INCOME INEQUALITY AND RACIAL/ETHNIC INFANT MORTALITY IN THE UNITED STATES

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The objective of this study was to examine if intra-racial income inequality contributes to higher infant mortality rates (IMRs) for African-Americans. The conceptual framework for this study is derived from Richard Wilkinson’s psychosocial environment interpretation of the income inequality and health link. The hypotheses examined were that race/ethnicity-specific IMRs are influenced by intra-race/ethnicity income inequality, and that these effects of income inequality on health are mediated by level of social mistrust and/or risk profile of the mother. Using state-level data from several sources, the 2000 National Center for Health Statistics Linked Birth Infant Death database, 2000 U.S. Census, and 2000 General Social Survey, a number of regression equations were estimated. Results indicated that the level of intra-racial/ethnic income inequality is a significant predictor of non-Hispanic Black IMRs, but not the IMRs of non-Hispanic Whites or Hispanics. Additionally, among Blacks, the effect of their intra-racial income inequality on their IMRs was found to be mediated by the risk profile of the mother, namely, the increased likelihood of smoking and/or drinking and/or less prenatal care by Black women during pregnancy. Implications of the findings are discussed.
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CHAPTER I
INTRODUCTION

Project Description and Purpose

Over the last few decades, infant mortality rates (IMRs) in the United States (US) have steadily declined for all racial/ethnic groups with an exception for the first time in 2002, when these rates increased slightly (CDC, 2006). One of the most striking facts about the IMR trend is that Black non-Hispanic infant deaths have consistently been higher relative to other racial/ethnic groups. For example, in the 1995-2002 time period the infant mortality rate for non-Hispanic Whites was 5.9, for Hispanics it was 5.8 and for non-Hispanic Blacks it was 13.9 (MMWR Weekly Report, June 10, 2005). The persistent Black infant health disadvantage is perplexing and perhaps one of the biggest challenges to realizing the Healthy People 2010’s goal of eliminating health disparities among different segments of the population (US Department of Health and Human Services, 2005). Particularly puzzling is the Black non-Hispanic disadvantage in infant health compared to Hispanics, despite the two racial/ethnic groups’ similarities with respect to socioeconomic indicators (Martinez, 1996).

This dissertation used secondary data from three sources: the 2000 period linked birth/infant death (LBID) files compiled by the National Center for Health Statistics (NCHS)(CDC, 2007), the 2000 US Census (US Census Bureau, 2007), and the General Social Surveys 1972-2002 Cumulative File (Davis, Smith, & Marsden, 2003). These data were used to conduct a state-level analysis of racial/ethnic-group specific IMRs.
The major research question of this study was: does income inequality contribute to the higher IMR for Blacks?

Statement of the Problem

Research on infant mortality in the past has focused on the roles of socioeconomic status (SES), geographic location such as metro/rural urban, or accessibility and availability of medical care (Brooks, 1975; Guest, Almgren, & Hussey, 1998; Kirby, 1993; Kitagawa & Hauser, 1973; Mansfield, Wilson, Kobrinski, & Mitchell, 1999; Markides, & Barnes, 1977; Pappas, Queen, Hadden, & Fisher, 1993; Stockwell, Goza, & Balisteri, 2005). While SES has been found to be a significant determinant of health outcomes, a growing body of recent international and country-level research is arguing that health, in general, and infant health, in particular, are not only affected by levels of absolute income, they are also affected by economic inequality (Flegg, 1982; Kennedy, Kawachi, & Prowthrow-Smith, 1996; Hales, Howden-Chapman, Salmond, Woodward, & Mackenbach, 1999; Shi, Macinko, Starfield, Xu, Regan, Politzer, & Wulu, 2004; Waldman, 1992; Wennemo, 1993). Rodgers (1979) and Wilkinson (1996, 1997) are among the pioneers in this line of research, showing a relationship between country-level income inequality and health, and suggesting that for rich countries relative poverty rather than absolute poverty is the stronger predictor of health outcomes.

The health outcomes that have been examined by “inequality-health” researchers include all-cause mortality, cause-specific mortality, morbidity, self-rated health, and infant mortality. Interestingly, the stronger evidence for the economic inequality perspective comes from infant mortality studies. Because of the short time lag between exposure and outcome, infant mortality may be more directly affected by inequality than
other health indicators (Lynch et al., 2004; Lynch, Harper, Kaplan, & Smith, 2005).

Compared to other countries, stronger evidence for the inequality-health link also comes from US studies. According to Wilkinson’s review (Wilkinson & Pickett, 2005), out of 25 studies that supported the income inequality hypothesis, 17 were from the US.

Explanations for stronger evidence of the link from studies within the US include the less egalitarian income distribution in US compared to many other wealthy nations (Subramanian & Kawachi, 2004). Indeed, the income gap in the US increased during the latter part of the twentieth century (Nielsen, Alderson, & Beckfield, 2005).

Interestingly, at the same time, peoples’ social affiliations, their trust in others, and their perceptions of the fairness and helpfulness of others tended to decline (Kawachi, Kennedy, Lochner, & Prothrow-Stith, 1997; Marmott & Wilkinson, 2001). The health effects of widening inequality and the role that declining social trust potentially plays are receiving recent attention of sociologists, economists, as well as epidemiologists (Lynch, Smith, Kaplan, & House, 2000; Mullahy, Robert, & Wolfe, 2004; Wagstaff & Van Doorslaer, 2000).

An underlying assumption of the link between economic inequality and health is that economic inequality generates a sense of social deprivation, which contributes to poor health by exposing the most relatively disadvantaged individuals to higher psychosocial risk factors (Kaplan, Pamuk, Lynch, Cohen, & Balfour, 1996; Kennedy, Kawachi, & Prothrow-Stith, 1996; 1997; Lynch, Davey-Smith, Kaplan, & House, 2000; Muller, 2002; Wilkinson, 2006, 1992, 1994, 1995). Chronic stress can affect the cardiovascular and immune systems and increase susceptibility to diseases (Thoits, 1995; Wilkinson, 2006). In addition to the direct effects on immune system, chronic
stress contributes to the likelihood of increased behavioral risk factors, such as smoking, excessive drinking, no exercise, and drug abuse (Wilkinson, 2006).

The harmful social consequences of relative deprivation have best been addressed in the criminology literature where a number of studies have shown that violence and crime are directly related to inequality in society (Blau & Blau, 1982). Many of these studies have emphasized the role of within-race or intra-racial inequality as a significant source of relative deprivation and crime or violence (Harer & Stefensmeier, 1992). The reference group for a racial/ethnic population might not be the majority or everyone else in society, rather members from their own group. Based on this line of argument, it is possible that health outcomes of racial/ethnic groups are affected by their within-race inequality or deprivation.

Due to the lower social status in society the effects of income inequality are more likely to be stronger for the least well off in society (Gerdtham & Johanneson, 2000), and more specifically for Blacks (Harer & Steffensmeier, 1992; Shi & Starfield, 2001) and other disadvantaged racial/ethnic groups. The fact that psychosocial costs of deprivation and low social status due to relative income inequality are related to a wide range of social pathologies such as crime, violence, and adolescent births has been supported by numerous studies (Harer & Steffensmeier, 1992; Pickett, Mookherjee, & Wilkinson, 2005; Stolzenberg, Eitle, & Stewart, 2006;). To what extent psychosocial deprivation and income inequality contribute to the health disparities of the racial/ethnic groups is still an under-researched topic.

This current study assumes that individuals’ relative deprivation does not necessarily result from their comparison with everyone else in the society, rather it
results from the comparison with the members of their own racial/ethnic group with whom they are most likely to associate. This current study, therefore, examines whether the higher infant mortality rates of the African Americans are due to the relative deprivation caused by level of within-race or intra-racial income inequality.

Research Questions

The major objective of this dissertation was to examine whether intra-racial income inequality helps explain the higher mortality of Black infants compared to other racial/ethnic groups. The specific research questions were: (1) Does intra-racial/ethnic income inequality contribute to racial/ethnic-specific infant mortality? And, if so, (2) what are the factors that mediate the income inequality and infant mortality link?

Conceptual Framework and Hypotheses

The conceptual framework for this study is derived from the income inequality hypothesis (Wilkinson, 1992) which argues that mortality rates of developed countries are impacted more by relative than absolute living standards. According to this perspective, the more egalitarian the income distribution is, the better the health of the population. Wilkinson shows that after controlling for a number of socioeconomic factors, including average income and absolute level of poverty, mortality tends to be lower in more egalitarian societies. There are two different explanations of how income inequality affects health: psychosocial and neo-material. Wilkinson is one of the proponents of the psychosocial interpretation.
According to the psychosocial environment interpretation, income inequality affects health through psychosocial pathways. Economic inequality creates a sense of relative deprivation and stress among the people with lower status in society. Income inequality elevates stress through depriving people of nutritious food, adequate shelter, safe work environment, and friendly neighborhood, and increasing stress, depression, hostility, hopelessness, and lack of self-control (Wilkinson, 1996). The concept of “social capital” has been used by some researchers to demonstrate the psychosocial mechanism. Greater income inequality decreases social cohesion and increases social divisions, and thereby negatively affects health. Trust and belonging, which are components of social capital and social networks, have been found to be associated with mortality rates (Kawachi et al., 1997; Neil & Davey, 2003).

While proponents of the inequality-psychosocial-health link emphasize factors such as increased stress or lower level of social mistrust due to higher income inequality, the proponents of the neo-material perspective of the inequality-health link focus on inequitable access to resources due to inequality. In other words, the neo-materialists argue that it is the differential distribution of resources across the life course that makes people at lower strata vulnerable to health risks. Kaplan et al (1996) indicated a “potential pathway” between income inequality and health where income inequality is associated with factors like unemployment and work disability, lower insurance coverage, educational achievement, social welfare, and medical expenditure.

However, Wilkinson and other psychosocial proponents reject the neo-materialist perspective complaining that their description of neo-material factors “seems to embrace everything but the genome” (Marmot & Wilkinson, 2001, p. 1234). According to
Wilkinson and Marmot, the psychosocial effects of inequality go much further than the
direct effects of material conditions. Even if material conditions improve (such as every
child gets a computer, every household has access to an automobile, and air pollution
decreases), the problem would not be solved. Dismissing the validity of the neo-
materialists’ explanation, they argue that the psychosocial effects of relative deprivation
would still remain untouched.

Hence, using state-level data, this dissertation explored the psychosocial link
between racial/ethnic-specific infant mortality rates and intra-racial/ethnic income
inequality. In order to investigate whether intra-racial/ethnic income inequality affects
racial/ethnic-specific infant mortality, and, if it does whether the mediators are
psychosocial in nature, this study tested the following hypotheses:

H1: All else equal, the racial/ethnic-specific IMR will tend to be higher in areas where the
level of inequality within the racial/ethnic group is higher.

H2: All else equal, the effect of intra-racial/ethnic income inequality on racial/ethnic-
specific infant mortality is mediated through the level of social mistrust in the
racial/ethnic group.

H3: All else equal, the effect of intra-racial/ethnic income inequality on racial/ethnic-
specific infant mortality is mediated through the risk profile of mothers in the
racial/ethnic group, namely, the percentage who used late or no prenatal care,
engaged in smoking, and/or consumed alcohol while pregnant.
Organization of the Dissertation

In sum, guided by Wilkinson’s psychosocial perspective of the inequality and health link, this study examined the effects of intra-racial/ethnic income inequality on race/ethnicity-specific IMRs. Chapter II discusses prior research on the topic and provides a more detailed presentation of the theoretical model used to ground the analysis of the study’s three hypotheses. Chapter III describes the data sources, variables, and methods of the study. Chapter IV presents the results and relates them to the three hypotheses. Chapter V discusses the findings. Finally, Chapter VI includes a summary of the study’s findings, limitations, and policy implications, as well as potential directions for future research.
CHAPTER II
THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

The objective of this study is to examine if intra-racial income inequality contributes to higher infant mortality rates (IMRs) for non-Hispanic Blacks. The first section of this chapter considers how inequality has been addressed in some major sociological theories. Although it is not until very recently we see a growing interest in income inequality and its effects on health, social scientists have long been writing about its other detrimental effects. That relative deprivation is harmful for individual and society has been demonstrated in the writings of almost all the pre-classical social thinkers as well as the founding fathers of sociology. The second section of the chapter describes the theoretical framework used in the dissertation, specifically Richard Wilkinson’s income inequality hypothesis (1992) which argues that mortality rates of developed countries are impacted more by relative than absolute living standards. The third section of the chapter reviews the literature on infant mortality, with a specific focus on its relationship with income inequality. The chapter concludes with a summary and the presentation of the three hypotheses examined in the study.

Income Inequality in Sociological Theories

Inequality and its social consequences have been central themes in many major sociological theories. The founding fathers of sociology were concerned with the advent of industrial society and the breakdown of traditional social norms, declining social
integration, increasing heterogeneity, widening social gaps, and the growing anomie.

