significant differences are positive, suggesting that physicians reading a vignette in which the hypothetical patient was Hispanic or Black evaluated her condition as more serious compared to physicians who read that the patient was White or who did not read any racial/ethnic information. The significant differences in the explicit conditions are distributed equally between high and low stress situations.

Summary of Multivariate Results. Figure 6.2 summarizes the results of the multivariate analyses, vis-à-vis the research hypotheses. The fields with dark shading indicate that a hypothesis was supported. The figure shows that hypothesis H1.2 receives support for both dependent variables in the implicit conditions. Physicians in Black implicit condition are give lower evaluations of the likelihood of CHD compared to the neutral implicit condition and also evaluate the likelihood of angina lower compared to White implicit condition. This hypothesis is not supported for the explicit conditions. Hypotheses H2.2, H4.2a and H5.2a are not

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supported. Finally, hypotheses H4.2b and H5.2b receive limited support. They are supported for evaluations of angina in the implicit conditions, when White is used as a reference group. Hypothesis H5.2b is also supported for evaluations of CHD in the implicit conditions, when neutral condition is used as a reference group.

In addition to the results of statistical tests, Figure 6.2 indicates which results are consistent with the hypotheses in the direction of the effect but are not statistically significant. These instances are indicated by fields with light diagonal shading. Examination of these instances may be useful given the small sample size, which results in low statistical power. Effects consistent with the hypotheses in their directions provide some indication of the plausibility of my hypotheses, even though this indication is clearly weaker compared to statistical testing.

The most pronounced pattern is the clustering of the negative differences in the implicit conditions, a finding consistent with those revealed by statistical tests. In the implicit conditions, 16 significant or non-significant effects are in the expected direction. In contrast, only 2 effects in the explicit conditions are in the expected direction. These results strongly suggest that compared to the explicit cognitions, implicit cognitions are more important factors contributing to healthcare disparities for Blacks and Hispanics.

Figure 6.2. Summary of experimental results.

Hyp.	Reference Group	Brief statement of hypothesis	Model	CHD		Angina	
				Imp	Exp	Imp	Exp
H1.2.	White	Black mean lower vs. White mean	1a	▨		■	
	Neutral	Black mean lower vs. neutral mean	1b	■		▨	
H2.2	White	Hispanic mean lower vs. White mean	1a				
	Neutral	Hispanic mean lower vs. neutral mean	1b	▨			
H4.2.a	White	Negative Black-White mean diff. larger under high stress vs. low stress	2a			▨	
	Neutral	Negative Black-Neutral mean diff. larger under high stress vs. low stress	2b	▨		▨	
H5.2.a	White	Negative Hispanic-White mean diff. larger under high stress vs. low stress	2a			▨	
	Neutral	Negative Hispanic-Neutral mean diff. larger under high stress vs. low stress	2b	▨		▨	
H4.2.b	White	Negative Black-White mean diff. only under high stress	2a*			■	
	Neutral	Negative Black-neutral mean diff. only under high stress	2b*			▨	▨
H5.2.b	White	Negative Hispanic-White mean diff. only under high stress	2a*			■	
	Neutral	Negative Hispanic-neutral mean diff. only under high stress	2b*	■		▨	▨

Notes: CHD=coronary heart disease. Imp=implicit conditions. Exp=explicit conditions.

Dark shading indicates that the hypothesis was supported by statistical testing. Light shading indicates that the effect is in the expected direction, but it is not statistically significant.

* Linear combinations of coefficients were tested.

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Discussion

Feasibility. One of the goals of the exploratory study was to evaluate whether the Internet-based methodology developed was feasible, and could potentially be used in a larger-scale experiment. The greatest challenge was to develop a method that would reliably deliver subliminal stimuli across a range of computing environments and across various types of Internet connections. The results suggest that the subliminal priming method was developed successfully and a larger-scale study using the Internet-based method is feasible in principle. A very small percentage of physicians were aware of the subliminal racial/ethnic stimuli presented to them, which is a satisfactory result. In addition, despite the small size of the sample, I obtained *some* significant effects of the implicit racial/ethnic stimuli that were consistent with the existing theoretical and empirical scholarship. Even though these effects were not obtained consistently across all of the models I investigated, and were not particularly large, they do suggest that medical decisions respond to the activation of racial/ethnic cognitions by subliminal priming. The method used in this study might produce more consistent, significant results if a larger sample were obtained. However, the exploratory study revealed other challenges, especially those posed by low response rates among physicians. They constitute the limitations of the study, discussed in the following section.

Limitations. One notable limitation of this study is the low response rate. Depending on the method of calculation, the response rates range from 1 percent (if all posted messages are considered) to 2 percent (if only confirmed delivered messages are considered). The low response rate should not be surprising, since physicians are one of the hardest populations to reach in surveys. They get approached by companies able to offer much higher compensation for their participation than I could. Given these low response rates, the sample must be considered a convenience sample, which in all probability does not correctly represent the

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physician population in the United States. Since we do not know exactly what the biases in this sample are and what population the sample represents, caution must be also used in generalizing to theoretical situations insofar as the nature of the population is a factor in them.

Aside from the problems with generalization, the low response rate led to a small sample size (N=108), which posed additional concerns for statistical analysis. To help understand some of these problems, Sharon Kramer and Robert Rosenthal (1999) evoke the fundamental relationship between the sample size and the ability to detect relationships between variables by statistical testing. Detecting relationships statistically is easier as the sample sizes increase (except when the true relationship is zero, in which case even large samples will produce non-significant results). Consequently, small samples commonly yield results that do not reach the conventional levels of statistical significance, especially when the sizes of the effects are small to medium. Such results may lead the researchers to mistakenly conclude that no relationship between variables exists, even though the relationship may be important and would clearly be shown by statistical tests if a larger sample were available.

Statistical testing is generally not recommended for samples with fewer than 30 observations. Samples between 30 and 150 observations are considered small (Hoyle 1999). With N=108, the sample used in this study falls into the "small" category. In addition, the effective sample size used for some statistical tests in this exploratory study is much smaller, because the sample is split into groups based on experimental conditions. In some instances, the effective sample size does not exceed 44 cases. Therefore, results of the hypotheses tests presented in this study must be viewed as preliminary. Further research with a larger sample is needed to provide more conclusive evidence on the hypotheses proposed in this study.

It is important to note that the size of my sample is actually not unusually small in experimental research. Experiments differ from large survey studies in that they are not designed to provide information about the characteristics of a population, but focus on

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understanding causal relationships between variables. Since randomization effectively eliminates the effects of potential confounding factors, the researcher can use relatively small samples to show these relationships, provided the relationships are reasonably strong. More cases are needed to show weaker effects. Given that the effects found in this experiment are generally subtle, it is clear that the study would benefit from a larger sample.

In contrast to pure experimental designs, which rely exclusively on control by randomization, my study also uses statistical controls in multivariate models. For multivariate models such as mine, the sample size of a hundred or fewer cases is very small. As became apparent in my analyses, estimation of models with such small Ns is often problematic, and sometimes impossible. In addition to estimation problems, there are problems with evaluating the fit of the models that do estimate. Commonly used fit statistics, such as model chi-square, tend to be poorly behaved in small samples, making it difficult to evaluate whether a model fits the data well or whether an alternative, better fitting, model should be sought.

