

EXAMINING THE INFLUENCE OF EXISTING SOCIAL ROLES ON SICK ROLE  
ACCEPTANCE AMONG AFRICAN AMERICAN WOMEN WITH HYPERTENSION

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## **ABSTRACT**

**TAMARA K HICKS: Examining the Influence of Existing Social Roles on Sick Role Acceptance  
Among African American Women with Hypertension  
(Under the direction of Kathleen Rounds)**

This study explored social factors involved in African American women's acceptance of the "sick role" defined as a medical diagnosis of hypertension. The primary purpose of this study was to examine the relationship that an African American woman's existing social roles play in sick role acceptance behaviors, utilizing a role theory and stress and coping theoretical framework. The researcher hypothesized that failure to accept the sick role would be demonstrated by non-adherence to medical recommendations for treatment of hypertension. Conversely, evidence of sick role acceptance would be demonstrated by adherence to a combination of recommended lifestyle modification and prescribed medication. Secondary data analysis was performed with variables extracted from the National Health and Nutrition Examination Survey (NHANES) years 2011 and 2012 (CDC, 2013). The study included a sample of 1476 African American women over the age of 20 years who had been told by a doctor that they have hypertension. Logistic regression analysis was performed for this dissertation analysis as there are several dichotomous outcome variables (medication, salt intake and exercise) as well as multiple categorical independent variables (marital status, parental status and employment status). The findings of this study indicate that we cannot confidently conclude that there is a direct or indirect relationship between social roles and sick role acceptance based on the analysis of the NHANES data and were at best only able to estimate the relationships due

to limited variance in the data. This research was tasked with examining the influence of social roles on medical non-adherence in a sample that was nearly fully compliant with medical recommendations for hypertension.

For Skylar Addison, everything I do is for you.

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## **CHAPTER 1**

### **INTRODUCTION**

Cardiovascular disease, particularly coronary heart disease (CHD), is the leading cause of death and disability across almost every racial and gender category in the United States.

*Cardiovascular disease* is a broad term that encompasses a wide variety of heart and blood vessel-related disorders, with CHD being the most common among them. CHD is a condition in which plaque builds up and hardens inside the coronary arteries, thus limiting blood supply to the heart. CHD alone caused approximately 1 of every 7 deaths in the United States in 2011 (Mozaffarian et al., 2015). For women, the mortality rates for cardiovascular disease (23.5%) are higher than those for cancer (22.1%), stroke (6.2%), and chronic lower respiratory diseases (5.9%; CDC, 2010).

In 2011, the rate of death attributable to cardiovascular disease was 229.6 per 100,000 for all Americans (Mozaffarian et al., 2015). Among African Americans, however, those rates were significantly higher: cardiovascular disease rates for African American men (352.4) and women (248.6) eclipsed those of their White counterparts (271.9 for White males, 188.1 for White females; Mozaffarian et al., 2015). Further, mortality is occurring at earlier ages in this population, with African American women experiencing higher CHD mortality among those younger than 55 years compared to White women (Ferdinand, 2007; Mosca et al., 1997; Oflin, Igbo-Pemu, & Bransford, 1999). The age-adjusted risk for CHD among African American

women ages 25 to 54 is higher than for White women of the same age, resulting in a decreased quality of life extending well into older adulthood (Bransford & Ofili, 2000; Gillum, Mussolino, & Madans, 1997; Huffman et al., 2013). This early onset of disease, combined with higher mortality and increased prevalence, underscores the urgency for understanding the factors that contribute to the disparately high prevalence of CHD among African American women as well as strategies for achieving wellness.

## **Hypertension**

Effectively reducing racial disparities for CHD requires identifying and reducing disparities in risk factors (Kanell, 1995). Among African American women, there is a higher prevalence of several modifiable risk factors that contribute to CHD, including diabetes, high cholesterol, physical inactivity, and obesity (e.g., Bello & Mosca, 2004; Danaei et al., 2009; Kannel, 1987; Rosenberg, Palmer, Rao, & Adams-Campbell, 1999). However, hypertension (commonly known as high blood pressure) is the most common CHD risk factor and the primary antecedent to heart failure (Lalande & Johnson, 2008). High blood pressure appears to contribute to the risk for CHD and increases the propensity for it, even in the absence of other conditions presumed to be associated with both (Kannel, Schwartz, & McNamara, 1969).