Even the pre-classical social thinkers warn us about the harmful consequences of inequality in society and express their thoughts about to what extent inequality could be tolerated in society. For example, Plato believed that no citizen should be permitted to possess more than five times the size of the smallest one. Aristotle, although convinced of the inevitability of inequality, admitted that it is the source of conflict and crime, “The greatest injustices are committed out of excess……” (1962, p. 68). Aristotle, therefore, suggested the “social mean” as a solution. Hobbes (1668) strongly believed that the inequality of subjects can even cause ruin of the Commonwealth, “Impunity maketh insolence; insolence hatred, an endeavour to pull down all oppressing and contumelious greatness, though with the ruin of the Commonwealth” (Leviathan xxx, p. 16).

Although Marx’s theory is popularly identified as a materialistic theory, Marx was aware of the psychosocial effects of relative deprivation on the workers, too. He argued that workers may feel relative deprivation even though when they are not absolutely poor. In Wage Labor and Capital (1847) he explained that as a consequence of rapid growth of productive capital, there might be a rise in wages. But it does not necessarily mean that workers will be happier, because they may feel even less content because of the social pressure of having more. So, at any given stage of development of society, the worker will always be poorer compared to the capitalists. Therefore even with the increase of pleasure the worker’s social gratification will continue to fall when compared with the increased gratification of the capitalist. In Marx’s words, “Our wants and pleasures have their origin in society, we therefore measure them in relation to society, we do not measure them in relation to the objects which serve for their
gratification. Since they are of a social nature, they are of a relative nature” (Marx, 1847, p.33).

Marx’s writings demonstrate that relative deprivation is an inherent characteristic of any capitalist society, which contributes to increased stress, frustration, and a sense of lack of control among the individuals of the working class. In Wage and Capital (1874) he writes,

A house may be large or small, as long as the neighboring houses are likewise small; it satisfies all social requirements for a residence. But let there arise next to the little house a palace, and the little house shrinks to a hut. The little house now makes it clear that its inmate has no social position at all to maintain, or but a very insignificant one; and however high it may shoot up in the course of civilization, if the neighboring palace rises in equal or even in greater measure, the occupant of the relatively little house will always find himself more uncomfortable, more dissatisfied, more cramped into his four walls (Marx, 1874, p.32).

That the capitalist economic system is bound to create widening social inequality was undoubtedly stated in all of Marx’s writings. In Capital, Vol. 1 (1867), Marx examines the underlying dynamics of the capitalist system. According to his “labor theory of value,” profit comes from the extra hours of work for which the worker is not paid. The more “surplus value” the worker produces, the richer the capitalist gets. As capitalism advances, inequality widens and society becomes polarized into two opposing classes: the capitalists and the proletariat. According to Marx, the capitalist system is the most alienated of all. The workers sell their own labor as a commodity, cannot have any meaningful relations with other human beings, and virtually become cogs in a machine.

Emile Durkheim, one of the proponents of functionalism, throughout his writings attempted to prove that social solidarity is the fundamental basis of social order.
Durkheim was motivated to explain how the normative breakdown contributes to an increase of the suicide rate. In *Suicide* (1897) he showed that social solidarity is a predictor of suicide rates among different groups of people. The egoistic form of suicide is most commonly found in the modern societies which is a result of excessive individualism. In his classic work the *Division of Labor in Society* (1893), Durkheim shows how the society insists upon its citizens displaying all the basic resemblances because it is a condition for its own cohesion. In *The Elementary Forms of Religious Life* (1912), Durkheim suggests that the true function of religion is not communicating with god, but it is much more than that. It produces feelings of support, security, and dependence that attach the worshiper to his cult, that is, the group in which he belongs. Through worship, individuals in fact celebrate the cult. Durkheim warned about the growing sense of anomie among individuals in future society where due to lack of integration among the highly specialized elements of the institutions, the individual will find a normless situation. Durkheim suggests, as a consequence, the individual would be stressed and might even commit suicide and other anti-social acts.

The concept of “anomie” described by Durkheim, was further elaborated in Robert Merton’s (1957) strain theory. Merton observes that society places a great deal of importance on achieving material success while the opportunity to have material wealth is not equally distributed. It creates stress among the members who lack the culturally approved means to achieve the socially prescribed goal, which is to be wealthy. Individuals therefore may take deviant paths to achieve this goal. Merton’s theory suggests very clearly that the feeling of deprivation is harmful for individuals, who may feel increased stress, a sense of normlessness, and disorientation. Merton’s
theory that the feeling of being unfairly discriminated can cause “status frustration” and in the long run anti-social behavior has been supported by many criminologists as well as sociologists (Rosenfeld, 1989).

Relative deprivation in American society can best be explained by the concept of “conspicuous consumption,” a term used by Thorstein Veblen in the *Theory of Leisure Class* (1953). Veblen observed that in US society manual labor has become undignified and an indicator of lower social position. On the contrary, since owning property has become necessary to have higher status in society, individuals are increasingly engaging in ostentatious displays of their possessions. He argues that the “leisure class” in modern society is not only involved in conspicuous consumption, but also in “conspicuous waste.” According to Veblen, clothing, speech, and membership in exclusive clubs, a better-groomed lawn, and so on, are some examples of how people display their status and wealth. This leads to competition among individuals who feel strong pressure to outdo others in such displays. Relative deprivation thus becomes inevitable in modern affluent societies.

Although most Americans put themselves as “middle class,” the fact is that inequality in the distribution of household and family income is widening in the US particularly since the early 1970s (Neilson, Alderson, & Beckfield, 2005). After World War II, C. Wright Mills (1956) observes the powerlessness of ordinary people in the modern world, and how power is being concentrated in the hands of few elites, whom he called “power elites.” In his words, “The power elite is composed of men whose positions enable them to transcend the ordinary environments of ordinary men and women; they are in positions to make decisions having major consequences” (Mills,
Like Marx’s idea of a few capitalists getting bigger and bigger shares of resources, Mills notices that the economy of the present day is dominated by several hundred huge interrelated corporations, that belong to the economic, military, and political domains. The leading men in each of these three domains constitute the power elite of America. While “the top of the American system of power is much more unified and much more powerful, the bottom is much more fragmented, and in truth, impotent” (Mills, 1956, p. 29). Far fewer people (of classes other than the power elite) express opinions than receive them, and also are unable to answer back immediately or with any effect. The middle class’s realization of opinion is controlled by the power elite. They have no autonomy in the real sense.

Thus, the relatively disadvantaged groups in society may not only feel deprived because of their lower economic status but due to their relatively lower position in society. In *Outline of a Theory of Practice*, Bourdieu (1977) identified four different forms of capital that play a role in the perpetuation of social inequality. These four interconnected forms of capital are: economic capital (material possessions), social capital (social network and social support), symbolic capital (honor, power), and cultural capital (a set of social practices or skills that demonstrate individual’s membership to a group). There is a “multiplier effect” of having these four types of capital because they are not only interconnected, but also inter-convertible and inter-dependent. According to Bourdieu, in modern society the education system reproduces and legitimizes the existing social inequality. This involves a double reproduction where children from privileged classes have the opportunity to have better schooling, or more specifically to
acquire cultural capital. Individuals finish school with a fund of cultural capital that helps
their entrée into particular occupations or social circles.

Accordingly, Bourdieu’s writings suggest that beyond economic capital, there are
three other forms of non-material capital in society that play a big role in determining
individuals’ life chances. According to his theory, in modern society individuals with
lower social and cultural capital might feel relatively deprived. While Bourdieu was more
interested in analyzing social mobility and stratification, Richard Wilkinson and other
contemporary scholars focus on the health effects of relative deprivation.

Conceptual Framework

The conceptual framework of this study was Wilkinson’s hypothesis of income
inequality and health link. Wilkinson (1992) argues that after controlling for average
incomes, absolute poverty, and a number of other socioeconomic factors, mortality
tends to be lower in more egalitarian societies. In other words, life expectancy is more
likely to be correlated with income inequality than GDP per capita of a country
(Wilkinson & Pickett, 2006). Support for Wilkinson’s income inequality-health hypothesis
comes from both international (Flegg, 1982; Rodgers, 1979; Wilkinson, 1996), and
within-country studies (Blakeley, Kennedy, & Kawachi, 2001; Daly, Duncan, Kaplan, &
Lynch, 1998; Gold, Kennedy, Conell & Kawachi, 2002; Kahn, Wise, Kennedy, &
Kawachi, 2000; Kawachi, Kennedy, Lochner, & Prothrow-Smith, 1997; Kennedy,
Kawachi, Glass, & Prothrow-Smith, 1998; Kennedy, Kawachi, & Prothrow-Smith, 1996;
Shi, 1999). Wilkinson presents three sets of evidence to support his theory (Wilkinson,
1997). Firstly, mortality shows a stronger link with the income distribution within country
rather than absolute income differences between countries. Secondly, countries with lower income gaps and smaller relative deprivation have the lowest mortality rates. Thirdly, most of the long term increase in life expectancy is not correlated with economic growth. Using 1993 data from the Organization for Economic Co-operation and Development (OECD) for 23 countries, Wilkinson argues that GDP per capita is not correlated with life expectancy. In affluent nations, one’s relative social position has become a more important determinant of health than one’s absolute living standard, “socioeconomic differences in health within countries result primarily from differences in people’s position in the socioeconomic hierarchy relative to others, leaving a less powerful role to the undoubted direct effects of absolute material standards” (Wilkinson, 1997, p. 590)

There are two different sets of explanations of how inequality affects health. These are the psychosocial environment set of interpretations and the neo-materialist set of interpretations. According to psychosocial environment interpretations, income inequality affects health through psychosocial pathways. Economic inequality creates a sense of relative deprivation and stress among the people with lower status in society. Income inequality elevates stress through depriving people of nutritious food, adequate shelter, safe work environment, and a friendly neighborhood. Inequality also increases stress, depression, hostility, hopelessness, and lack of self-control (Wilkinson, 1996). If stress continues for long time, it weakens the immune system to fight against diseases. Wilkinson (2006) identifies three sources of stress as most important in modern society. First is stress associated with social status. Subordinate social position itself is a social stressor. Hence, Wilkinson expects that the effects of income inequality on health are
more likely to be stronger for the least well off in society (Gerdtham & Johanneson, 2000), and more specifically for Blacks (Harer & Steffensmeier, 1992; Shi & Starfield, 2001) and other disadvantaged racial/ethnic groups. Second, inequality is associated with lack of social relationships and trust, which is damaging for health. Third, maternal stress during pregnancy, negative experiences in babyhood and early childhood are related to poor birth weight and vulnerability to a wide variety of diseases in later life.

To support his argument of the effects of psychosocial factors, Wilkinson (2001) cites systematic reviews (for example, Hemingway & Marmot, 1999) that show that little or no control in the work place, a lack of social support, anger, depression and anxiety are related to heart disease. Studies of non-human primates such as monkeys also show that when monkeys are kept under chronic stress their level of atherosclerosis increases which in turn increases a tendency to obesity and increased basal cortisol values (Wilkinson, 2001). Wilkinson argues that the effects of psychosocial factors are not confined only to the biological effects such as weakened immune system, rather that these effects contribute to behavioral risk factors, too. People who feel relatively deprived are therefore vulnerable to behavioral risk factors such as smoking, excessive drinking, no exercise, and drug abuse (Wilkinson, 2006).

According to the psychosocial perspective, inequality also affects health through disturbing the level of trust in society. The inequality effect on health that is mediated through stress is almost the same as the effect that is mediated through levels of trust and participation in community life (Wilkinson, 2006). Wilkinson (2006) claims that poorer social relations are one of the major risk factors for health in affluent countries. Inequality worsens both social relations and health. Based on this argument, some
researchers have included the level of social cohesion or social trust in their analysis of inequality and health. It has been found that greater income inequality decreases social cohesion and increases social divisions, and thereby negatively affects health (Kawachi et al., 1997; Neil & Davey, 2003).

Proponents of the neo-materialist perspective of the inequality-health link, on the contrary, complain that variables like trust, respect, and support and informal social relations seem hard to apply to understand the public policy agenda (Kaplan et al., 1996; Kawachi et al., 1997; Lynch et al., 2000, 2004; Mellor & Milyo, 2001). They claim that the differential distribution of resources and capital across the life course makes people at lower strata vulnerable to health risks. Neo-materialists argue that the effects of income inequality may be significant only for those who are at the lowest stratum of society (Soobader & LeClere, 1999). Greater inequality in society means greater concentration of resources in the high-income areas (Kaplan et al., 1996; Davey Smith, 1996).

Kaplan et al (1996) indicated a “potential pathway”—the neomaterialist link—between income inequality and health where income inequality is associated with factors like unemployment and work disability, lower insurance coverage, educational achievement, social welfare and medical expenditures. According to Lynch et al (2000) neo-material pathways of income inequality effects on health at the person level are determined by the income of the person, while at the population level they are determined by the nature of the community infrastructure which is largely influenced by neo-liberal living conditions.
As briefly mentioned in Chapter 1, the neo-materialist perspective is rejected by Wilkinson and others supporters of the psychosocial explanation. According to Wilkinson, neo-materialist explanations emphasize material conditions, and thereby ignore the main mechanism of the inequality and health link. Inequality affects health directly by weakening the immune system. Inequality also affects health by making people vulnerable to a wide range of risk factors such as smoking, drinking, lack of exercise, and drug abuse. Thus, the major weakness of the neo-materialist perspective is that by focusing on material conditions and unequal distribution of resources, this perspective contradicts the central theme of Wilkinson’s income inequality hypothesis, which clearly states that regardless of the material conditions in affluent nations, relative inequality plays a role in determining people’s health. The focus of the current study, therefore, is to examine the psychosocial perspective of income inequality effects on health, specifically its effects on infant mortality.