Another problem is related to the unequal distribution of responses by conditions. While some experimental conditions obtained as many as 14 responses, others obtained as few as 3. I explored whether there were systematic differences in response rates by conditions. Such differences would suggest that in some conditions, respondents were more likely to quit the study before finishing than in other conditions. Considerably more responses were obtained in the explicit conditions (N=64) compared to the implicit conditions (N=44). This difference can be explained by the fact that the implicit priming added time to the study. Interestingly, the response rates did not vary by stress levels. In both the high stress and the low stress conditions, I obtained the same number of responses (N=54). Similarly, the response rates did not show pronounced differences by racial/ethnic conditions. According to these results, it is not the stressfulness of the task or explicitly mentioning race, but simply the lack of time that discourages some physicians from completing the study as anticipated. The feasibility of the

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study in terms of obtaining higher response rates could possibly be improved if the study were shorter.

The smallest cells, which have only 3 or 4 observations, are of particular concern. The results based on the comparison of these cells to others must be interpreted with special caution. Among the cells with very low observation count is the implicit, high stress, Black condition. Because of the small cell counts, the results pertaining to this condition must be regarded as more tentative than others, and a study with a larger number of respondents is needed to see whether these results can be replicated.

Conclusions. One of the goals of this experiment was to provide preliminary tests of two sets of hypotheses derived from the conceptual model proposed in Chapter 4. The first set of hypotheses argued that when cognitions regarding Blacks or regarding Hispanics are activated, physicians diagnose the chest pain of a hypothetical patient as less serious compared to the reference group. Partial support for this hypothesis was obtained in the implicit conditions. Physicians subliminally exposed to Black and Hispanic stimuli rated the patient's health problem as less serious than physicians subliminally exposed to neutral stimuli. In contrast, physicians who were explicitly told that the patient was Hispanic or Black tended to rate the patient's condition as more serious compared to physicians who were told that the patient was White or who were given no racial/ethnic information.

The second set of hypotheses suggested that the effects of racial/ethnic cognitions on medical decisions were stronger, or more common, under high stress than under low stress. These hypotheses received some support in the implicit condition, but not in the explicit condition. Consistent with these hypotheses, significant differences between physicians subliminally exposed to Black or Hispanic stimuli and physicians subliminally exposed to White or neutral stimuli were only found in high stress situations.

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First, I must reiterate that due to the small N, these results must be seen as tentative. Caution is needed in generalizing the results to theoretical situations in which the population factors may play a role. (Since we do not know how the sample is biased, it is difficult to determine what such situations may be). In addition, caution is needed when interpreting the effects of the implicit Black cognitions, because of the particularly small number of observations in this experimental condition. This caution notwithstanding, several aspects of the experimental results are worth noting. First, the hypothesized effects are found exclusively in implicit conditions, not in explicit conditions, suggesting that racial/ethnic differences in the diagnostic decisions that potentially lead to a disadvantage in the quality of care for racial/ethnic minorities, *if* they exist, are mainly a result of implicit, not of explicit racial/ethnic biases.

In fact, in the explicit condition, the racial/ethnic effects were opposite to the expected direction. There are several potential explanations for the finding that physicians, when aware of patient's racial/ethnic status, tended to *advantage* minorities. One is a social desirability bias, which is the tendency to adjust one's behavior to fit social norms when being observed. Physicians who were told that the patient was Black or Hispanic may have been alerted to the fact that they were being observed as to whether or not this racial/ethnic information would affect their responses. Since racial bias is socially undesirable, physicians affected by social desirability bias may have adjusted their responses, recommending higher quality of care for Black and Hispanic patients than they would have if they were not being observed in a study.

Another potential explanation for the unexpected racial/ethnic effects in the explicit condition concerns a genuine effort not to be prejudiced, sometimes referred to as motivational "overwriting". This is a phenomenon in which motivated effort overwrites the effects of an experimental treatment. In this case, the physicians' motivation for unbiased responses may have overwritten the activation of racial/ethnic biases. Unlike the social desirability bias,

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which expresses the motivation not to *appear* prejudiced to the observers, motivational overwriting expresses motivation not to *be* prejudiced, whether or not observed. Such motivation seems consistent with the physicians' professional ethics and may reflect the increasing awareness of racial/ethnic disparities in the quality of care among American physicians. As racial/ethnic disparities in health care are receiving more public attention, more physicians may make conscious efforts not to contribute to these disparities and to keep their medical practices free of any racial/ethnic biases. This effort may actually lead to overcorrecting, i.e., recommending a higher quality of care for Black and Hispanic patients compared to White patients, as was evident in the explicit conditions of my experiment.

A related mechanism that may help explain the fact that physicians in the explicit conditions evaluated Blacks' and Hispanics' illness as more serious concerns statistical discrimination based on the poorer health of minority Americans. Statistical discrimination is making decisions based on the average characteristics of groups. Racial/ethnic minorities, especially Blacks and Hispanics, are known to suffer from poorer general health compared to Whites. During the recent decade or two, racial/ethnic disparities in health care have received considerable attention. In fact, the attention to racial/ethnic disparities in health *care* has been partially motivated by the profound racial/ethnic inequalities in health. Physicians are likely to be aware that Blacks and Hispanics are commonly affected by serious health conditions. They may also know that, on average, Blacks and Hispanics present to them with later stage illnesses, when their health problems are more serious and more difficult to treat. In this experimental study, racial/ethnic clues may have served to activate such knowledge, leading physicians to diagnose Blacks and Hispanics as more seriously ill compared to Whites or to racially/ethnically neutral patients.

Another noteworthy finding is that the expected racial/ethnic differences emerge almost exclusively in the high stress condition, but not in the low stress condition. This finding is

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consistent with the theoretical model of racial/ethnic cognitions in health care, specified in Chapter 4. This model argues that implicit racial/ethnic cognitions are more commonly used in situations in which cognitive resources needed for more deliberate processing of complex information are lacking, such as when a person experiences high levels of stress. Stress in this study was manipulated by varying the number of hypothetical patients the physicians had to "see" in a given time interval. It can be assumed that physicians in the high stress condition had to "ration" their cognitive resources between two patient cases, while the physicians in the low stress condition could devote all of their cognitive resources to a single case. The results suggest that having to ration cognitive resources in this way resulted in a greater reliance on resource-saving implicit racial/ethnic cognitions.