Blood pressure is essentially the force of blood pushing against the walls of the arteries that carry blood from the heart to other parts of the body. Death from CHD progresses increasingly and linearly as blood pressure increases (Chobanian et al., 2003). Elevated blood pressure is defined by measurements that are in excess of 120/80 mm Hg, with more attention given to an elevated systolic pressure (top number) than the diastolic pressure (bottom number) as a major risk factor for CHD (Elliot, 2007; James et al., 2014). (See Figure 1.) Similarly, the risk of cardiovascular disease also increases progressively throughout the range of abnormal

pressure rates, including the prehypertensive range (120 to 139 systolic pressure or 80 to 89 diastolic pressure; Appel et al., 2006). Importantly, for every 20 mm Hg systolic or 10 mm Hg diastolic increase in blood pressure, the risk of death from CHD doubles (Bielecka-Dabrowa, Aronow, Rysz, & Banach, 2011).

Of concern, women with hypertension experience a risk of developing CHD almost four times that of females with normal blood pressure (Women's Heart Foundation, 2007).

Unfortunately, African American women have among the highest prevalence of hypertension in the world, with age-adjusted prevalence rates of 46.1% (Rogers et al., 2012). Studies (e.g., the Atherosclerosis Risk in Communities Study [ARIC]) have suggested that high blood pressure is a particularly strong predictor of CHD among African American women (Brittain, Taylor, & Wu, 2010; Rosamond et al., 2008).

Figure 1. American Heart Association (AHA) Recommendations for Blood Pressure

Blood Pressure Category	Systolic mm Hg (upper #)		Diastolic mm Hg (lower #)
<b>Normal</b>	<b>less than 120</b>	<b>and</b>	<b>less than 80</b>
<b>Prehypertension</b>	<b>120 – 139</b>	<b>or</b>	<b>80 – 89</b>
<b>High Blood Pressure (Hypertension) Stage 1</b>	<b>140 – 159</b>	<b>or</b>	<b>90 – 99</b>
<b>High Blood Pressure (Hypertension) Stage 2</b>	<b>160 or higher</b>	<b>or</b>	<b>100 or higher</b>
<b>Hypertensive Crisis (Emergency care needed)</b>	<b>Higher than 180</b>	<b>or</b>	<b>Higher than 110</b>

Source: American Heart Association, 2015

**Causes.** Understanding why the burden of hypertension weighs heavily on African American women (and men) is difficult. Behavioral, psychosocial, and biological factors contribute to hypertension in this population including obesity, physical inactivity, low



socioeconomic status associated with low education and unemployment, lack of access to proper health care (often but not exclusively caused by lack of health insurance), and discrimination (Fongwa, 2008; Mendis & Banerjee, 2010). Collins and Winkleby (2002) found that African American women at risk for uncontrolled blood pressure were likely to be those with low levels of education. Additionally, obesity among African American women is at near-epidemic proportions, with an estimated 50% of the population classified as obese—which is two to three times higher than the rate for White women (Allison, Edlen-Nezin, & Williams, 1997).

Given the high prevalence of obesity among African American women, weight reduction is of particular importance for blood pressure control in this population. Although increasing physical activity is an effective way to manage hypertension, African American women are one of the least physically active racial/ethnic/gender groups (Crespo, Smith, Andersen, Carter-Pokras, & Ainsworth, 2000; Martin, Prayor-Patterson, Kratt, Kim, & Person, 2007). Further, African American women are less likely than their White counterparts to regularly participate in other preventive care. In addition they are less likely to have health insurance (Kaiser Family Foundation, 2013), less likely to have a primary care physician or usual source of care (Agency for Healthcare Research and Quality, 2011), and are more likely to utilize emergency care as a usual source of care (Zuckerman & Shen, 2004).

Finally, discrimination has been linked with hypertension. Experiencing discrimination is a stressful event and often occurs over a prolonged period of time. In a meta-analysis conducted by Dolezsar, McGrath, Herzig, and Miller (2014), researchers reviewed 44 studies to determine the magnitude of the association between perceived discrimination and hypertensive status as well as resting systolic and diastolic blood pressure. Their comprehensive systematic review found that there was a small but significant relationship between hypertension and perceived

discrimination. This relationship between hypertension and perceived discrimination was stronger among participants who were older, male, Black, had lower educational attainment, hypertensive (measured), and physician diagnosis as hypertensive status (self-report)” (Dolezar et al., 2014, p. 28). The largest effects were observed for ambulatory nighttime blood pressure and dipping (i.e., having lower blood pressure at night compared to daytime) for African Americans (Dolezsar et al., 2014).

### **CHD and Hypertension Interventions**

Interventions to address hypertension include pharmacological (i.e., medication) or non-pharmacological (i.e., dietary change such as salt reduction, exercise, weight loss, or smoking cessation), with the primary goals of any intervention being to reduce blood pressure and control heart disease (Aljumah & Siddiqui, 2014). In particular, lifestyle interventions that include dietary change and/or increased physical activity have been shown to reduce CHD risk in African American women (Boggs et al., 2011; Martin et al., 2006). This section will briefly provide examples of the evidence in the pharmacological and lifestyle modification intervention literature that targets the reduction of blood pressure in at-risk or currently hypertensive patients.