Review of Existing Research on Infant Mortality

Infant mortality is perhaps one of the most researched topics in medical sociology. Scholars’ focus and interest on infant mortality as a social problem dates back long before medical sociology as a field of study was institutionalized. Indeed, as early as between 1842 and 1844, Engels studied working-class people in Manchester, England and hypothesized that infant mortality in working-class districts were explainable partly by lack of medical care. His analysis indicates that class, urbanism, and lack of medical care exert a cumulative effect on childhood mortality (Engels, 1844; Waitzkin, 1983). Since then, throughout the twentieth century, demographic and SES
factors were the dominant variables in infant mortality research. For example, while the immediate causes of very low birth weights are clinical in nature, SES and demographic factors are still found to be correlated with preterm birth in the most recent research. Mother’s age has also been found to be an important predictor of birth outcomes (Chen et al., 2003; Guendelman, Thornton, Gould, & Hosang, 2006; Lu et al., 2001; Mayer et al., 2005; Papacek, Collins, Schulte, Georgen, & Drolet, 2002; Salihu et al., 2003; Salihu, Garces, Sharma, Kristensen, Ananth, & Kirby, 2005). Other predictors are marital status of the mother (Jain, Khoshnood, Lee, & Concato, 2001; Papacek et al., 2002; Phipps, Sowers, & Demoner, 2002), level of parental education (Jain et al., 2001; Gould et al., 2003; Hauck et al., 2002; Rebecca & Irva, 1998; Salihu et al., 2003), unemployment rate (Darity & William, 1993), household incomes below the poverty level (Stockwell et al., 1995), insurance status (Bloom, Simpson, Cohen, & Parsons, 1997), place of residence (Baldwin, Grossman, Casey, Hollow, Sugarman, Freeman, & Hart, 2002; Collins & David, 1992), and so on.

Research on income inequality and health is relatively new in medical sociology literature. Perhaps one of the earliest and most influential studies of income inequality and health was Rodger’s (1979) cross-national study of 56 countries, where he concluded that greater inequality is associated with higher mortality. His theory argues that in developed countries the relationship between income and life expectancy is asymptotic, “there is a maximum life expectancy beyond which increases of income have no further effect” (p. 533). Mean life expectancy, therefore, is a function of not only of the mean income level, but also of the income distribution. He found that the
difference between life expectancy at birth between the relatively egalitarian and inegalitarian country is likely to be 5-10 years.

Research focused on the effects of inequality on health has proliferated in the last couple of decades. For instance, Wilkinson and Pickett (2006) reviewed 198 country-level, state-level, and county-level studies and found that 87 of them wholly supported the link between inequality and health, 44 partially supported the link, and the rest of the 37 studies did not support the link. Their review shows that studies on larger areas are more likely to have supportive findings because the effects of stratification might be more pronounced. However, Lynch and colleagues (Lynch, Smith, Harper, Hillemeir, Ross, & Kaplan, 2004) reviewed 98 articles and did not find much support for the income inequality-health link, and indicated that among 25 multilevel studies (that included individual, community, and state level variables) in the US, only 17 supported the link.

A number of both cross-national and within-country studies have also found that income inequality affects IMRs. Among the international studies Flegg (1982) based on his study of 46 underdeveloped countries, suggested that the redistribution of income in these countries would have substantial impact on IMRs. While Flegg’s focus was underdeveloped nations, Pampel and Pillai (1986) focused on 18 developed nations for 1950-1975. They found that income inequality had a small but significant effect on the neonatal mortality (the death of a live-born baby within 28 days of delivery) rate, but little effect on the postneonatal mortality (the death of an infant aged 28-364 days of age) rate. Shi, Starfield & Kawachi (1999), and Mayer & Sarin (2005) report similar findings from their analyses regarding differential effects of income equality on neonatal versus
postneonatal mortality rates. Additional support for the argument that reducing income inequality could have a significant impact on infant mortality was found from the study conducted by Hales, Howden-Chapman, Salmond, Woodward, and Mackenbach (1999). They analyzed income distribution data from 23 poor countries (GNP per head < US$1000) and 15 richer countries (GNP per head >1000). They concluded that though IMRs of both developed and developing countries could be affected by reducing income inequality, the effects are likely to be greater for rich countries than for the poorer ones. Consistent with the findings of these studies, Macinko, Shi, and Starfield (2004) found that wage inequality (based on industrial sector wages) was a significant determinant of infant mortality in their international study of 19 developed countries. Indeed, many other recent cross-national studies have either completely or partially supported the greater-inequality-higher-IMR link (e.g., Kennedy, Bruce, Kawachi, & Prothrow-Smith, 1996; Shi, Macinko, Starfield, Xu, Regan, Poitzer, & Wulu, 2004; Sohler & Arno, 2003).

Mellor and Milyo’s (2001) findings on 48 US states are, however, inconsistent with the results found in studies mentioned above. That is, they did not find any strong and consistent relationship between inequality and health or inequality and infant mortality (r=0.043, p = 0.688). They claim that in some studies the relationship is present because inequality itself is a consequence of other social and economic factors that determine both inequality and health. While in their analysis, income inequality and infant mortality are significantly and positively related, when they added income per capita and secondary school enrollment the effect of income inequality on infant mortality was no longer significant. Like Mellor and Milyo (2001), Moyer and Sarin (2005) found that adding or removing a control may lead to a change of the effects on
inequality on infant mortality. Specifically, their analyses showed that with no controls neonatal (but not postneonatal) infant mortality tends to be higher in high-income-inequality US states than in less-income-inequality US states. However, when they controlled for states’ mean income, percent Black, percent Hispanic, age distribution, and census division, the estimated effect on probability of death remained significant but declined. When they added mother’s age and race, the effect was reduced further and remained marginally significant. When economic segregation was added, the estimated effect was reduced to close to zero. Adding state spending on medical care to the model increased the effects of inequality significantly. Of note, while Mayer and Sarin indicated that they initially estimated models separately by race, they did not report these results because they did not find any significant income inequality difference by race. However, the measure they used for income inequality was not race-specific.

The remaining sections of the literature review are organized by three questions. These are: (1) does the relationship of income inequality and infant mortality vary by race/ethnicity? (2) does intra-race/ethnicity income inequality explain race/ethnicity-specific infant mortality? And (3) which factors mediate the effects of income inequality on infant mortality?

*Does the relationship of income inequality and infant mortality vary by race/ethnicity?*

The mechanism of income inequality effects on health as identified by most researchers, including Wilkinson & Pickett (2006), Wilkinson (2005), Marmot & Wilkinson (1999), Berkman & Kawachi (2000), and Johannes & Marmot (2004) is relative low status and its associated psychosocial factors such as stress and health
related behavior. Wilkinson (2006) argues, “The effects of social status on health are likely to be exacerbated by the greater insecurities facing those who lose out in the competition for status” (p. 712). Based on this line of argument, since Black and Hispanic Americans are more likely to be disadvantaged by SES indicators and disproportionately more likely to live in poor and marginal neighborhoods, it would be reasonable to assume that the effects of income inequality would be more strongly experienced by them compared to their non-Hispanic White counterparts (LeClere & Soobader, 2000; Lopez, 2004). According to the psychosocial explanation, racism can interact with inequality by inducing life stressors (Wilkinson, 1980). Being a member of the lower level in the stratification system increases feelings of structural powerlessness, alienation, and lack of control, which may affect health in the long run (Thoits, 1995).

The fact that psychophysiological stress related to discrimination and social isolation might affect low birth-weight has been documented in prior studies (Zambrana, Scrimshaw, Collins, & Dunkel-Shetter, 1997). Black women who feel that they have been discriminated against during pregnancy are at greater risk of having low birth weight babies (Collins, David, Hnadler, Wall, & Andes, 2004). An Institute of Medicine committee examined a range of factors which they called “beyond access-related factors” that may be involved in racial and ethnicity healthcare discrimination. The committee recognized that the access level factors or the “threshold” factors (i.e., income, health insurance status, and geography) are likely the most significant barriers to equitable care. After controlling for these factors, however, the committee recognized that bias, discrimination, and stereotyping at the individual, institutional, and health
systems levels may explain some part of racial/ethnic disparities in health (e.g., Mustillo, Kreiger, Gunderson, Sidney, McCreath, & Kiefe, 2004; Sedlis, Fisher, Tice, Esposito, Madmon, & Steinberg, 1997; Van Ryn & Burke, 2000).

It is somewhat surprising, then, that most studies do not show that income inequality has stronger effects on health for Blacks compared to Whites. For example, in Kennedy et al.’s (1996) study, the association between total population income inequality and mortality for both Blacks and Whites was similar. Shi et al. (1999) controlled for minority population in their model but did not investigate any race-specific effects of income inequality. McLeod et al. (2004) also did not find racial composition to be a significant predictor of infant mortality, and consistent with this did not find any significant effect of Black income inequality on Black infant mortality. Shi, Macinko, Starfield, Politzer, Wulu, and Xu (2005) found that the percentage of state’s Black population was positively associated with infant mortality, however, they did not control for the Hispanic population. They examined to what extent primary care physician availability moderated the association between income inequality and infant mortality in US states. The results of their analysis indicated that income inequality was positively associated with low birth-weight and infant mortality, but that the relationships disappeared with the addition of SES factors. In an earlier study Shi and Startfield (2001) also examined race-specific mortality, but their measurement of income inequality was not race-specific. They found that physician supply was only weakly associated with Black mortality in low-income inequality metropolitan areas.

In addition, there are conflicting findings that show that income inequality has stronger effects on health outcomes for Whites. For example, in a recent study,
Subramanian and Kawachi (2006) found that the relationship between the level of income inequality in a state’s total population and health is stronger for Whites than for Blacks. Lochner, and Kawachi (2001) report similar results, that is, the effect of state-level (or total population) income inequality was significant only for near-poor Whites.

Further complicating any conclusions regarding racial differences regarding the income inequality effect on health, the effect has tended to change when researchers add or remove controls for racial composition (Lynch, Harper, Kaplan, and Smith, 2005). For example, Deaton and Lubotski (2003) show that once they controlled for the share of the population that was Black, there was no relationship between income inequality and overall mortality across US states or cities. They explain: “Blacks have higher mortality rates than Whites and, on average, have lower incomes, so that in places with a substantial Black population, both income inequality and mortality tend to be higher” (p.1142). While they used a race-specific measure of income inequality, they found no effect: “Without race, inequality appears to be a mortality risk. With conditioning on race, inequality is insignificant or attracts a negative sign” (p.1139).

Moreover, if income inequality is expected to contribute to Black infant mortality, then it should also be expected to contribute to Hispanic infant mortality. Hispanics should also have similar birth outcomes as Blacks. On the contrary, though, despite sharing their lower socioeconomic status relative to Whites with Blacks, Hispanics have tended to have better health, including better birth outcomes, the latter of which has been termed by some as the “Latina Paradox” (Frisbie & Song, 2003). It has also been suggested by some that the relatively favorable health outcomes of Hispanics are due to their better health behavior compared to non-Hispanic Whites and Blacks. For
instance, compared with non-Hispanic mothers, Hispanic mothers have been found to be much less likely to have smoked before or during pregnancy (Ventura, Hamilton, Mathews, & Anjani, 2003). A number of “cultural protective factors” are believed to provide a healthier normative and behavioral context for Hispanic pregnant women. These include support for maternity, healthy diet, abstinence from alcohol and smoking and, also, supportive informal systems of prenatal care via co-ethnic ties (McGlade, Saha, & Dahlstrom, 2004). However, these “cultural protective factors” or, for that matter, degree of assimilation, acculturation or Americanization suggested by some researchers (Cervantes, Keith, & Wyshak, 1999; Fuentes-Afflick; Hessol, & Pérez-Stable, 1999; Markides & Coreil, 1986) might not fully explain the Black-Hispanic difference in birth outcomes (Franzini, Ribble, & Spears, 2001; Dressler, Oths, & Gravlee, 2005).

A few studies have shown that the effects of income inequality on health differ when a large proportion of the population is Hispanic. For example, Franzini, Ribble and Spears (2001) conducted a county level analysis in Texas to determine if the effects on income inequality on health vary by population size. They found support for the income inequality-health hypothesis only for counties with a population over 150,000, which are metropolitan counties. Moreover, when they added percent Hispanic as an interaction term with income inequality and other control variables, the income inequality-health relationship was significantly changed. Though their result supports the Hispanic paradox, Franzini et al. (2001) do not believe that misreporting of Hispanic ethnicity or return migration could explain these differences in mortality. However, they suggested that besides cultural practices, there might be characteristics of the community that
could explain this difference of income inequality effects on mortality. It is not very clear what they meant by “characteristics of the community.”