These experimental findings, though tentative because of the limitations of this study, are consistent with several strands of literature in cognitive psychology that show various forms of social cognitions, including stereotyping and bias, to be commonly activated and used when the availability of cognitive resources is low, possibly to save cognitive resources and increase cognitive efficiency (Allport 1954, Dijker and Koomen 1994, De Dreu 2003, Bodenhausen and Lichtenstein 1987, Bodenhausen et al. 1998, Brewer 1988, Fiske and Neuberg 1990, Gilbert and Hixon 1991, Macrae, Hewstone, and Griffiths 1993, Monteith and Voils 1998; see also Fiske and Taylor, 1991 on the "cognitive miser" model). It has been known for over a decade that stereotypes serve to economize cognitive resources among individuals who perform several cognitive tasks simultaneously (Macrae, Milne, and Bodenhausen 1994). Newer findings suggest that the relationship between low cognitive resources and the higher use of social biases is evident even among individuals who are highly motivated to suppress their biases. In a recent experimental study, for instance, alcohol, which can decrease the availability of cognitive resources, significantly impaired the ability to inhibit race-biased behavior (Bartholow et al. 2006). Some evidence suggests that conscious effort can

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in some cases help modify implicit biases, but such effort is unlikely to be successful under stress, such as in situations when physicians must hurry and multitask. I further discuss the problem of modifiability of racial/ethnic cognitions in the next chapter.

As mentioned before, the differences in the expected direction were mainly found in the implicit high stress conditions. Yet, even in these conditions, the differences in the expected direction did not emerge consistently across all models and for all comparisons. One potential explanation concerns the length of exposure to subliminal racial/ethnic stimuli. The 80-ms length of stimuli was determined based on previous research using sequential subliminal priming as well as extensive pre-testing. The goal was to present the stimuli for short enough time so that a large majority of respondents cannot register them consciously. Awareness checks confirmed that this goal was achieved, with only one respondent correctly identifying the subliminal racial stimuli that had been presented to her. This represents a smaller recognition rate than expected, which may mean that for some respondents, the stimuli were actually too short to activate the automatic racial/ethnic cognitions. In future runs of this experiment, a small increase in the exposure time, perhaps by 5 milliseconds, may more reliably prime automatic racial/ethnic cognitions, leading to stronger experimental effects (even though it would probably also result in higher recognition rate and more respondents who would need to be excluded because they noticed the racial/ethnic stimuli).

To conclude, the exploratory experimental study provided partial support for the conceptual model of racial/ethnic interaction in healthcare settings proposed in the previous chapters. However, due to the limitations of the study, this evidence must be considered preliminary. If future studies that overcome these limitations replicate the results of this study, it will be possible to refine the conceptual model of racial/ethnic interaction by specifying in more detail how the mechanisms in racial/ethnic interaction in health care work. Some of the implications of such evidence are foreshadowed in the following chapter.

CHAPTER 7

SUMMARY AND CONCLUSIONS

This dissertation was motivated by the effort to increase the understanding of factors that contribute to racial/ethnic disparities in the quality of health care. I approached this problem from a micro-level perspective. Using theoretical and empirical literature in cognitive social psychology, I developed a model of micro-level mechanisms in racial/ethnic interaction and explored its utility for explaining racial/ethnic inequalities in healthcare settings. I argued that one important, but little understood, factor contributing to these inequalities is represented by racial/ethnic cognitions, which correspond to widely held cultural beliefs about racial/ethnic groups. These cognitions are mostly automatic, but they nevertheless shape the medical decisions in ways that disadvantage minority patients. Since racial/ethnic cognitions serve as energy serving devices, their use is increased in concrete contexts characterized by high stress, such as in managed care settings.

To evaluate the proposed model, I adopted a dual-method approach, combining survey and experimental methods. Survey data from a large probability sample of Americans were used to examine how race/ethnicity and stress-inducing organizational characteristics influenced the quality of health care, as evaluated by patients. I found strong support for the hypotheses proposing that Blacks, Hispanics, and members of other minority groups (i.e., Asians, Native Americans, Alaska Natives, and Pacific Islanders) evaluated the quality of the care they received during their last visit to their primary care physicians less favorably than did White patients.

I also tested hypotheses arguing that the magnitudes of the relationships between patients' race/ethnicity and the quality of care varied by the cost-containment policies

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implemented by managed care plans. I obtained partial support for these hypotheses. The differences between Whites and Hispanics interviewed in English were significantly larger when managed care policies were used compared to when these policies were not used. In addition, the differences between Whites' and non-Black, non-Hispanics minorities' evaluations of the physician's explaining skills were larger under two out of the three examined managed care policies (i.e., the requirement to sign up with a PCP and the requirement to obtain a referral).

Stronger support was obtained for the alternative formulations of these hypotheses, which posited that racial/ethnic disparities in the patients' evaluations of the quality of care exist when managed care policies are used but not when these policies are not used. Consistent with these hypotheses, Hispanic-White disparities in the patients' evaluations of how well the physician explained were limited to managed care settings. Hispanics interviewed in Spanish evaluated the physicians' thoroughness as lower than Whites only in managed care settings, but not in other settings, and Hispanics interviewed in English evaluated their physicians' thoroughness as lower than Whites when capitation was used but not when capitation was not used. Non-Black, non-Hispanic minority patients evaluated the quality of their care as lower than Whites in insurance plans using gatekeeping but not in other plans. Finally, Blacks evaluated their physicians' thoroughness lower than Whites when a sign-up with a contracted physician was required, but not otherwise.

This pattern of results is strongly suggestive that racial/ethnic disparities in the quality of health care occur more commonly in healthcare environments that use managed care policies compared to healthcare environments that do not use managed care policies. Significant racial/ethnic/language-based disparities were found in nine out of the twelve managed care scenarios for patients' evaluations of how well the physician explained and in eight out of the twelve managed care scenarios for patients' evaluations of how thorough the

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physician was. In contrast, I found significant racial/ethnic/language-based disparities only in three out of the twelve non-managed care scenarios for patients' evaluations of how well the physician explained and in one out of the twelve non-managed care scenarios for patients' evaluations of how thorough the physician was.

Second, I conducted an experimental study to explore in greater depth the causal mechanisms potentially leading to racial/ethnic disparities such as those found in my survey study. The experiment focused on the role of physicians' racial/ethnic cognitions in medical decisions and on the stress-related variation in the effects of these cognitions. It was conducted over the Internet with a sample of primary care physicians nationwide. Consistent with the hypotheses, the results revealed that physicians whose implicit cognitions about Blacks were activated by subliminal exposure to Black stimuli evaluated a hypothetical patient's conditions as less serious compared to physicians subliminally exposed to neutral or White stimuli. Contrary to the hypotheses, I found no negative effects of explicit racial/ethnic cognitions on the diagnosis.

I also hypothesized that the negative effects of racial/ethnic cognitions on medical decisions would be stronger under high stress than under low stress. These hypotheses obtained no experimental support. However, an alternative formulation of these hypotheses, proposing that racial/ethnic cognitions affect medical decisions *only* under high stress, but not under low stress, obtained partial support. Under high stress, physicians whose implicit cognitions were activated by the subliminal exposure to Black or to Hispanic stimuli gave a less serious diagnosis than physicians subliminally exposed to White stimuli. In addition, physicians subliminally exposed to Hispanic stimuli evaluated some aspects of the patient's conditions as less serious compared to physicians subliminally exposed to neutral stimuli. Similar effects were not obtained under low stress.