**Pharmacological treatment and adherence.** Pharmacological treatment intervention studies specific to African American women are sparse. However, in 2014, the panel members of the Eighth Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure provided evidence-based recommendations that included best plans for pharmacological management for both the general population and African Americans. The panel recommended the following treatment guidelines: 1) For adults 60 years or older, pharmacological treatment should be initiated when blood pressure is 150/90 or higher, with the treatment goal of reducing blood pressure to below 150/90; 2) for those under age 60,

pharmacological treatment should be initiated for those with blood pressure of 140/90 or higher; and 3) for African Americans, initial pharmacological treatment should include a thiazide-type diuretic or calcium channel blocker (CCB) (James et al., 2014; Thornton & Wright, 2015). For nonblack populations, angiotensin-converting enzyme inhibitors (ACEI) are recommended in addition to thiazide and a CCB. Thiazide diuretics essentially help reduce fluid accumulation in the body. They work by reducing the ability of the kidneys to reabsorb salt and water from urine, thus increasing the production and output of urine. Calcium channel blockers are used to lower blood pressure by slowing the movement of calcium into the cells of the heart and blood vessel walls, making it easier for the heart to pump, thereby widening blood vessels. As a result, the heart does not have to work as hard, and blood pressure lowers (Johns Hopkins Lupus Center, 2014).

The Agency for Healthcare Research and Quality reviewed the state of the medication adherence literature to determine the effectiveness of patient, provider, and systems and policy interventions in improving medication adherence for several chronic health conditions including hypertension (Viswanathan et al., 2012). Their review found low evidence for the benefit of educational interventions addressing medication adherence for hypertension; low to moderate evidence for the benefits of case management for hypertension; and moderate evidence for pharmacist-led hypertension approaches for reduction of systolic blood pressure (Viswanathan et al., 2012). However, evidence regarding the broad applicability of these approaches was limited, as was the evidence regarding long-term medication adherence or health outcomes.

Prevention and effective control of high blood pressure is critical, but hypertension management can be difficult even with intensive pharmacological therapy (Scisney-Matlock et al., 2009). One potential contributor to this difficulty is patient distrust. Patients are less likely to

accept and/or adhere to treatment if they distrust their medical professional (Chobanian et al., 2003). Conversely, greater interpersonal trust between patient and physician has been found to be a significant predictor of acceptance of recommendations for care (Jacobs, Rolle, Ferrans, Whitaker, & Warnecke, 2006). Cuffee and colleagues (2013) found that in a sample of inner-city African Americans with hypertension, perceived racial discrimination was associated with lower medication adherence, and this association was partially mediated by trust in physicians. (In the study by Cuffee et al., participants were asked, “Have you ever experienced discrimination, were prevented from doing something, hassled or made to feel inferior ... because of your race or color?” in any of seven different settings including a medical care setting.) Distrust of physicians has been shown to be more prevalent among African Americans of lower socioeconomic status (defined by the authors as having lower income, lower education, and no health insurance; Armstrong, Ravenell, McMurphy, & Putt, 2007). Jacobs and colleagues (2006) found that trust in physicians appears to facilitate care-seeking behavior and promotes patient honesty and adherence, while distrust inhibits care-seeking, may result in switching physicians, and may lead to non-adherence.

Because hypertension is considered a result of interactions between genes and environmental management, treatment interventions for hypertension are more successful when multiple factors in the patient’s life are addressed (Gupta & Guptha, 2012). Treatment of hypertension should use a mixed-methods approach emphasizing both drug management and lifestyle modification (Gupta & Guptha, 2012). Lifestyle modifications have been shown to decrease blood pressure, enhance antihypertensive drug efficacy, and decrease cardiovascular risk (Chobanian et al., 2003). In hypertensive individuals, lifestyle modifications can serve as

initial treatment before the start of drug therapy and as an adjunct to drug therapy in persons already on medication (Gupta & Guptha, 2012).