The general lack of support in the literature for stronger effects of income inequality on health outcomes for Blacks and Hispanics is likely due to two limitations of these studies. First, few have examined race/ethnicity-specific health outcomes. Instead, the majority of studies examined health outcomes of the total population, controlling for percent Black in the population. According to this current study, race/ethnicity-specific health outcomes, or more precisely race/ethnicity-specific infant mortality as a dependent variable will better capture any health effects of income inequality. Second, if for non-Hispanic Blacks and Hispanics, the reference group is their own group, then controlling for percent Black and percent Hispanic and using a total population inequality index are probably not the best measures to use to test the expected differential effects of income inequality by race/ethnicity.

*Does intra-race/ethnicity income inequality explain race/ethnicity-specific infant mortality?*

The higher IMRs for Blacks and the persistent gaps in IMR among Whites, Blacks and Hispanics are not explained by the existing literature satisfactorily. Reasons for this include the researchers’ tendency to focus on overall health outcomes as well as their tendency to use a total population inequality index. Almost all of the US studies have used a measure of inequality within a geographic area’s total population. An underlying assumption of their use of such a measure is if inequality affects health then it affects all racial/ethnic groups similarly. In other words, all Whites, Blacks, and
Hispanics who are at the bottom of society may use “the rich” as their reference group and feel relatively deprived. However, this assumption is probably not correct. Mellor and Milyo (2002) raise this question, “it is not clear why state-level inequality is an appropriate independent variable, as opposed to inequality … within race … .” (p. 515).

Increasingly, especially in the criminology literature, researchers have begun to use measures of within-race or intra-racial inequality in a given geographic area to represent the extent of relative deprivation and its effect on crime or violence in the area. Blau and Blau (1982) suggested a relative deprivation theory in which inequality associated with ascribed position, such as race/ethnicity, is a predictor of violent crime. To Blau and Blau (1982) it is relative deprivation produced by within-race inequality that is “the most fertile soil for criminal violence” (p.119). Using 1970s crime statistics on the 125 largest metropolitan areas in the US, they found that, as their theory predicts, intra-racial economic inequality had a direct, positive and significant effect on murder and assault. Moreover, they also found that when the effects of inequality were controlled for, the relationship between level of poverty and criminal violence disappeared.

Based on Blau and Blau's (1982) relative deprivation theory, Harer and Stefensmeier (1992) used three measures of income inequality in their analysis of its effects on violence rates by race. One of these measures was a measure of intra-race inequality. According to Harer and Stefensmeier (1992), this is the most appropriate measure as it best represents relative deprivation theory. Citing other criminology studies, they argued that most Blacks live in segregated communities. Therefore, they do not use the total population or even “Whites” as their reference group, rather most of them use other Blacks or their “significant others” as their reference group. Likewise, it
is reasonable to expect that Hispanics as well are likely to use other Hispanics as their reference group.

The importance of examining the effects of race/ethnicity-specific inequality has also been emphasized recently in some medical sociology studies. For instance, similar to the criminologists describe above, McLeod, Nonnemaker and Call (2004) argued that race/ethnicity-specific income inequality is a better measure than total-population income inequality because racial/ethnic group members are more likely to see co-ethnics as their reference group than the population as a whole. Moreover, within-race income inequality tends to vary across different races. For example, Cooper, Kennelly and Durazo-Arvizu (2001) found that the within-race income inequality is higher among Blacks (0.45) than among Whites (0.40; p<0.001). McLeod, Nonnemaker, and Call (2004) calculated two measures of intra-racial household income inequality (i.e., one for Blacks and one for Whites) in addition to one for overall household income. In contrast to predictions of the relative income inequality hypothesis, they found that states with a high level of income inequality within their total population tended to have lower Black infant mortality, which according to the researchers was probably due to some outliers (i.e., a few states, Kentucky, Massachusetts, and Texas had relatively high levels of total income inequality and low Black IMRs). On the other hand, while they found that Black-specific income inequality had a significant effect on Black teen birth rates, they did not find any significant effect of Black income inequality on Black infant mortality. They attributed this lack of effect to the controls they used, which included median family income and proportion Black and proportion Hispanic in the state.
While some prior research has recognized the intra-race inequality effect on race-specific health outcomes, controversies remain between the supporters of psychosocial and neo-material perspective regarding how this effect is mediated. Only a few studies have examined the mechanisms that link health outcomes to levels of inequality.

*Which factors mediate the relationship between income inequality and infant mortality?*

The explanation of how income inequality affects health differs among researchers based on whether their perspective is neomaterial or psychosocial. The neomaterialists believe that the effect is mediated through unequal access and distribution of resources, whereas the psychosocial environment supporters believe that higher inequality is associated with poor health outcomes through a weak psychosocial environment. This weakness is characterized by a low level of social capital—that is, reduced social trust and increased vulnerability to behavioral risk factors, as well as little participation of members in the community—and has been operationalized by researchers in a number of different ways. For instance, for comparing the quality of the psychosocial environment of wealthy nations, Lynch, Smith, Hillemeier, Shaw, Raghunath, and Kaplan (2001) used measures of distrust, belonging to organizations, volunteering, perceived control, belonging to trade unions, and females in government. Among the published literature on social capital and the inequality-health link, the state-level study conducted by Kawachi, Kennedy, Lochner and Prothrow-Smith (1997) in the US was one of the first to examine social capital as a mediator. They measured social capital by civic participation and trust in others. Essentially consistent with the
inequality-psychosocial-health hypothesis, they found that high levels of perceived fairness were related to higher age-adjusted total mortality. Their analysis also indicated significant Black-White differences in this relationship. While a 10% rise in perceived fairness resulted in a decline of 36.5 deaths per 100,000 population for Whites, for Blacks the decline was only 23.9 deaths per 100,000 population. Based on the path analysis coefficients, they argued that the main effect of income inequality on mortality is through social capital as measured by level of perceived fairness. In their analysis, they also found a strong negative relationship between income inequality and per capita group membership (i.e., membership in volunteer groups or organizations). Although the findings of Kawachi et al.’s study provide support for level of social capital in a geographic area as a mediator in the inequality-health relationship for the area’s total and various cause-specific mortality rates, it is not clear whether this holds for race/ethnicity-specific mortality rates. Also, the indicator of social capital that the researchers used was not race/ethnicity-specific. In this dissertation, a race/ethnicity-specific measure was used, based on the assumption that social capital is likely to differ by race/ethnicity.

Neomaterialists, on the contrary, have argued that income inequality-health relationship is mediated through social policies (Kaplan et al., 1996; Melloe & Milyo, 2001; Wagstaff & van Doorslaer, 2000). They believe that income inequality affects public policies and that in turn public policies affect health. Neo-materialists argue that income inequality affects health by factors that are outside of or precursors to psychosocial mechanism (Mullahy et al., 2004). As greater inequality means concentration of investment in high income areas, individuals living in the low-income
areas will have lower access to health care compared to those living in the high-income areas (Davey-Smith, 1996; Lynch et al., 1998). According to them, since inequality is the result of the existing structural, political, and social processes, focusing on these factors would be more appropriate to understand the link rather than focusing on the individuals’ perception of inequality (Lynch et al., 2000).

Marmott and Wilkinson refute the neo-materialist perspective on the grounds that the neo-materialist explanation “seems to embrace everything but the genome” (2001, 2001, p. 1234). They (2001) suggest that even if material living conditions change, “the psychosocial effects of relative deprivation involving control over life, insecurity, anxiety, social isolation, socially hazardous environments, bullying, and depression remain untouched. Evidence shows that these factors influence health and that their prevalence is affected by the socioeconomic structure and by people’s position within this” (p. 1334). According to Wilkinson (2001), the poorer health outcomes for Blacks in the US are more related to the relative deprivation through psychosocial factors than due to the direct effects of material conditions themselves.

Summary of the Literature Review

The above review of literature suggests that researchers are increasingly incorporating income distribution in their explanations and analyses of health outcomes at the aggregate level. That income inequality among the population is an important predictor of health and especially infant mortality is well supported by a number of studies. However, it is not clearly known yet how the effects of income inequality on infant mortality vary by race. Some research shows that Black women are susceptible to higher level of stress and stress is associated with poor birth outcomes. But it is also not
clear why Hispanics tend to have favorable birth outcomes compared to Blacks even though the two racial/ethnic groups are both likely to feel economically deprived. In addition, most of the studies on health and income inequality have ignored the fact that people may not compare their condition with everyone else in the society; rather they may compare themselves against members of their own group.

Although research on income inequality and health is growing, the literature that explains racial/ethnic disparities in health, and more specifically infant deaths is much more limited. Moreover, the existing literature is biased towards using the level of income inequality in the total area population as the indicator of income inequality, whereas intra-racial/ethnic inequality in the area might better explain the health outcome. Although McLeod et al. (2004) used an intra-racial inequality measure and examined race-specific infant mortality rates, the major differences of this dissertation with their study are:

1. McLeod et al., (2004) only examined Black and White IMRs. Considering the increasing proportion of Hispanics in many states, this current study includes Hispanic IMRs in an effort to better understand why Blacks have twice as high IMRs compared not only to non-Hispanic Whites, but also to Hispanics.

2. Though the income inequality-health link is supported in the McLeod et al. study, the mechanism through which the relationship is mediated is not clear. Focusing on the psychosocial perspective on inequality and health link, this dissertation explored the roles of both mothers’ behavioral risk factors within the racial/ethnic group and level of social mistrust within the racial/ethnic group as mediators in the income inequality-IMR relationship for the racial/ethnic group.
Based on these limitations of the existing literature, this dissertation examined intra-racial/ethnic income inequality to better understand the factors that contribute to racial/ethnic-specific IMRs for non-Hispanic Whites, non-Hispanic Blacks, and Hispanics. The conceptual model for the study is derived from Wilkinson’s psychosocial environment interpretation of the income-inequality-health hypothesis (1992, 1995, 1996, 1997, 1999, 2006). This hypothesis is consistent with most sociological theories of stratification. Although it has been supported by many health services researchers in cross-national, national, and state-level studies, there are still some issues with conceptualizing the inequality measure. In a racially and ethnic diverse society like the US, a “global” measure of inequality, the level of inequality in the total population of a geographic area, may not adequately capture race/ethnicity-specific relative deprivation. As members of racial/ethnic groups are more likely to live in residentially segregated areas (Iceland, Weinberg, & Steinmetz, 2002), their comparison group is more likely to be members of their own group rather than the population as a whole. Accordingly, this study draws from the criminology field where intra-group (i.e., intra-racial/ethnic) inequality has been considered as predictor of differential crime rates by Whites and Blacks (Blau & Golden, 1986; Harer & Stefensmeier, 1992; Stolzenberg, Eitle and Alessio, 2006;). Thus, in this dissertation’s investigation of the relatively higher IMRs of Blacks in the US, it was hypothesized that all else equal, race/ethnicity-specific IMRs are positively affected by intra-racial/ethnic income inequality. Based on the psychosocial explanation, this dissertation also hypothesized that the levels of social mistrust and risky behavior within the racial/ethnic group mediate the income-inequality-IMR relationship in the group. Specifically, three hypotheses were tested in this study:
H₁: All else equal, the racial/ethnic-specific IMR will tend to be higher in areas where the level of inequality within the racial/ethnic group is higher.

H₂: All else equal, the effect of income inequality on infant mortality within a given racial/ethnic group is mediated by the level of social mistrust in that racial/ethnic group.

H₃: All else equal, the effect of income inequality on infant mortality within a given racial/ethnic group is mediated by the risk profile of the mothers in that racial/ethnic group.

The next chapter provides a description of the data sources and the statistical procedures that were used to test these hypotheses.
CHAPTER III
DATA AND METHOD

Data Sources

This study includes infants that were born or died in the year 2000 in all 50 states of US except the District of Columbia, Puerto Rico, and the Island areas. Data were obtained from three sources: the Linked Birth and Infant Death (LBID) dataset, 2000 (CDC, 2007), US Census, 2000 (US Census Bureau, 2007), and the General Social Surveys 1972-2002 Cumulative File (Davis, Smith, & Marsden, 2003). In Table 1, the data sources of the variables in this study are listed.

The LBID dataset.

Data on infant birth, death, prenatal care, race, ethnicity, maternal smoking and drinking were obtained from the 2000 LBID dataset. These data were used to calculate state-level IMRs and state-level measures of behavioral characteristics of the mother. The LBID database is created and maintained by the NCHS. The dataset links information from the death certificate for each infant under one year of age to the information provided in the birth certificate. Information that is included from the birth certificates includes race and Hispanic origin of the mother, prenatal care usage, maternal smoking, and maternal drinking, among other factors. This information is linked to information from the death certificate of infants. The LBID database is released annually. The numerator file of the dataset contains linked birth and death records of a particular cohort. The denominator file contains all live births occurring in the US in that
year. Approximately 98% of infant deaths are matched to birth records in this dataset (National Center for Health Statistics, 2005). The rates calculated from the LBID might differ from those calculated from the NCHS vital statistics mortality file for three reasons: (1) geographic differences, (2) additional quality control, and (3) weighting.