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How do these findings relate to the conceptual model of racial/ethnic interaction in healthcare contexts that I proposed in the theoretical part of my dissertation? It is evident from my survey study that minority patients report receiving lower quality care when compared to White patients. These findings indicate a relationship between the endpoints of my model, i.e., patients' race/ethnicity and the quality of care, but they do not help to understand why these relationships exist. In my model, one important mechanism linking these endpoints is represented by physicians' racial/ethnic cognitions, which influence medical decisions. The experimental study explicitly focused on testing this mechanism by manipulating racial/ethnic cognitions and observing their effects on diagnostic decisions. The preliminary evidence gathered in this experiment was consistent with my model for automatic cognitions, but not for non-automatic, i.e., explicit, cognitions.

In addition, the conceptual model argued that the relationship between race/ethnicity and the quality of care is stronger, or occurs more commonly, when physicians experience high levels of stress. The survey study evaluated this argument using managed care as a proxy for stress, since other research showed that the levels of stress increase among physicians working under managed care. Consistent with the argument about the role of stress in racial/ethnic disparities outlined in my model, the survey results revealed that race/ethnicity is more commonly related to the quality of care in managed care settings compared to non-managed care settings. The experimental study provided further evidence consistent with this aspect of my conceptual model by showing that cognitions about racial/ethnic minorities, especially in their implicit forms, tend to negatively affect the medical decisions especially when the physicians are under high stress.

In summation, the survey study and the experimental study reported in this dissertation provided some, though by no means complete, support for the micro-level model of racial/ethnic interaction in health care. Both studies had multiple limitations, which make it

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prudent to consider the findings to be preliminary. Nevertheless, some patterns emerge from my results more consistently, suggesting that they merit further investigation as to whether or not they accurately reflect the underlying social processes. Among such patterns are those that pertain to implicit vs. explicit cognitions and to the role of stress. After discussing each pattern in more detail below, I will describe how the conceptual model can be revised in light of my findings for the purpose of further investigation.

Implicit vs. Explicit Cognitions

One consistent finding is that implicit cognitions contribute to racial/ethnic disparities more strongly than do explicit cognitions. The experiment revealed that unlike the implicit cognitions, explicit cognitions, activated by an explicit statement of the patient's race/ethnicity, had no negative effects of the diagnosis. In fact, some physicians who knew that the patients were Black or Hispanic advantaged these patients in their diagnostic decisions.

Do these findings mean that explicit racial/ethnic cognitions may in some cases play a positive role in health care, leading to a reversal of the disadvantage for minority patients? Such an explanation would have important consequences, since in real clinical encounters, physicians typically know each patient's race/ethnicity and this knowledge is likely to activate some explicit racial/ethnic cognitions. However, some caution is needed before advancing such an argument. The experimental findings that physicians diagnosed Blacks and Hispanics as more seriously ill compared to White or race/ethnicity-neutral patients with the same symptoms is in disagreement with a large body of literature, reviewed in Chapter 2, showing that in real healthcare settings, Blacks and Hispanics tend to receive diagnoses leading to less aggressive treatment and to overall poorer quality of health care. The results of my experiment could have been affected by the experience of accountability and social desirability bias, which perhaps prompted some participating physicians, who were aware that their responses are

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observed in relation to the racial/ethnic information, to "overcorrect" for racial/ethnic stereotypes.

According to Jennifer Lerner and Philip Tetlock (1999), the experience of accountability, which refers to the implicit or explicit expectation that one may be called on to justify one's actions to others, often results in the alignment of ones' cognitions and actions with what one believes the audiences want. Accountability effects can be triggered by mere presence of an observer or by expectations that one's performance will be assessed according to some normative ground rules. Both these conditions may have been perceived by some participating physicians, making it likely that accountability effects were present in my study, particularly among physicians who were told that they are treating minority patients.

Conformity as a coping strategy is especially likely to be used when audience views are known prior to forming one's own opinion. Lerner and Tetlock (1999) explain that "people can simply adopt positions likely to gain the favor of those to whom they are accountable, thereby allowing them to avoid the unnecessary cognitive work of analyzing the pros and cons of alternative courses of action, interpreting complex patterns of information, and making difficult trade-offs" (p. 256). Since it is plausible that many physicians expected the researchers conducting this study to view unfavorably any signs of racial/ethnic bias in medical decisions, they may have made special efforts not to appear racist. However, in real clinical encounters, when physicians are not directly observed, medical decisions disadvantaging minority patients may be more common.

The results for the implicit conditions appear more aligned with what happens when physicians see real patients, in the sense that they more correctly predict the minority disadvantage. In the implicit conditions, physicians knew that they were observed, but they did not know that racial/ethnic biases were studied. Arguably, the awareness of being observed prompted the physicians to deliver the best possible care; yet, the "best" varied in many

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instances by subliminally primed race/ethnicity. These results suggest that implicit racial/ethnic cognitions may, at least to some degree, be resistant to general, race-nonspecific, motivation to deliver high quality care.

The experimental results concerning the importance of implicit cognitions are consistent with a well-developed body of literature in cognitive social psychology, represented perhaps most poignantly by the influential paper by Patricia Devine (1989). This paper was reviewed in some detail in a previous chapter; here I concentrate on those aspects of Devine's research that help understand my findings. Importantly, Devine found that individuals high and low in prejudice, measured by attitudinal scales, are equally knowledgeable about the content of cultural stereotypes about Blacks, and that these stereotypes are equally likely to be used when these individuals cannot control such use. In contrast, explicit stereotypes are less likely to be used by low-prejudice individuals compared to high-prejudice individuals. David Schneider (2004) explains that given the opportunity to be more reflective, individuals strive to overcome their stereotypes. This explanation is consistent with my findings, which suggest that when it is impossible to reflect on the racial/ethnic stereotypes because of their automatic nature, physicians are more likely to use these stereotypes as compared to when racial/ethnic cognitions are explicit, giving the physicians an opportunity to correct for the stereotypes.

Devine used a strong assumption that because of the pervasiveness of Black stereotypes in the United States, exposure to stimuli representing Blacks should lead to the activation of automatic stereotypes about Blacks for almost everyone (Schneider 2004). Yet, other research suggests that there are individual differences in automatic stereotype use. Wittenbrink, Judd and Park (1997), for instance, primed their subjects with words "black", "white" or with neutral words and then asked the subjects to indicate whether non-words, neutral words, or words related to black stereotypes were words or non-words. On average, priming with "black" facilitated the correct response to words related to Black stereotypes while priming

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with "white" facilitated responses to words related to positive White stereotypes, but these effects were stronger for high-prejudice than for low-prejudice individuals. To Schneider (2004), Wittenbrink, Judd, and Park's (1997) results suggest that Devine's assumption about the universal activation of automatic stereotypes may not be correct.[26]

Despite the fact that my study did not measure prejudice, the findings that most physicians in the explicit condition gave a more serious diagnosis to minority patients compared to White patients with the same symptoms suggests low levels of explicit anti-minority bias (at least for such types of explicit anti-minority bias that would lead to dismissing the minority patient's symptoms as less serious). If the use (and possibly the activation) of automatic stereotypes varies with the level of prejudice, and if, as my results for the explicit condition implied, participating physicians were mainly low in prejudice, then it is plausible that the effects of the implicit racial/ethnic stimuli in my experiment were weaker compared to what could be expected if the experiment were conducted with more prejudiced individuals. Further examination of the effects of automatic cognitions by the level of prejudice may help refine the model by determining whether the effects of automatic cognitions on medical decisions are stronger among high-prejudice physicians compared to low-prejudice physicians.

Another possible explanation for more serious diagnoses being given to minority patients is the physicians' awareness of the overall poorer health status of minority individuals. The explanation that the failure to find negative effects of explicit racial/ethnic cognitions on

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[26] Schneider (2004) seems to assume that in Wittenbrink et al.'s (1997) study, the link between racial stimuli and *the activation* of implicit stereotypes varied by prejudice levels. It might also be argued, however, that the activation of stereotypes occurred universally, regardless of the level of prejudice, but *the use* of the implicit stereotypes in behavior varied by the level of prejudice, with high-prejudice individuals more likely to use the stereotypes. No studies, to my knowledge, have explored these alternative explanations. In fact, it might be difficult to do so, since automatic stereotypes, by their very nature, preclude their measurement by self-reports and necessitate the use of behavioral measures, which tend to confound the activation and use of automatic stereotypes.

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diagnosis could potentially be attributed to the growing awareness among physicians about the seriousness and pervasiveness of racial/ethnic disparities in health and in health care, and, potentially, the motivation to help reduce these disparities are encouraging. However, given sample limitations, it remains to be seen whether this increased awareness is evident in a more representative sample of American physicians, and under what conditions such an increasing awareness may lead to the delivery of equal care in real healthcare settings.

Physicians' Stress

Another finding that emerged consistently from both my studies is that racial/ethnic disparities were more common under high stress than under low stress. It was argued that when high levels of stress limit the availability of cognitive resources, racial/ethnic cognitions are more likely to affect decisions. Consistent with this argument, stress seemed to increase the racial/ethnic disadvantage in the quality of health care. In other instances, high stress was a condition for the racial/ethnic disadvantage, in the sense that this disadvantage did not occur under low stress. The indication in the data is strong that under low stress, minority patients have a good chance of receiving high quality care that is similar and occasionally even exceeds the quality of care for Whites.

These results, which are strongly suggestive that contextual factors contribute to racial/ethnic disparities in health care, resonate with the literature on contextual factors in employment discrimination, represented by the work of Barbara Reskin (2000, 2002, and 2003). Reskin developed a model specifying that some contextual factors serve as *proximate causes* of racially/ethnically disparate hiring decisions. Stress is one such contextual factor. Reskin argues that cognitive load, time pressures, multiple demands, and other forms of stress in organizational settings influence the likelihood that the decision-makers will use readily available social categories in their decisions instead of processing the information about potential hires more carefully and basing their decisions on other, more relevant,

characteristics of applicants. In addition, decision makers who do not have enough free cognitive capacity to consciously minimize the effects of cognitive biases may be more prone to use stereotypes and prejudice. It is easy to see the analogy between Reskin's model and the results of this dissertation as they pertain to the role of physicians' stress in racial/ethnic disparities in health care. Even though Reskin's research speaks to discrimination in hiring, not in health care, it corroborates the plausibility of the basic arguments advanced in this dissertation.

Revised Conceptual Model of Racial/Ethnic Interaction in Medical Care

In the light of these preliminary results, it is possible to refine the conceptual model of racial/ethnic interaction in health care that was originally proposed in Chapter 4. This revised model can than be subject to further testing in studies that overcome some of the limitations present in my studies. The revised model, illustrated in Figure 7.1, proposes that in the low-stress as well as in the high-stress healthcare settings, race/ethnicity of the patient serves as a stimulus leading to the activation of racial/ethnic cognitions. This part of the model is similar to the original model, but contains one modification -- while the original model did not specify the type of racial/ethnic cognitions, implying that both the implicit and explicit racial/ethnic cognitions might contribute to racially/ethnically disparate medical decisions, the revised model specifies that *implicit*, not explicit, racial/ethnic cognitions are at the root of healthcare disparities. The possibility that explicit racial/ethnic cognitions contribute to racially/ethnically disparate decisions among highly prejudiced physicians cannot be ruled out (in fact, it seems quite intuitive) but my data suggest that, in general, such a contribution is negligible, perhaps because of the low overall level of prejudice among physicians.

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Figure 7.1. Revised conceptual model of micro-level mechanisms in racial/ethnic interaction in high-stress and low-stress healthcare settings.

Low stress health care settings:

race/ethnicity ──▶ implicit racial/ethnic cognitions ─ ─ ─▶ medical decisions ──▶ quality of care

High stress health care settings:

race/ethnicity ──▶ implicit racial/ethnic cognitions ──▶ medical decisions ──▶ quality of care
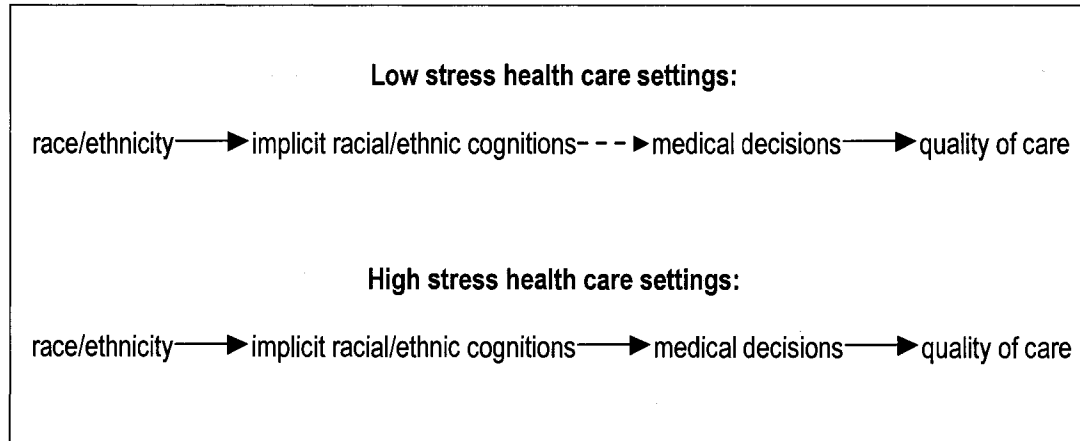
The major model modification pertains to the relationship between the racial/ethnic cognitions and medical decisions in low stress settings. The original model specified in Chapter 4 suggested two alternative formulations of the hypotheses about stress. The first formulation proposed that the magnitudes of racial/ethnic disparities were larger under high stress than under low stress. This formulation implied that racial/ethnic gaps in the quality of care occurred both in high stress and in low stress environments, but that these gaps were wider under high stress than under low stress. The alternative formulation proposed that racial/ethnic gaps in the quality of care existed only in high stress environments, but not in low stress environments. The latter formulation is more consistent with the results of my survey and experimental studies.

To reflect this finding, a dashed line in the revised model problematizes the relationship between implicit racial/ethnic cognitions and medical decisions in low stress healthcare settings. This relationship may be weak, or, in some situations, may not exist at all. In such ideal situations, the causal chain connecting patients' race/ethnicity and the quality of health care is effectively interrupted. Consequently, in these situations, we should no longer observe

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the minority disadvantage in the quality of health care that stems from racially/ethnically disparate medical decisions.