Table 1

**Variables’ Sources and Description**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant Mortality Rates</td>
<td>LBID</td>
<td>Infants who died in the year 2000 per 1000 live births</td>
</tr>
<tr>
<td><strong>Independent Variable</strong></td>
<td></td>
<td></td>
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<tr>
<td>Intra-racial/ethnic income</td>
<td>US census</td>
<td>Constructed from race/ethnicity-specific household income distribution</td>
</tr>
<tr>
<td>inequality</td>
<td></td>
<td></td>
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<tr>
<td><strong>Controls</strong></td>
<td></td>
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</tr>
<tr>
<td>Per capita income</td>
<td>US census</td>
<td>Per capita income at the state level</td>
</tr>
<tr>
<td>Percent Black</td>
<td>US census</td>
<td>Percent of state population that is black</td>
</tr>
<tr>
<td>Percent Hispanic</td>
<td>US census</td>
<td>Percent of state population that is Hispanic</td>
</tr>
<tr>
<td><strong>Mediators</strong></td>
<td></td>
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<tr>
<td>Risk Profile</td>
<td>LBID</td>
<td>Percent of mothers who had late (starting at 7th month) or no prenatal care, smoked, and/or consumed alcohol during pregnancy.</td>
</tr>
<tr>
<td>Social Mistrust</td>
<td>GSS</td>
<td>Percentage of respondents who agreed with the statement “you can’t be too careful in dealing with people.”</td>
</tr>
</tbody>
</table>
The US census.

State-level per capita income, racial composition, and the race/ethnicity-specific household income distribution were obtained from the 2000 US census (US Census Bureau, 2007). In 2000 the Census Bureau collected information from about 115.9 million housing units and 281.4 million people in the US. For this current study Summary File 4 (SF4) was used. Sample data on all people and housing units are available through SF4. Data for each state is released as an individual file. This sample data contains 213 tables.

The General Social Survey (GSS).

Data on race/ethnicity-specific social cohesion or level of social mistrust were obtained from the 2000 GSS (Davis, Smith, & Marsden, 2003). Funded by the National Science Foundation the GSS collects data on attitude, behavior and attributes of contemporary American society. The majority of GSS data are collected through face-to-face interviews of the non-institutionalized English-speaking persons 18 years of age or older living in the United States. In the year 2000 (the year used in this study) a full probability sampling was employed and a total of 2817 completed interviews were conducted.

The Sample

This study examined income inequality effects on infant mortality at the state level. So, the study population includes all the 50 states of the United States. However, consistent with the reporting of the NCHS (2006), eight states have been excluded from
the sample. The IMRs of these states were based on too low number of infant deaths and therefore too low for meaningful analysis. These states are North Dakota, South Dakota, Vermont, Montana, Maine, Idaho, Wyoming, and West Virginia. For example, in the LBID file, there was no Black infant death in Idaho, Maine, Montana, South Dakota, Vermont, and Wyoming in the year 2000. Also in North Dakota, there was only one Black infant death and four Hispanic infant deaths in the year 2000. In West Virginia there was no Hispanic infant death that year. Because of these low numbers, the NCHS (2006) in their report also did not report these states. According to NCHS, estimates for these states are unreliable because the number of infant deaths is lower than 20. Therefore, finally 42 states have been included in the sample. For reference, the racial/ethnic composition and number of infant deaths for the eight excluded states is presented in Table 2.

Table 2

*Racial Composition of the Population and the Race Specific Number of Infant Deaths in the Eight Excluded States (Data from US Census and LBID)*

<table>
<thead>
<tr>
<th>State</th>
<th>Population (%)</th>
<th>Number of Infant deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Black</td>
</tr>
<tr>
<td>Idaho</td>
<td>87.98</td>
<td>0.37</td>
</tr>
<tr>
<td>North Dakota</td>
<td>91.85</td>
<td>0.56</td>
</tr>
<tr>
<td>South Dakota</td>
<td>88.07</td>
<td>0.59</td>
</tr>
<tr>
<td>Vermont</td>
<td>96.12</td>
<td>0.47</td>
</tr>
<tr>
<td>Montana</td>
<td>89.51</td>
<td>0.24</td>
</tr>
<tr>
<td>Main</td>
<td>96.53</td>
<td>0.45</td>
</tr>
<tr>
<td>Wyoming</td>
<td>88.81</td>
<td>0.61</td>
</tr>
<tr>
<td>West Virginia</td>
<td>94.52</td>
<td>3.08</td>
</tr>
</tbody>
</table>

*Data Sources:* ¹US Census; ²LBID
Variables

The dependent variables for this study were race/ethnicity-specific IMRs in the year 2000. Therefore, there were three dependent variables in this study: the non-Hispanic White IMR, non-Hispanic Black IMR, and Hispanic IMR. The three focal independent variables were also race/ethnicity specific. Non-Hispanic White intra-racial income inequality was used as the predictor of non-Hispanic White IMRs. Non-Hispanic Black intra-racial income inequality was used as the predictor of non-Hispanic Black IMRs. And, Hispanic intra-ethnicity income inequality was used as the predictor of Hispanic IMRs. The two “mediating” variables were race/ethnicity-specific level of social mistrust and race/ethnicity-specific risk profile of mothers in the state. And, finally, control variables included per capita income and racial composition for the state.

*The infant mortality rates.*

Dependent variables for this study were three race/ethnicity-specific IMRs at the state level, specifically, the IMRs for non-Hispanic Whites, non-Hispanic Blacks, and Hispanics. Infant mortality is defined as the number of infant deaths between ages 0 to 12 months by all causes of death in a particular year. For this study, IMRs were calculated based on the infants who died in the year 2000 and the total live births in the same year, specifically:

\[
\text{IMR} = \frac{\text{Number of infant deaths}}{\text{Total live births}} \times 1,000
\]
The average IMR for the total population in the 42 states was 6.51 per 1,000 live births (Table 3). The average IMR for non-Hispanic Blacks (13.20 per 1,000 live births) is more than two times as high as the average for non-Hispanic Whites (5.79 per 1,000 live births) and also significantly higher than the average for Hispanics (6.15 per 1,000 live births). Black IMRs also vary widely across the states (standard deviation=2.81) with a maximum of 19 per 1000 live births (in New Mexico). Non-Hispanic White IMRs do not vary as much across states (SD =0.91) with a range of 3.76-7.57 deaths per 1000 live births.

Income inequality or Gini.

Income inequality was the major independent variable or predictor in this dissertation study. There are many different ways of calculating income inequality for a population: the ratio of income share, the Robin Hood Index, the Atkinson Deprivation Index, and the Gini Coefficient. In this study the Gini coefficient was used as the measure of income inequality. The Gini coefficient represents a comparison of cumulative income shares to cumulative population shares for members of a single population (Fossett & Seibert, 1997). The Gini coefficient is based on the Lorenz curve, where the distribution of a specific variable is compared to the uniform distribution that represents equality. The Gini ranges from 0 to 1.0, or absolute equality to absolute inequality.

At the state level, three sets of race/ethnicity-specific income inequality indices or Gini coefficients were calculated: these were, one for the non-Hispanic Black population in the state based on the distribution of household income among non-Hispanic Blacks in the state; one for non-Hispanic Whites based on the distribution of
household income among non-Hispanic Whites in the state; and, one for Hispanics based on the distribution of household income among Hispanics in the state. As mentioned earlier, race/ethnicity specific measures of income inequality were used because it is reasonable to expect that rather than feeling deprived relative to total population in a geographic area one may feel deprived relative to members of their own racial/ethnic group in that area.

As Table 4 shows the average level of intra-racial/ethnicity income inequality is highest among non-Hispanic Blacks (Gini =0.4601) compared to the other two racial/ethnic groups (white Gini = 0.4373, and Hispanic Gini = 0.4362). For the Blacks, the level of intra-racial income inequality also varies most across states (SD = 3.02; range=35.14 to 49.79). Variation in the level of intra-ethnicity income inequality across states is lowest for Hispanics (SD = 2.88; range=39.83 to 49.44).

Table 3

Descriptive Statistics for the Dependent Variables

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std dev.</th>
<th>Min.</th>
<th>Max.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMR</td>
<td>6.51</td>
<td>1.67</td>
<td>2.45</td>
<td>10.48</td>
<td>42</td>
</tr>
<tr>
<td>White IMR</td>
<td>5.79</td>
<td>0.91</td>
<td>3.76</td>
<td>7.57</td>
<td>42</td>
</tr>
<tr>
<td>Black IMR</td>
<td>13.20</td>
<td>2.81</td>
<td>2.61</td>
<td>18.87</td>
<td>42</td>
</tr>
<tr>
<td>Hispanic IMR</td>
<td>6.15</td>
<td>1.73</td>
<td>2.68</td>
<td>11.74</td>
<td>42</td>
</tr>
</tbody>
</table>

*Note:* The values for the mean, minimum and maximum are for infant deaths per 1000 live births.
Table 4

Descriptive Statistics for the Independent Variables and Controls

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std dev.</th>
<th>Min.</th>
<th>Max.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gini for total population</td>
<td>44.55</td>
<td>2.25</td>
<td>39.81</td>
<td>49.22</td>
<td>42</td>
</tr>
<tr>
<td>White Gini</td>
<td>43.73</td>
<td>2.02</td>
<td>38.45</td>
<td>47.88</td>
<td>42</td>
</tr>
<tr>
<td>Black Gini</td>
<td>46.01</td>
<td>3.02</td>
<td>35.14</td>
<td>49.79</td>
<td>42</td>
</tr>
<tr>
<td>Hispanic Gini</td>
<td>43.62</td>
<td>2.88</td>
<td>39.83</td>
<td>49.44</td>
<td>42</td>
</tr>
<tr>
<td>Per capita income (US$)</td>
<td>21244.69</td>
<td>2813.54</td>
<td>15853</td>
<td>28766</td>
<td>42</td>
</tr>
<tr>
<td>Racial composition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>72.77%</td>
<td>14.33</td>
<td>22.80%</td>
<td>95.09%</td>
<td>42</td>
</tr>
<tr>
<td>Black</td>
<td>11.36%</td>
<td>9.48</td>
<td>0.66%</td>
<td>11.36%</td>
<td>42</td>
</tr>
<tr>
<td>Hispanic</td>
<td>8.73%</td>
<td>9.36</td>
<td>1.33%</td>
<td>42.09%</td>
<td>42</td>
</tr>
<tr>
<td>Mistrust</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>36.28%</td>
<td>5.50</td>
<td>28.86%</td>
<td>48.97%</td>
<td>37</td>
</tr>
<tr>
<td>Black</td>
<td>47.52%</td>
<td>5.37</td>
<td>37.50%</td>
<td>54.35%</td>
<td>37</td>
</tr>
<tr>
<td>Hispanic</td>
<td>47.25%</td>
<td>17.38</td>
<td>28.57%</td>
<td>83.33%</td>
<td>32</td>
</tr>
<tr>
<td>Risk Profile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>16.75%</td>
<td>4.56</td>
<td>1.95%</td>
<td>26.74%</td>
<td>42</td>
</tr>
<tr>
<td>Black</td>
<td>16.37%</td>
<td>5.69</td>
<td>3.70%</td>
<td>28.93%</td>
<td>42</td>
</tr>
<tr>
<td>Hispanic</td>
<td>11.69%</td>
<td>3.52</td>
<td>3.81%</td>
<td>19.57%</td>
<td>42</td>
</tr>
</tbody>
</table>

Social mistrust.

To examine the psychosocial explanation of the income inequality-health relationship that income inequality affects health through reducing the social cohesion or level of trust, researchers have used social capital as a predictor. In this dissertation Kawachi et al’s (1997) measurement of social capital was followed to measure level of social mistrust. Kawachi et al used three different questions from the GSS. These are (1) “Generally speaking, would you say that most people can be trusted or that you can’t be too careful in dealing with people?” (2) “Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?” (3) “Do you think most people would try to take advantage of you if they got a chance, or would they
try to be fair?” The percentage of respondents that agreed with the statement that “you can’t be too careful in dealing with people” was used by Kawachi et al., as an indicator of social mistrust. The percentage of respondents agreeing with the statement that “most people would take advantage of me” was used to measure perceived helpfulness. The percentage of respondents agreeing with the last question was used as an indicator of perceived lack of fairness.

In this dissertation, data from the GSS 2000 shows that these three measures of social capital are highly correlated among themselves (Table 5). Social mistrust and perceived lack of fairness are highly correlated ($r = 0.928$) and this association is statistically very significant ($p < .01$). Similarly, perceived helpfulness is also highly correlated with social mistrust ($r = 0.917$, $p < .01$). Perceived fairness is highly correlated with lack of fairness, too ($r = 0.901$, $p < .05$). Therefore, instead of creating an index for social capital, this study used only one of the three measures, that is, the measure of “social mistrust” (specifically, the percentage of respondents who said “yes” to the statement “you can’t be too careful in dealing with people”).