Implications of Healthcare Trends for Racial/Ethnic Disparities

One prominent finding of this study is that physicians' stress and stress-inducing organizational characteristics, such as managed care cost-containment policies, contribute to racial/ethnic disparities in health care. Since the characteristics of individual healthcare organizations are shaped by regional and national healthcare trends, it is important to consider these trends so that we can better understand their implications for the racial/ethnic disparities in the quality of care.

During the past two decades, managed care policies became common in American healthcare organizations. Based on the data used for my survey study, about 30 percent of privately insured Americans were enrolled in plans using capitation, and about 60 percent were enrolled in plans using gatekeeping by late 1990's. Managed care made health care more affordable, but it also spurred a powerful backlash, both from the side of dissatisfied consumers and from the side of physicians, who complained about time pressures, lack of clinical autonomy, and financial strain. Consumers started to demand more choices in their health care. Physicians pushed for higher payment rates, less risk sharing, and lighter administrative load. According to the Center for Studying Health System Change (2001b), managed care backlash had come to full bloom in the late 1990's.

In response to this backlash, many healthcare plans have moved away from managed care strategies. The general trend has been to eliminate one or more supply-side cost-containment strategies, such as capitation, gatekeeping, pre-authorization requirements, or delegation of the administrative responsibilities to physicians. In the late 1990's and early 2000's, high healthcare costs, which fueled the managed care revolution in the first place, have continued to increase, often more steeply in plans that have loosened the managed care

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constraints. By 2002-2003, this trend has led some healthcare plans to reintroduce previously eliminated strict administrative controls (Draper and Claxton 2004). Plans are not, however, returning to blanket pre-authorization requirements but focus instead on services that have a high risk of misuse, on high-cost services, and on high-cost patients.

At the same time, plans have started to experiment with new tools, such as encouraging physicians to select cost-efficient hospitals for their patients, encouraging patients to select cost-effective providers, and introducing tiered provider networks, in which health plans group their providers into tiers based on the prices they charge for their services. One common theme in many of these innovations is shifting the financial responsibility to consumers. Compared to managed care, which boasted a relatively generous benefit structure (typically no deductibles, low co-payments and expanded coverage for preventive services), newer plans tend to feature higher deductibles, higher co-payments, and coinsurance fees (Trude 2003).

What impact can we expect of these innovations on the quality of care for minority patients? First, since out-of-pocket healthcare expenses are increasing, it is likely that access to health care will become more limited for financially disadvantaged groups, including many minorities. The inequalities may increase especially for high-quality healthcare services. Since high-quality care often requires expensive technical equipment and highly trained staff, it tends to be costly. Costly, technically demanding diagnostic and treatment procedures may become inaccessible to low-income patients who will not be able to afford them.

One might also expect that consumer cost sharing will bring some changes in the ways healthcare providers influence the quality of care for members of different racial/ethnic groups. Shifting financial responsibility for the health care to consumers does not mean that consumers suddenly become medical experts, ready to independently make sophisticated decisions about their care. Patients will still rely on their physicians to help them understand the advantages and disadvantages of their diagnostic and treatment options, and to select the most appropriate

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option. The appropriate option may mean the affordable option for many patients. If physicians are aware that cost is a factor, they may adjust their advice based on what the patient appears to be able to afford and their stereotypes regarding the socioeconomic status of different racial/ethnic groups may play a role in this process.

The following example of how such a process might work is inspired by a statement by John Bertko, an executive at a large insurer and a panelist at a conference on consumer cost sharing held in December 2003. Bertko said,

> "Patient cost sharing will also vary by type of service. Imaging services, for example, might have higher cost sharing than office visits, with an aim of reducing inappropriate use of new technology. [...] For example, a patient might choose between a less costly X-ray and more expensive magnetic resonance imaging (MRI) for a joint problem" (Trude and Grossman 2004, p. 2).

In this scenario, a physician seeing a Black patient with a joint problem might give the patient a choice between X-ray and MRI. The patient, unsure which option would be more appropriate, asks the physician for advice. The physician, considering that the patient is Black, may suggest the more affordable X-ray first to reduce the financial burden on the patient. Since the X-ray fails to reveal any joint damage, the physician sends the patient home with a prescription for Motrin and a recommendation to ice the joint. These treatments do not help, and the patient comes back in a few months after her condition has worsened. The physician then recommends the more expensive MRI, which reveals joint damage requiring surgery. In contrast, when seeing a White patient with a similar joint problem, the physician may advise right away the more expensive MRI. The White patient receives the appropriate treatment faster, which may increase her chances of full recovery and result in higher satisfaction with her care.

Since racial/ethnic biases among physicians seem especially likely to affect the quality of care when physicians are under stress, it is also important to consider the potential effects of healthcare trends on physicians' time constraints and other potentially stressful job factors.

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One of the hopes has been that healthcare organizations that abandon tight managed care constraints will enable physicians to spend more time with their patients. Yet, recent evidence does not show any decline in time pressures experienced by physicians nationwide. Sally Trude (2003) reports that despite the fact that between 1997 and 2001, the time on direct patient care increased from 81 percent to 86 percent, physicians are feeling more time pressure than before. In 1997, 29 percent of physician reported they had inadequate time to spend with their patients. In 2001, this figure rose to 34 percent. One potential reason for this trend is that with increasingly complex diagnostic and treatment options, patient care is becoming increasingly time-consuming, and physicians may feel that to properly attend to each individual case, they need more time with their patients than allotted. Sally Trude (2003, p. 3) explains:

> "Medical advances mean more treatment options are available to more patients. People are living longer with chronic illnesses that may require more complex coordination with other caregivers. With more diagnostic and treatment options available, physicians' increased time in direct patient care may reflect more time spent on patient care activities other than face-to-face visits with patients. A growing list of recommended preventive services also may be consuming primary care physicians' time with patients ... if doctors followed all government recommendations aimed at preventing disease and injury, they would spend more than seven hours a day on the standards. Physicians may be frustrated by having too much to discuss with their patients in too little time."

The consumer cost sharing may contribute to the effect of "having too much to discuss in too little time." Medical decision making shared by the patient and the physician, which, in an ideal case, consumer cost sharing would promote, is time consuming. The physician-patient discussions may be complicated since in addition to medical advantages and disadvantages of each medical option, patients and physicians must consider the burden of expenses that the patient would face with each option. If the patient is poorly educated, as many minority patients are, such a complex decision-making process may be even more time consuming for the physicians and the patient. It this sense, consumer cost sharing might lead to longer visits or to exacerbated time pressures if the length of the visit is limited.

Several trends in the physician workforce support the argument that recent organizational changes in health care have increased the levels of job-related stress among physicians. First, there is some evidence that an increasing percentage of physicians is leaving medicine. The decision to leave medicine or to cut the number of hours with patients to less than 20 a week is strongly related to physician dissatisfaction (Landon et al. 2006). Second, there is a continuing decline in charity care, which is another sign of increasing time and financial pressures on physicians. The percentage of physicians providing free or reduced cost care declined from 76 percent in 1996-1997 to 68 percent in 2004-2005 (Cunningham and May 2006). Despite the long tradition of charity in American medicine, physicians may no longer have as much time as before to donate to their most needy patients. Finally, there is a trend toward an increase in physician entrepreneurial activities that supplement physicians' traditional practices. Hoangmai Pham et al. (2004) explain that this trend is a result of increased financial pressures. During the managed care era, the annual growth in physicians' incomes has been lagging behind the annual growth in incomes of other professionals. Some frustrated physicians have started increasing the volume and cost of services in an entrepreneurial fashion to supplement their incomes. The increase in the volume of services may mean that physicians are working *more*, not less, and arguably experience greater stress related to their work schedule. If, as I contended, these three types of trends are associated with increasing stress levels among physicians, the growth in racial/ethnic disparities in the quality of care (or at least their failure to decline) could be a consequence.

In summation, there are some indications that current healthcare trends may contribute to the stratification of the quality of care by race/ethnicity. Changes in the healthcare system may make high quality care increasingly inaccessible to minority patients, and may exacerbate job-related pressures experienced by physicians that may contribute to racial/ethnic stereotyping and bias. These aspects of the healthcare trends could potentially counter some of

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the positive changes associated with the growing awareness about racial/ethnic disparities in health care.

Reducing Racial/Ethnic Disparities: Is There Hope?

Efforts to reduce racial/ethnic disparities in healthcare have been ongoing for several years, but, regrettably, they have had limited success. Counter forces stemming from healthcare system changes, described in the previous section, may constitute one reason why these efforts have not been more successful. The limited understanding of the micro-level mechanisms leading to disparities may be another, perhaps even harder to overcome, obstacle to more equal health care. In this section, I explore whether the contribution of these micro-level mechanisms to racial/ethnic inequalities can be reduced.

Early students of implicit social cognition tended to assume that since implicit processes occur outside of consciousness, they are impervious to the perceiver's intentions and goals. In fact, some researchers suggested that implicit cognitive processes are inescapable. Patricia Devine, for instance, argued, "A crucial component of automatic processes is their inescapability; they occur despite deliberate attempts to bypass or ignore them" (1989, p. 6). If assumptions about the inflexibility of implicit social cognitions are correct, and if, as my research suggests, implicit cognitions contribute to racial/ethnic disparities, there would be little hope for change, short of a sweeping change in the content of widely held cultural beliefs. Based on the review of the trends in the content of racial and ethnic stereotypes, presented in Chapter 3, such broad cultural change seems eventually possible, but also inevitably slow.

Happily, more recent scholarship has problematized the assumption of the inflexibility of implicit cognitions. Plentiful evidence has emerged that implicit social cognitions respond to motivational and situational factors. Irene Blair (2002) reviews nearly fifty experimental studies to this effect. This evidence suggests that individuals can modify the automatic operation of their stereotypes and prejudice if they are highly motivated to preserve their self-

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image or to appropriately respond to social demands of a situation. Blair (2002, p. 248) explains, "Whites may temper their automatic prejudice during (or while anticipating) a social interaction with a Black person, especially if they are in a subordinate position (Lowery, Hardin, and Sinclair 2001). They may also moderate automatic stereotypes if those stereotypes appear to be discrepant with social norms." According to Susan Fiske (1998), other motives potentially influencing stereotyping, some of which have been shown to play a role in automatic cognitions, include belonging, understanding, controlling, and trusting.

Stereotype suppression is one common method people use if they are motivated to resist stereotypes. However, evidence is inconclusive on how successful this method is. Some studies showed that suppression fails to reduce automatic stereotypes and may even backfire and magnify them because it increases their salience (Galinsky and Moskowitz 2000, Macrae et al. 1994). Other studies show that suppression strategies can be successful, but their success depends on specific intentions (Gollwitzer and Schaal 1998) or on extensive practice (Kawakami et al. 2000). Other strategies, such as expecting counter-stereotypic events, or focusing on counter-stereotypic group members, can also affect stereotypical responses. Irene Blair (2002) cautions, however, that the likelihood of successfully reducing stereotypes in everyday life is not yet known.

Assuming that conscious effort to reduce implicit stereotypes can be successful in real life, can we expect physicians to make this effort while they are treating minority patients? One condition on the part of physicians is their awareness of racial/ethnic disparities in American health care and of the role individual biases can play in them. Encouragingly, my results suggest that physicians may be increasingly aware of racial/ethnic disparities (if not in health care, then at least in health), and may be motivated to help reduce them. Providing high-quality, bias-free care is certainly among the cornerstones of many physicians' professional ethics. Continuing to raise physicians' awareness of the existence of racial/ethnic biases seems

desirable, since it may help motivate physicians to strive to provide more equitable care. It may be important to educate physicians about the fact that some cognitive biases are operating outside of consciousness, and that they are especially likely to affect their decisions when they are busy, stressed or multitasking.

However, my research, together with some other experimental evidence on automatic stereotyping, suggests that education and motivation are not sufficient for overcoming racial/ethnic biases. Contextual factors must also be addressed if appreciable and lasting reduction in disparities is to be achieved. Alleviating time pressures is perhaps the most important measure that organizations can take to help physicians reduce the inappropriate use of non-medical information in their medical decisions. With adequate time, physicians can attend in detail to relevant information, instead of having to (perhaps unconsciously) resort to heuristic devices such as social categorization. In addition, with plentiful cognitive resources and time available, physicians could engage in conscious effort to counter stereotypes and bias (see Bodenhausen et al. 1998), either by suppression, or by attending to counter-stereotypical information. As Irene Blair and Mahzarin Banaji (1996) pointed out, any explicit strategy takes time, along with motivation, to implement.

Barbara Reskin (2003) proposed several other interventions on the level of organizations that could help to reduce social inequalities. Even though Reskin referred to employment discrimination, some of her strategies may have similar inequality-reducing effects in health care. One such strategy is making high-quality information about "targets" available to decision makers. Referring to the research by Bodenhausen et al. (1998), Reskin argues that ambiguous information makes stereotypes and in-group preferences more influential. Giving physicians access to high-quality information is obviously desirable in any healthcare environment, but may be especially beneficial for physicians treating minority patients, especially under high-stress situation.

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Increasing the degree to which decision makers can be held accountable for potential discrimination is another strategy proposed by Reskin (2003). Recent controversy about whether or not to make recording patients' race mandatory in public health care highlights the fact that not all healthcare organizations keep data on race and ethnicity of their patients. In fact, some may consider it inappropriate precisely because such information could be misused. From the point of view of physicians' accountability, however, keeping information on patients' race/ethnicity seems desirable. While such record keeping might make race and ethnicity salient to physicians (not a desirable effect from the perspective of social psychology), it might also remind physicians to consciously strive to provide the best possible care for minority patients. In an ideal case, record keeping would have a similar effect as the explicit statement of patients' race/ethnicity had in my experiment, and *increase* rather than decrease the quality of care for minority patients.

Finally, Reskin (2002, 2003) suggests that discrimination may be reduced by bureaucratization, formalization of practices, reducing the decision makers' discretion, and requiring that decision makers use formal decision criteria. These strategies are problematic in the context of health care. Managed care has used some of these strategies in an effort to reduce healthcare cost, but they lead to physician dissatisfaction and stress. Given my findings concerning the harmful effects of stress, the negative outcomes of such strategies would probably far outweigh any of their benefits.