Table 5

*Correlations among Indicators of Social Capital, GSS 2000*

<table>
<thead>
<tr>
<th></th>
<th>BIMR</th>
<th>Black Gini</th>
<th>Mistrust</th>
<th>Fairness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Gini</td>
<td>.358*</td>
<td>(.020)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social mistrust</td>
<td>.248</td>
<td>.385*</td>
<td>(.113)</td>
<td>(.012)</td>
</tr>
<tr>
<td>Lack of fairness</td>
<td>.154</td>
<td>.422**</td>
<td>.928**</td>
<td>(.332)</td>
</tr>
<tr>
<td></td>
<td>(.113)</td>
<td>(.005)</td>
<td>(.000)</td>
<td></td>
</tr>
<tr>
<td>Perceived</td>
<td>.042</td>
<td>.258</td>
<td>.917**</td>
<td>.901**</td>
</tr>
<tr>
<td>helpfulness</td>
<td>(.794)</td>
<td>(.099)</td>
<td>(.000)</td>
<td>(.000)</td>
</tr>
</tbody>
</table>

* $p < .05$;  ** $p < .01$
In the GSS, the question for the variable TRUST was stated as “generally speaking, would you say that most people can be trusted or that you can’t be too careful in life.” The responses were categorized as: “most people can be trusted = 1”, “can’t be too careful =2”, “other, depends =3”, “don’t know =8”, “no answer=9”, and “not applicable=BK.” In the GSS year 2000, 1093 respondents agreed with the statement “can’t be too careful” while 662 respondents agreed with the statement “most people can be trusted.”

To create the variable level of “social mistrust” for this study, TRUST was dummy recoded as “can’t be too careful=1” and “most people can be trusted=0”, and the other response categories treated as “missing.” Three race/ethnicity-specific social mistrust variables (non-Hispanic White mistrust, non-Hispanic Black mistrust, and Hispanic mistrust) were computed from dummy recoded variable level of “social mistrust”. The variable on race/ethnicity was created using two variables from the GSS—HISPANIC and RACESELF. The variable HISPANIC is based on the question “Are you Spanish, Hispanic, or Latino/Latina?” The options were “not Hispanic=1” and a number of Hispanic categories ranging from 2-50. The question asked on RACESELF was “what race do you consider yourself?” The options were “White”, “Black”, “Other,” “Don’t know,” and “not applicable.” From these two GSS variables, three new race/ethnicity variables were constructed for this dissertation. Those who responded “White” on RACESELF but responded “not Hispanic” on HISPANIC were coded as “non-Hispanic White” for this dissertation. Similarly, those who responded “Black” on the “RACESELF” and responded “not Hispanic” on the HISPANIC variable were coded as “non-Hispanic
Black”. Those who responded to any categories (other than “not-Hispanic”) for the HISPANIC question were coded as “Hispanic” for this dissertation.

Since the smallest geographic area that could be identified in the GSS data was region of the country, the race/ethnicity-specific level of social mistrust variables were aggregated by region and used to calculate the percentage of members in a given racial/ethnic group in a given region that indicated that “you can’t be too careful in dealing with people”. This “social mistrust” percentage was then assigned to the states in the sample that belonged to that region. In the 2000 GSS, data on mistrust for Blacks and Hispanics were not available for all the regions. There were no non-Hispanic Black responses on trust related variables from the region “Mountain” which includes New Mexico, Utah, Nevada, Colorado, and Arizona. Therefore, only 37 states had African Americans who responded to the mistrust-related question. Similarly, no responses were available from the Hispanics for the “West North Central region” (i.e., Iowa, Kansas, Minnesota, Missouri, New Hampshire, and Nebraska) and the “East South Central region” (i.e., Alabama, Kentucky, Mississippi, and Tennessee). Therefore, only 32 states had data for Hispanics on the mistrust-related question.

As shown in Table 4 level of social mistrust is the lowest among non-Hispanic Whites. On average, only 36% of Whites agreed with the statement “can’t be too careful” compared with 48% of non-Hispanic Blacks and 47% of Hispanics. The level of social mistrust varies most widely for the Hispanics across the different regions (range =29% to 83%), while for the non-Hispanic Whites the variation of social mistrust is the lowest (range= 29% to 49%). For non-Hispanic Blacks social mistrust (percentage of the population who agreed to the statement “can’t be too careful”) ranges from 38 to 54.
Risk profile.

“Risk profile” was constructed from the LBID dataset to measure the behavioral risk factors of the mother during pregnancy, such as whether the mother used alcohol, whether the mother used tobacco, and/or whether the mother had late or no prenatal care.

In the LIBID dataset, the “month prenatal care was began” was coded as 1 = 1st-3rd month, 2 = 4th-6th month, 3 = 7th-9th month, 4 = no prenatal care, and 5 = unknown or not stated. For this current study, this variable was recoded as a dummy variable where 0 represents prenatal care began from 1st-6th month, and 1 represents “late or no prenatal care” which means prenatal care began at 7th or there was no prenatal care at all. In the LBID dataset, tobacco use during pregnancy was coded as 1 = yes, and 2 = no. For this current study, this was dummy coded as 0 = no tobacco use, and 1 = used tobacco. Similarly alcohol use during pregnancy was originally coded on the LBID database as 1 = yes, and 2 = no. For this study this was also dummy coded as 1 = yes and 0 = no. From the three dummy variables (alcohol use, tobacco use, and late or no prenatal care during pregnancy) the variable “risk profile” was created. If any of the three dummies had a value of 1 then the risk profile dummy variable was considered 1, too. For this dummy variable, 1 represents mother was involved in risky behavior (consumed alcohol, smoked tobacco, and/or had late or no prenatal care), while 0 represents the mother was not involved in any of these “risky” behaviors. Using this dummy variable, the final state-level “risk profile” variable was calculated as the percentage of mothers in a given racial/ethnic group in the state who indicated that they had engaged in at least one of the three risky behaviors.
As shown in Table 4, on average, about 17% of non-Hispanic White women admitted smoking and/or using alcohol, and/or having late or no prenatal care while pregnant, compared to 16% of non-Hispanic Black women and 12% of Hispanic women.

The controls.

Based on the previous research on infant mortality, this study controlled for three state-level variables. These are per capita income, percentage of population that is non-Hispanic Black, and percentage of population that is Hispanic. The average per capita income in the sample states was US$ 21,244.69 (SD = 2813.54). On average, in the sample states 73% of the population is non-Hispanic White, compared to 11% non-Hispanic Black and 9% Hispanic.

Reliability and Validity

The NCHS creates the LBID database by obtaining files from all states. All states link the birth and infant death certificates of the infants for legal and statistical purposes. A uniform coding specification and rigid quality control standards are followed. These data are highly reliable and are the source of official birth and death statistics. If the birth and death of an infant occurs in different states the link is made by the exchange of copies of records between the states. Another data source for this study was the US Census Bureau. It is the largest statistical agency of the Federal Government, and is committed to maintain validity of its data. The Census Bureau uses sound and reliable analytical techniques to provide information that is accurate, reliable and unbiased (Clark, 2006).
The third data source was the General Social Survey (GSS), which is conducted by National Opinion Research Center (NORC). NORC is a Social Science Research Center at the University of Chicago, and is funded by the National Science Foundation (Roper Center for Public Opinion Research, 2008). The GSS Cumulative File is widely used by social scientists, students, policy makers, and others to examine social changes within United States and to compare United States with other nations. The GSS employed a full probability sampling for the year 2000. Data from the personal interviews were processed following the standard procedures for national surveys (Davis, Smith, & Marsden, 2003).

As mentioned earlier, the units of analysis for this study were the 42 states of the US. The advantage of using states as the units of analysis is that it ensures the availability of data and the greater reliability of data. IMRs at the state level are less affected by unusual fluctuations in infant deaths from year to year.

Statistical Procedures

As discussed earlier, three hypotheses were tested in this study. For clarity’s sake, they are provided once again below.

H₁: All else equal, the racial/ethnic-specific IMR will tend to be higher in areas where the level of inequality within the racial/ethnic group is higher.

H₂: All else equal, the effect of income inequality on infant mortality within a given racial/ethnic group is mediated by the level of social mistrust in that racial/ethnic group.
H$_3$: All else equal, the effect of income inequality on infant mortality within a given racial/ethnic group is mediated by the risk profile of the mothers in that racial/ethnic group.

All three of the hypotheses were tested using linear regression. To test Hypothesis 1, two regression models were estimated for each racial/ethnic group. In model 1, the race/ethnicity-specific IMR was regressed on the intra-race/ethnicity-specific level of income inequality without using any control variables. In model 2, the controls (per capita income in the state, percent of state population that is Hispanic, and percent of state population that is Black) were added.

To test Hypotheses 2 and 3, level of social mistrust and risk profile were examined as mediators. The meditational model suggested by Baron and Kenny (1986) was followed in this study. According to them, “mediators explain how the external physical events take on internal psychological significance” (p. 1176). As illustrated in Figure 1, for a variable to be considered as a mediator three conditions must be met: (1) path a: variation in the independent variable (e.g., level of race/ethnicity-specific income inequality) significantly accounts for variation in the proposed mediating variable (e.g., in Hypothesis 2 average level of social mistrust); (2) path b: variations in the proposed mediating variable (e.g., mistrust) significantly account for variations in the outcome or dependent variable (e.g., racial/ethnic-specific IMR); and (3) path c: controlling for the effects of the mediating variable (e.g., mistrust), a previously significant relation between the independent and dependent variables (e.g., income inequality and IMR) is reduced or no longer significant.
Meditational analyses were conducted only for each of those racial/ethnic groups for which the first research hypothesis (H1) was supported—that is, all else equal, the racial/ethnic group’s IMR was found to be positively affected by the level of income inequality in the group. For each racial/ethnic group meeting this condition, the first mediational analysis (corresponding to the second H2) examined the role of level of social mistrust in the racial/ethnic group as a mediator. The second mediational analysis (corresponding to the third hypothesis H3) considered the role of risk profile of mothers in the racial/ethnic group as a mediator.

In order to detect any multicollinearity problems, collinearity statistics were examined. Specifically, for each of the regressions estimated, the tolerance or proportion of variation in each of the predictors that is independent or not shared with other predictors was examined. All of the tolerance levels were above the conventionally accepted “cutoff” of .2 (Hamilton, 1992. p. 134), which suggests that
multicollinearity was not a problem in this study. The regression results are presented in the next chapter.
CHAPTER IV

RESULTS

This chapter provides results of the data analysis. The objective of the study was to examine whether income inequality explains the higher infant mortality rates (IMRs) of non-Hispanic Blacks. Guided by this major research question, three hypotheses were tested.

Hypothesis 1

All else equal, the racial/ethnic-specific IMR will tend to be higher in areas where the level of inequality within the racial/ethnic group is higher.

To test Hypothesis 1, race/ethnicity-specific IMRs were regressed on race/ethnicity-specific income inequality or Gini coefficients. As Model 1 in Table 6 shows, among non-Hispanic Whites level of intra-race income inequality was not a significant predictor of their IMRs ($p > .05$, one-tailed test). Indeed, level of White intra-race income inequality continued to have no significant effect on White IMRs in Model 2, with controls added. These controls explained almost 48% of the variation in White IMRs. Both per capita income and percent Hispanic had significant negative effects on White IMRs ($p < .05$, one-tailed test). That is, all else equal, White IMRs tended to decrease with increases in both of these control variables, with per capita income having the strongest effect (with a standardized coefficient estimate of -.599 compared to -.285 for percent Hispanic).
Table 6

Results of Regressions of White Infant Mortality on White Intra-Racial Income Inequality
(N= 42)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unstandardized (Standard Errors)</td>
<td>Standardized</td>
<td>Unstandardized (Standard Errors)</td>
<td>Standardized</td>
</tr>
<tr>
<td>White Intra-racial Gini</td>
<td>.004 (.071)</td>
<td>.009</td>
<td>.006 (.062)</td>
<td>.013</td>
</tr>
<tr>
<td>Controls</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per capita income</td>
<td>-.000*** (.000)</td>
<td>-.599***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Black</td>
<td>.004 (.013)</td>
<td>.040</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Hispanic</td>
<td>-.028* (.013)</td>
<td>-.285*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>5.611* (3.121)</td>
<td>9.850***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>.000</td>
<td>.476</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S_E</td>
<td>.922</td>
<td>.694</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>F(1,40),.003</td>
<td>F(4,37)8.399***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01; *** p < .005; one-tailed tests

For non-Hispanic Blacks, intra-racial income inequality was a statistically significant predictor of their IMRs (Table 7). In both the models (without and with controls) Black income inequality had a statistically significant positive effect on Black IMRs. In Model 1 of Table 7, with each additional point increase of in the level of Black intra-race income inequality, the Black IMR increased by 0.333 per 1000 live births (p < .01, one-tailed test). In Model 2 of Table 7, with the inclusion of the control variables, the effect of intra-race inequality was slightly reduced but remained positive and statistically significant (p < .05, one-tailed test). Interestingly, none of the controls in the model was significantly related to the Black IMR.
Table 7
Results of Regression of Black Infant Mortality on Black Intra-Racial Income Inequality (N=42)

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Black infant mortality</th>
<th>Unstandardized and Standardized Coefficients</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unstandardized (Standard Errors)</td>
<td>Standardized</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unstandardized (Standard Errors)</td>
<td>Standardized</td>
<td></td>
</tr>
<tr>
<td>Black Intra-racial Gini</td>
<td>.333**</td>
<td>.358**</td>
<td>.286*</td>
</tr>
<tr>
<td>Controls</td>
<td></td>
<td></td>
<td>.308*</td>
</tr>
<tr>
<td>Per capita income</td>
<td></td>
<td>.000</td>
<td>-.060</td>
</tr>
<tr>
<td></td>
<td>(.137)</td>
<td>(.156)</td>
<td></td>
</tr>
<tr>
<td>Percent Black</td>
<td></td>
<td>.033</td>
<td>.111</td>
</tr>
<tr>
<td></td>
<td>(.050)</td>
<td>(.048)</td>
<td></td>
</tr>
<tr>
<td>Percent Hispanic</td>
<td></td>
<td>.030</td>
<td>.100</td>
</tr>
<tr>
<td></td>
<td>(.048)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-2.104</td>
<td>.673</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(6.324)</td>
<td>(8.568)</td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>.128</td>
<td>.147</td>
<td></td>
</tr>
<tr>
<td>$S_E$</td>
<td>2.652</td>
<td>2.727</td>
<td></td>
</tr>
<tr>
<td>$F$</td>
<td>$F_{(1,40)}$ 5.878*</td>
<td>$F_{(4,37)}$ 1.597</td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$;  ** $p < .01$;  *** $p < .005$; one-tailed tests

Table 8 presents the regression results for Hispanics. The results indicate that, on average, the level of Hispanic intra-ethnicity income inequality in a state did not have a statistically significant effect on the Hispanic IMR in the state, with or without the controls added ($p > .05$, one-tailed test). The results for Model 2 also indicate that none of the control variables had an effect on Hispanic IMRs.
Table 8

Results of Regressions of Hispanic Infant Mortality on Hispanic Intra-Ethnicity Income Inequality (N=42)

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Hispanic infant mortality Unstandardized and Standardized Coefficients</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unstandardized (Standard Errors)</td>
<td>Standardized</td>
<td>Unstandardized (Standard Errors)</td>
</tr>
<tr>
<td>Hispanic Intra-ethnicity Gini</td>
<td>.007 (.095)</td>
<td>.012</td>
<td>.021 (.101)</td>
</tr>
<tr>
<td>Controls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per capita income</td>
<td></td>
<td></td>
<td>.000 (.000)</td>
</tr>
<tr>
<td>Percent Black</td>
<td>-0.20 (.033)</td>
<td>-0.608</td>
<td></td>
</tr>
<tr>
<td>Percent Hispanic</td>
<td>-0.026 (.031)</td>
<td>-0.841</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>5.841 (4.161)</td>
<td>4.480 (4.739)</td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>.000</td>
<td>.034</td>
<td></td>
</tr>
<tr>
<td>$S_E$</td>
<td>1.754</td>
<td></td>
<td>1.792</td>
</tr>
<tr>
<td>F</td>
<td>$F_{(1,40)}.006$</td>
<td></td>
<td>$F_{(4,37)}-326$</td>
</tr>
</tbody>
</table>

* $p < .05$; ** $p < .01$; *** $p < .005$; one-tailed tests

In sum, regarding Hypothesis 1, it was supported only for non-Hispanic Blacks, and not supported for non-Hispanic Whites or Hispanics. Thus, all else equal, Black IMRs tended to be higher in states where the level of Black intra-racial income inequality was high. For non-Hispanic Whites and Hispanics the level of intra-racial/ethnicity income inequality did not have any statistically significant effect on their group’s infant mortality, and therefore, no meditational model was examined for them while testing Hypotheses 2 and 3.
Hypothesis 2

All else equal, the effect of intra-racial/ethnic income inequality on racial/ethnic-specific infant mortality is mediated through the level of social mistrust in the racial/ethnic group.

Since the level of intra-racial income inequality was significant only for non-Hispanic Black infant mortality, the second and third hypotheses were tested only for non-Hispanic Black IMRs. To test Hypothesis 2, whether Black level of social mistrust mediates the relationship between within-Black income inequality and Black infant mortality, three regression equations were estimated. Results are presented in Figure 2. As described by Baron and Kenny (1986), three conditions must be met to establish mistrust as a mediator. First, income inequality (independent variable) must affect mistrust (mediator) in the first equation. Second, income inequality (independent variable) must affect infant mortality (dependent variable) in the second equation. Third, mistrust (the mediator) must affect the infant mortality (dependent variable) in the third equation, and the effect of income inequality (independent variable) on infant mortality (dependent variable) must be less in the third equation than in the second.

Table 9 presents the regression results of the mediational model for Black social mistrust. In the first step, within-Black income inequality was found to have a significant effect on Black mistrust ($p < .01$). However, the effect was in the negative direction, which suggests that the higher the level of Black intra-racial income inequality in an area is, the smaller the percentage of Blacks who expresses mistrust tends to be (i.e., the percentage of Blacks who responded “yes” to the statement “you can’t be too careful in dealing with people”). Only one other predictor, one of the control variables, per capita income, was found to have a significant effect on Black mistrust ($p < .001$).
Specifically, all else equal, as per capita income increased at the state level, the percentage of Blacks who expressed social mistrust tended to decrease.

In the second step of the meditational analysis, Black infant mortality was regressed on Black intra-racial income inequality and controls. As expected, Black intra-racial income inequality was found to have a statistically significant positive effect on Black infant mortality ($p < .05$). And, in step three, when the mediator Black mistrust was included, Black intra-racial income inequality still had a significant, positive effect ($p < .05$). But Black mistrust did not have any statistically significant effect in this equation on Black infant mortality ($p > .05$). Thus, taken together, the results presented in Table 9 do not provide support for racial-specific level of mistrust as mediating the relationship between level of intra-racial inequality and race-specific IMR among non-Hispanic Blacks in the US.

Figure 2 presents the path diagram of this meditational model. The regression results indicate that in path a and b, income inequality was a significant predictor of both Black mistrust (although in the “wrong” direction) and Black infant mortality. Thus, the first two conditions of mediation set by Baron and Kenney were met. But in path c, Black mistrust did not have any significant effect on Black infant mortality rate, which violates the third condition for meditational model. It can be concluded, then that Hypothesis 2 was not supported by the data. That is, it appears that Black mistrust does not mediate the positive effects of the level of Black intra-racial income inequality on Black infant mortality.
Table 9

*Linear Regressions of the Independent Variable Black Intra-Racial Income Inequality on the Hypothesized Mediator Black Intra-Racial Mistrust (Step 1), and of Black Infant Mortality on Black Income Inequality (Step 2) and on both Black Income Inequality and Black Mistrust (Step 3) (N=37)*

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>Black mistrust (Step 1)</th>
<th>Black infant mortality (Step 2)</th>
<th>Black infant mortality (Step 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Black income inequality</td>
<td>-.464**</td>
<td>.466**</td>
<td>.348*</td>
</tr>
<tr>
<td>Per capita income</td>
<td>-.514***</td>
<td>.149</td>
<td>.018</td>
</tr>
<tr>
<td>Percent Black</td>
<td>.251</td>
<td>.180</td>
<td>.244</td>
</tr>
<tr>
<td>Percent Hispanic</td>
<td>.136</td>
<td>-.304*</td>
<td>-.270*</td>
</tr>
<tr>
<td>Black mistrust</td>
<td>____</td>
<td>____</td>
<td>-.255</td>
</tr>
<tr>
<td>R²</td>
<td>.352</td>
<td>.335</td>
<td>.377</td>
</tr>
<tr>
<td>F</td>
<td>F(4,32) 4.344***</td>
<td>F(4,32) 4.027**</td>
<td>F(5,31) 3.749**</td>
</tr>
</tbody>
</table>

* p < 0.05; ** p < 0.01; *** p < .001 (one-tailed tests); ____ not applicable.

**Note:** All coefficient estimates are standardized.

![Diagram](image)

*Figure 2. Black mistrust as mediator of Black income inequality effects on Black infant mortality.*
Hypothesis 3

All else equal, the effect of intra-racial/ethnic income inequality on racial/ethnic-specific infant mortality is mediated through the risk profile of mothers in the racial/ethnic group, namely, the percentage who used late or no prenatal care, engaged in smoking, and/or consumed alcohol while pregnant.

Similar to Hypothesis 2, in order to test Hypothesis 3 a series of equations was estimated. As before, since the results examining the first hypothesis indicated that only non-Hispanic Black IMRs were positively influenced by Black intra-racial income inequality, mediation Hypothesis 3 was tested for non-Hispanic Blacks only. To test the hypothesis, whether Black intra-racial risk profile is a mediator between the effects of Black intra-racial income inequality on Black infant mortality, three sets of equations were estimated only for Blacks. In step 1, Black risk profile was regressed on Black intra-racial income inequality. In step 2, Black infant mortality was regressed on Black intra-racial income inequality. And, in step 3, Black risk profile was included as a predictor along with Black intra-racial income inequality.

Table 10 presents the regression results for the meditational model for Black risk profile. Black intra-racial income inequality is a significant predictor of both Black risk profile and Black infant mortality. All else equal, with every point increase of Black income inequality, the percentage of Black pregnant women who engaged in risky behaviors (e.g., used tobacco and/or consumed alcohol and/or had no or late prenatal care) also tended to increase ($p < .01$). In step 2 without the mediator Black risk profile, Black intra-racial income inequality again remains a significant predictor of Black infant
mortality \((p < .05)\). In step 3, when the mediator Black risk profile was added, Black income inequality was no longer significantly related to Black infant mortality \((p < .05)\). In addition, Black risk profile emerged as a significant predictor of Black infant mortality \((p < .05)\).

Table 10

*Linear regression of Black Intra-racial Risk Profile on Black Intra-racial Income Inequality (step 1), and of Black Infant Mortality on Black Income Inequality (step 2) and on Both Black Risk Profile and Black Income Inequality (step 3) (N=42)*

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>Black risk profile</th>
<th>Black infant mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1 B</td>
<td>Step 2 B</td>
</tr>
<tr>
<td>Black income inequality</td>
<td>.293**</td>
<td>.308*</td>
</tr>
<tr>
<td>Per capita income</td>
<td>-.096</td>
<td>-.060</td>
</tr>
<tr>
<td>Percent Black</td>
<td>-.703***</td>
<td>.111</td>
</tr>
<tr>
<td>Percent Hispanic</td>
<td>-.420***</td>
<td>.100</td>
</tr>
<tr>
<td>Black risk profile</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>R²</td>
<td>.455</td>
<td>.147</td>
</tr>
<tr>
<td>F</td>
<td>(F_{(4,37)} ) 7.718**</td>
<td>(F_{(4,37)} ) 1.597</td>
</tr>
</tbody>
</table>

*p < 0.05; **p < 0.01; ***p < .001.(one-tailed tests); ____ not applicable

*Note: All coefficient estimates are standardized.*
Figure 3. Black risk profile as mediator of Black income inequality effects on Black infant mortality.

These relationships are depicted in Figure 3. All paths are statistically significant in the expected directions. On paths $a$ and $b$, Black intra-racial income inequality had a positive effect on both Black risk profile and Black infant mortality. On path $c$, where the mediator was added in the equation, the mediator Black risk profile was significantly and positively related to the dependent variable Black infant mortality, and, in addition, the effect of Black income inequality was no longer significant. Black risk profile, therefore, meets all the three of Baron and Kenney’s (1986) conditions of mediation. Hypothesis 3, therefore, was supported for non-Hispanic Blacks. As the level of Black intra-racial income inequality increases, it appears that Black mothers’ level of involvement in risky behavior such as no or little prenatal care and/or drinking and/or smoking tends to increase. Black intra-racial income inequality affects Black infant mortality through increasing the likelihood of Black pregnant women’s risky behaviors. These findings are discussed in the next chapter.
CHAPTER V
DISCUSSION

The central finding of this research is that high intra-racial income inequality is associated with high infant mortality rates (IMRs) for non-Hispanic Blacks. This association remained significant but was reduced moderately with inclusion of controls such as per capita income and racial composition of the state. This indicates that the effect of intra-racial income inequality for African-Americans is not spurious, and that intra-racial income inequality has an independent association with infant mortality for the racial group.

The intra-racial income inequality and infant mortality relationship, however, did not hold for non-Hispanic Whites or Hispanics. The intra-racial Gini does not have any association with infant mortality for either racial/ethnic group, with or without the controls in the equation. There are several possible explanations for why the intra-racial income inequality effect holds only for non-Hispanic Blacks, and not for non-Hispanic Whites or Hispanics. First, the significant health effect of intra-racial Gini for African-Americans supports Wilkinson’s argument that health effect of inequality is likely be greatest for those who are already disadvantaged in society (Soobader & LeClere, 1999; Wilkinson, 2006). In particular, when compared to other racial/ethnic groups in the US, African-Americans tend to both perceive and experience more discrimination (Wilkinson, 1980).