In contrast, some newer types of formalization, such as physician compensation schemes based on the physicians' adherence to quality guidelines, are potentially more beneficial. These programs, sometimes referred to as "pay for performance," seek to motivate physicians by *rewarding* them for delivering high quality care (Bodenheimer, May, Berenson, and Coughlan 2004). These programs are still in their infant stages and they have not been widely implemented. It remains to be seen whether they will affect physician stress levels, and

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whether, by financially motivating physicians to deliver high quality care to *all* patients, they will help reduce racial/ethnic disparities in the quality of care.

The Promise of Meso-Level Strategies

One conclusion of this dissertation is that context may matter for racial/ethnic disparities in the quality of health care. Stressful contexts, whether induced experimentally by manipulating time pressure, or represented by managed care cost-containment policies that place productivity pressures on physicians, exacerbated racial/ethnic gaps in some aspects of the quality of care. These findings are preliminary, but if they get corroborated in future studies, they would suggest that simply putting physicians in a less stressful context might, at least to some degree, help mitigate the problem of disparities. I argue that context-based, meso-level strategies may hold special promise for helping reduce racial/ethnic inequalities in health care.

Individual-level strategies, such as suppression and counter-stereotyping, were also briefly explored in this chapter. The problem with these strategies is precisely that they are individual-level – they require individuals to be motivated and to make a conscious effort to overcome their biases. Individual-level motivation is not always easily generated, especially if there are no clear external incentives. Also, even among highly motivated individuals, micro-level strategies to counter stereotyping and bias are not always successful.

On the other extreme are macro-level strategies. I noted that widely held cultural beliefs that constitute the foundation of social cognitions evolve over historical time. The evolution of racial/ethnic beliefs, however, is much slower than some observers expected several decades ago, when complete eradication of racism in America seemed within reach. Education is obviously one strategy that may help change the cultural beliefs contributing to racial/ethnic and other social disparities, but the tenacity of these beliefs, despite educational and other efforts, should not be underestimated (see Ridgeway, Boyle, Kuipers, and Robinson 1998).

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Meso-level strategies, such as those targeting the contexts in which physicians deliver care, appear to be more useful than macro- and micro-level interventions. They are not dependent on individual motivation or other hard-to-control individual factors, neither are they constrained by relatively stable macro-level social patterns. Organizational contexts can help activate or suppress social and cognitive processes, and thus permit or counter the mechanisms leading to poorer quality of care for minority patients. This dissertation suggested that stress reduction is one strategy that organizations can take to combat racial/ethnic disparities in the quality of care, but there are potentially other context-based strategies that yet need to be identified. Future research into the mechanisms connecting patients' race/ethnicity to the outcomes of health care is needed before we will be able to design and use such strategies to create healthcare contexts that help successfully deliver high-quality healthcare services to all patients, regardless of their race/ethnicity.

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APPENDIX A

Contact Letter

Dear Dr. [insert last name]:

I am a doctoral candidate in Sociology at Stanford University. My name is Irena Stepanikova. I would like to ask for your help with my dissertation research of how physicians make decisions when they have limited time.

THE STUDY TAKES ONLY ABOUT 10 MINUTES

Many family physicians and general practitioners are pressed for time, but little is known about what these conditions mean for physicians like you. You can help create this knowledge, which is important for organizations and policy makers who help doctors to deliver high-quality care to all their patients. This study asks questions about hypothetical patients and yourself. For some participants, it begins with a short concentration exercise.

TO START, click on the link below or paste it into the address window of your Internet browser:

[Internet address stated here]

For technical reasons, if you have a choice, I recommend using the Mozilla Firefox browser (available at http://www.mozilla.org).

For the study to work properly, it is very important that you are NOT interrupted during the concentration exercise and while answering questions about the patients. Please set aside about 10 minutes when you can fully concentrate and avoid any interruptions.

You are a part of a carefully selected sample that represents family physicians and general practitioners across the US and your response is needed if this study is to be successful. I plan to do several follow-ups with non-respondents by mail and phone. It is only with your generous help that my research can be successful. To say "Thank you", I will have a lottery for a $500 prize for participants. You can enter as you finish the survey.

Please feel free to contact me or my Dissertation Chair, Professor Karen Cook, Ray Lyman Wilbur Professor of Sociology, with any questions. My contact information appears below. Professor Cook's phone is [phone number stated here] and her email is [email address stated here].
Sincerely,

Irena Stepanikova

[Address, phone number and email address stated here]

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APPENDIX B

Description of Patient 1

Patient 1: 62-year-old female. Insurance: BlueCross–Blue Shield PPO.

Chief Complaint: Dull intermittent pain in left chest and left anterior shoulder.

History of Present Illness: Pain had gradual onset about a year ago. It is present both at rest and exertion. Worsened by exertion. Not worsened by deep breath, change in position, or movement. Pain intensified in the past two weeks. No abdominal pain. No vomiting. No diarrhea.

Medical History: Previous medical history unremarkable. No diabetes.

Family/Social History: Father had myocardial infarction at the age of 70. Patient started smoking by age 20 (a pack a day) but quit smoking 1 year ago due to feeling shortness of breath.
Divorced. Works full time. Helps to provide childcare for her grandson. Drinks moderately.

Medication: No medications at present. No known allergies.

Vital Signs: Temperature 36.5; pulse 75; blood pressure 141/84.

Diagnostic Tests: Electrocardiography: Nonspecific T-wave changes. Exercise EKG stress test indicates possible mild ischemia.
Blood cholesterol: Low-density lipoprotein (LDL): 152 mg/dl; high-density lipoprotein (HDL): 52 mg/dl.

Observations: Patient seemed anxious and impatient in the beginning of the consultation. She said she missed a previous appointment and then had trouble rescheduling it. While waiting for her new appointment, her pain worsened, which made her concerned. She was also worried about her family history (father's heart attack). Toward the end of the consultation, she asked the physician if there are other tests or medications that she should get, and had the physician re-iterate the reasons for the original recommendations several times. She said she was frustrated because she did not understand everything that was said to her, but she still walked away from the visit seeming more reassured.

APPENDIX C

Description of Patient 2

Patient 2: 44-year-old female. Insurance: Aetna PPO.

Chief Complaint: Intermittent lower back pain with radiation to the right hip and buttock.

History of Present Illness: The pain began about 1.5 years ago when the patient lifted a heavy box when moving.
No abdominal pain. Bowels and bladder are functioning normally.

Medical History: Previous medical history unremarkable.

Medication: Patient presently takes aspirin or ibuprofen (3-6 tablets a day) for pain relief but complains that pain persists despite medication use.
No known allergies to medication.

Vital Signs: Temperature 36.5; pulse 65; blood pressure 120/78.

Physical Exam: Patient is tender to palpation over the right lower lumbar area, and has pain in the right back, buttock, and posterior thigh with straight leg raising to 45 degrees. Sensation to touch and pinprick, muscle strength, and reflexes are normal.

Diagnostic Tests: X-ray: Mild degenerative changes in the lumbar spine.

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