In addition to the perception and experience of discrimination, there are a number of adverse life events that might contribute to the increased risk of negative health outcomes for Blacks who are already at greater risk of feeling relative deprivation. These include the rising number of single-parent households and absent
fathers, and also the higher incarceration rates of Black men. Though studies in the past have examined the effects of absent fathers on children’s drop out from school, delinquency, sexual activity, and psychiatric problems (Salem, Zimmerman, & Notaro, 1998), not much is known about the association of absent fathers and birth outcomes. Similarly, prior research shows that the high rate of imprisonment of Black males is associated with many other social problems such as low wages, unemployment, and family instability (Pettit & Western, 2004). While the lifetime risk of imprisonment is 28.5% for Black men, this rate is only 4.4% for the White men (Bonczar & Beck, 1997). This disproportionate imprisonment of Black males is likely to have a negative effect on birth outcomes through increased stress and other psychosocial risks.

The second possible explanation of why the relationship does not apply to non-Hispanic Whites or Hispanics is that compared to African-Americans, these two racial/ethnic groups tend to have lower intra-racial inequality (Table 4). As the data of this study demonstrate, the state-level intra-racial income inequality or intra-racial Gini is highest among African-Americans. In addition, African-Americans are more likely to be concentrated or live in racially segregated areas (US Census Bureau, 2000) or urban areas where inequality may be the highest in the state. In addition, low-inequality states are more likely to have fewer Blacks. Therefore, the detrimental effect of intra-racial inequality on health is likely to be more strongly pronounced for Blacks. As Blau and Blau’s (1982) relative deprivation hypothesis explains, since African-Americans tend to be the most residentially segregated of race/ethnic groups in the US, they are likely to see other Blacks as their “reference group”, and not the total population as the whole or other racial/ethnic groups, such as Whites or Hispanics.
For non-Hispanic Whites, although within-race inequality was not associated with within-race infant mortality, per capita income and proportion of Hispanics in the state were significant predictors. For example, in states with high per capita income, White infant mortality tended to be low. This is not an unexpected finding as higher per capita income indicates that the state is richer and, therefore, has better health indicators. It is, however, interesting that according to this current study, as the share of Hispanics in the state population increases, White infant mortality tends to decrease. This is similar to the finding of McLeod et al (2004) that the states with a relatively larger population of Hispanics tended to have lower rates of White infant mortality. Since in general Hispanic infant mortality is lower than among non-Hispanic Whites, they suggest that this effect is may be compositional rather than contextual. Franzini et al (2001) had a similar finding that the relation of mortality and income is affected by the relative size of Hispanic population. While there is no clear consensus among researchers regarding this relationship, Franzini et al (2001) suggested that the communities with strong Hispanic presence might have some unique characteristics that affect mortality.

Although the findings of this study are contradictory to some prior ones where the income inequality and race-specific health link was not supported, it is noteworthy that in many of these studies the lack of association was attributed by the researchers with the limitations of the sample or data or the models they used. For example, in a similar study to this current one, McLeod et al (2004) did not find any effect of race-specific Gini on race-specific infant mortality. They were not able to explain this lack of association and suggested that this might be due to the controls they used or due to the nature of the data. Another study found that the effect of income inequality is the strongest for the
near-poor White men and women, but not for the Black men, and concluded that this may be due to the much smaller sample size of Blacks compared to Whites in the dataset used, which was drawn from the National Health Interview Survey (Lochner et al., 2001).

It is noteworthy that Hispanic infant mortality is not affected by within-Hispanic income inequality. Past literature suggests that for Hispanics there might be some cultural protective factors that explain their favorable birth outcomes (Cervantes, Keith, & Wyshak, 1999; Fuentes-Afflick; Hessol, & Pérez-Stable, 1999; Markides & Coreil, 1986; Ventura et al., 1985; Leslie, Galvin, Diehl, Bennett, & Buescher, 2003; McGlade et al., 2004). These protective factors include social support during maternity, abstinence from alcohol and smoking and healthy diet. Another possible reason that no statistically significant intra-ethnic Gini effect was found for Hispanics may be that the in-group identification process works very differently for Hispanics compared to African-Americans. It is possible that many of them may more strongly identify themselves with the national ethnic subgroups/labels within the “Hispanic” population, such as “Mexican”, “Cuban”, and “Puerto Rican,” rather than with a larger Hispanic or Latino community (Tropp & Wright, 1999). Nativity status may be another factor that plays a role in the ethnic identity of the Hispanics and therefore determining their reference group against which they may feel relative deprivation. Those born outside the United States may be more likely to use a label referring to their racial origin and compare themselves with a group from that country of origin (Yip, Gee, & Takeuchi, 2008). Therefore in this current study, computing the Gini coefficient using the distribution of
household income among “Hispanics” as a whole in the state might not have correctly reflected their sense of relative deprivation.

The second most important contributions of this study to the existing research literature are the findings about the mediator of the income-inequality and health link among non-Hispanic Blacks. In this current study there was no evidence that level of mistrust mediates the inequality-health relationship, which is inconsistent with the evidence presented by Kawachi et al (2004). Their findings suggest that income inequality leads to higher mortality through disinvestment in social capital (lack of trust and group memberships).

The failure to observe any mediating effect of mistrust in this dissertation is probably due to some weaknesses of the mistrust variable. The variable was constructed from GSS data. These data were limited in several ways. First, the lowest geographic level available in the data was “region” not “state.” Thus, while all the other variables in this study were aggregated at the state level, the mistrust variable was available only at the region level. The calculated mistrust “score” for a given race/ethnicity group in a region was used for each of the states in that region.

Second, there were some regions in which there was no response from a non-Hispanic Black or Hispanic on the “mistrust” question used to construct the variable. For example, no response was available on the question from a Black in the region “Mountains” (which includes New Mexico, Utah, Nevada, Colorado, and Arizona). Hence, the number of states included in the analyses involving the mistrust variable was reduced. Kawachi et al (2004) attempted to overcome this data problem to some extent
by averaging responses across 5 survey years; however they still ended up with only 39 states in their analysis.

Although there was no evidence in the current study that trust is a mediator of the inequality-health relationship, there was some evidence that, at least for non-Hispanic Blacks, the risk profile of mothers in the racial group mediates the effect of within-race inequality on birth outcomes in the racial group. With an increase of income inequality within the group the pregnant mother’s risk tends to increase. That is, she is more likely to smoke, drink, and/or participate in late or no prenatal care. This tends to result in higher infant mortality. Consistent with Wilkinson’s psychosocial environment interpretation of the inequality-health link, this study shows that inequality affects health by increasing stress-induced behavior in the population, or, in other words, by increasing the likelihood of risky health behavior.

This evidence in support of Wilkinson’s psychosocial interpretation does not necessarily mean that the neo-materialist interpretation is incorrect. Since this study did not examine the effects of potential neo-material factors (for example, the level of underinvestment in social education or accessible health care), it is beyond the scope of this study to draw any conclusion about the neo-materialist interpretation of the income inequality and health link. The latest research from the National Institute of Health (NIH) suggest factors such as preterm delivery, air pollution, and Sudden Infant Death Syndrome (SIDS) as some of the most important causes of infant deaths and the racial/ethnic disparity of such deaths (NIH, 2008). Although these factors seem to be associated more with material conditions such as health care access, living in high-risk environments due to poverty, or lack of awareness and knowledge, the psychosocial
influence cannot be ignored totally. The NIH findings clearly state that drinking in the first trimester is associated with higher SIDS incidence, and according to the psychosocial environment perspective this drinking behavior could be stress induced. Although the causes of SIDS to some extent are often attributed to biological factors (Stray-Pedersen, Vege, Stray-Padersen, Holmskov, & Rognum, 2008), the almost twice higher rate of infant deaths for Blacks compared to Whites cannot be solely explained by SIDS or other strictly biological factors. Additionally, as indicated by NIH Infant deaths might be higher in areas with high-level of air pollution, but it should be also considered that those areas are more likely to be inner cities or urban areas where inequality (more specifically relative deprivation) is likely to be higher. Future research examining the direct, indirect, and even possibly the moderating effects of psychosocial factors on infant mortality could provide us a better understanding of the income inequality and health link.
CHAPTER VI
SUMMARY AND CONCLUSION

Despite the growing body of research on the inequality effects on health outcomes, not much is known about the race-specific inequality effects on health outcomes. Drawing on Wilkinson’s income inequality hypothesis, this study demonstrates that race-specific or intra-racial income inequality contributes to African-American infant mortality. This study also identifies a plausible mechanism of that link by showing that income inequality affects birth outcomes by increasing the likelihood of that pregnant women will engage in stress-induced behaviors, such as smoking and/or drinking, and/or by limiting their access to or utilization of prenatal care. This chapter discusses the limitations of this study, the policy implications, and directions for future research.

Although this study contributes to our understanding of the income inequality and health link and the predictors of higher African-American infant mortality, there are several limitations. The first limitation of the study is the risk of ecological fallacy while interpreting the study findings. The association of income inequality and health was criticized by Fiscella and Franks (1997) as an ecological fallacy which only reflects the confounding between individual family income and mortality, rather than any wider societal process. This criticism is, however, not valid as in many studies even after controlling for absolute poverty, the association remained significant at the state level (Wilkinson, 1997; Kennedy et al., 1996).
Ecological fallacy occurs when incorrect assumptions are made about individuals based on aggregate data for a group (Babbie, 2001). The data for these study were aggregated from individual level data from the census (such as household income) or GSS data (respondent’s level of trust), or from the LBID (such as smoking during pregnancy). Although the measurement of these variables were at the individual level, due to aggregation at the state level they were transformed into contextual variables (Susser, 1994) or purely ecological variables (Kawachi et al., 2004). A contextual variable is a variable that is obtained from the individual-level but describes place-specific characteristics. As many of the determinants of health operate at the societal or group level, meaningful analyses cannot be done without aggregation of data (Willis, Krewski, Jerrett, Goldberg, & Burnett, 2003). Since both the data analysis and the conclusions were at the group level, to avoid ecological fallacy no inference has been drawn at the individual level.

The second limitation to the present analysis is the inability to use any indicator of perceived inequality. An individual’s sense of relative deprivation is a subjective measure. Perceived relative deprivation should be more accurately measured by individual’s assessment of his/her situation compared to other individuals or social groups. It should be noted that in this quantitative study the subjective feelings of inequality were not captured. Thus, future research integrating quantitative and qualitative data especially regarding perceptions of relative deprivation is warranted.

The third major limitation of this study is that it does not provide us with any information about whether the inequality-health link holds for other race/ethnicity groups in the US, such as Asian-Americans (comprising 4.2 percent of the US population in
2000, according to the US census). Research on the inequality-health link is still predominantly focused on Whites, Blacks, and Hispanics. Due to other racial/ethnic groups’ smaller sizes in any large dataset, there are many statistical limitations of including them in quantitative research. Because of their low presence in many states, the aggregate data could result in missing cases. It is noteworthy that even with Hispanics this present study had to deal with too few cases or missing cases for many states.

Policy Implications and Directions for Future Research

Health disparities among racial/ethnic groups have been one of the major concerns of policy makers. Healthy People 2010 targets this issue very seriously, and is aimed to reduce such health disparities with a variety of programs. In this context, findings of this current study would be valuable to the Healthy People 2010 initiative to design and implement the programs to achieve its goals (US Department of Health and Human Services, 2005). As this study concludes that race-specific inequality affects birth outcomes for Blacks, then, at least theoretically, it could be suggested that redistribution of income would improve their birth outcomes. But such a redistribution is not that simple, and there is still more research needed to fully examine the material dimensions as mediators, as well as controls in that relationship. For example, since Blacks are more likely to be concentrated in higher inequality areas, a measure of racial segregation could improve the models in this analysis. Also, the possible roles of other factors, such as state spending on health care (Mayer & Sarin, 2005), education, or the metropolitan vs. non-metropolitan nature of the residence (McLaughlin et al., 2001),
imprisonment rate of black men, or proportion of absent fathers or single-parent households, should be considered. In other words, more research is needed, even as policy initiatives are being developed.

Other directions for future research include oversampling of small race/ethnic groups in quantitative studies and conducting qualitative studies to gain a deeper understanding of their members’ perceptions. For example, although this study did not find any evidence on mistrust being a mediator, as discussed in Chapter IV, this could be due to the data limitations. Future studies could advance our understanding by using a larger sample on trust for quantitative analysis or using qualitative survey instruments to measure the subjective feelings of relative deprivation.

Finally, this study focused only on infant mortality. And, while, the findings of this study should help health professionals to become better equipped to serve African-American pregnant women who might be at greater risk during pregnancy due to the psychosocial effects of inequality, additional work is needed to see if the study’s findings can be replicated to other types of health outcomes in this, as well as other populations. Other types of health outcomes to be considered include cause-specific mortality, perceived health condition, teen pregnancy, and morbidity rates. All of these efforts would, most certainly, add to our knowledge and, thus, improve our ability to design and implement interventions that will eradicate, or at least decrease dramatically, existing racial/ethnic disparities in health in the US.
REFERENCES