**Lifestyle modification interventions.** Adoption of a healthy lifestyle is critical for the prevention of high blood pressure and an essential part of the management of hypertension for those who have it (Chobanian et al., 2003; Messerli, Williams, & Ritz, 2007). Major lifestyle modifications which have been shown to lower blood pressure include weight reduction in individuals who are overweight or obese (Stevens et al., 2001; Trials of Hypertension Prevention Collaborative Research Group, 1997), adoption of the Dietary Approaches to Stop Hypertension (DASH) eating plan (Appel et al., 2006; Rankins, Sampson, Brown, & Jenkins-Salley, 2005), dietary sodium reduction (Appel, Esepland, Easter, Wilson, & Folmar, 2001; He, Li, & MacGregor, 2013; Trials of Hypertension Prevention Collaborative Research Group, 1997), physical activity (Roberts, Vaziri, & Barnard, 2002), and moderation of alcohol consumption (Fuchs, Chambless, Whelton, Nieto, & Heiss, 2001; Marmot et al., 1994). The primary behavioral interventions recommended to reduce blood pressure are exercise, sodium reduction, and the DASH diet, which can lead to weight loss which is beneficial to overall health (Bacon, Sherwood, Hinderliter, & Blumenthal, 2004). The DASH diet, which “promotes high fruit and vegetable consumption, moderate low-fat dairy products, and low animal protein intake, with substantial amounts of plant protein from legumes and nuts, substantially reduces both systolic and diastolic blood pressure among hypertensive and normotensive individuals” (Fung et al., 2008, p. 713). The following sections review examples of the literature on hypertension management through lifestyle with outcomes targeting weight loss, physical activity, and dietary change in samples that either target or include African American women.

***Weight loss and physical activity.*** African American women experience higher morbidity and mortality than other populations with respect to chronic diseases such as cardiovascular disease, due in part to a higher prevalence of overweight and obesity among this population (Fitzgibbon, Tussing-Humphreys, Porter, Martin Odoms-Young, & Sharp, 2012). As body weight increases, blood pressure generally increases. Overweight persons have an abundance of fatty tissue that increases their vascular resistance, which in turn increases the work the heart has to do to pump blood throughout the body (Schmieder & Messerli, 1993). In light of this fact, weight loss is a recommended intervention for blood pressure reduction in both obese and overweight individuals. Weight loss of as little as 10 pounds (4.5 kg) reduces blood pressure and/or prevents hypertension in a large proportion of overweight persons, although the ideal is to maintain normal body weight, defined as a body mass index of 18.5–24.9 kg/m (Chobanian et al., 2003).

In general, weight loss-targeted interventions utilize a combination of several lifestyle modification techniques, including physical activity and dietary change that in turn facilitate weight loss. For example, Goodpaster and colleagues (2010) initiated a single-blind randomized trial of severely obese men and women, with African American women representing approximately 37% of both the control (the physical activity portion of the intervention was delayed for 6 months) and treatment (diet and physical activity for 12 months) groups. The purpose of the study was to determine the efficacy of a diet and physical activity intervention on severe obesity and whether these changes would differ in African American and White persons. Researchers found that both intervention groups lost a significant amount of weight at 6 months, with the treatment group losing significantly more weight in the first 6 months compared with the delayed-activity group. However at 12 months, study measures including blood pressure

were significantly and similarly reduced in both intervention groups (Goodpaster et al., 2010). African Americans demonstrated slightly less weight loss; however, the intervention was effective both White and African American participants. Dickinson and colleagues (2006) conducted a systematic review of 105 randomized control trials to quantify the effectiveness of lifestyle interventions. Trials included diet, exercise, relaxation, sodium restriction, healing beliefs, and dietary supplements. The review found that exercise interventions led to systolic pressure reductions averaging 4.6 mm Hg, and that compared to other interventions, exercise almost always achieved a significant reduction in blood pressure. The researchers recommended that patients with elevated blood pressure should exercise regularly, as well as follow a weight-reducing diet and restrict alcohol and salt intake (Dickinson et al., 2006).

Finally, Kumanyika, Obarzanek, Stevens, Hebert, and Whelton (1991) compared the race-specific weight loss results from two randomized, multicenter trials: the Hypertension Prevention Trial (HPT) and the Trials of Hypertension Prevention (TOHP). The HPT assessed the effects of weight reduction, decreased sodium intake, and increased potassium intake, separately or in selected combinations, on blood pressure of individuals with normal blood pressure, while the TOHP examined the feasibility and potential efficacy of weight reduction, sodium restriction, stress management, and certain dietary supplements in decreasing or preventing an increase in diastolic blood pressure in individuals who initially had high but normal blood pressure (Kumanyika et al., 1991). The two clinical trials allowed direct comparison of the experiences of African American and White adults. The results of the study confirmed the belief that Whites have greater success than African Americans in losing weight (Kumanyika et al., 1991). Additionally, weight lost by African American women in both the HPT and TOHP was regained within 18 months compared to no net weight gain for White

women. Although low educational attainment is strongly and inversely associated with female obesity, African American women with college degrees were more representative in the intervention. The explanations suggested by the study for the racial differences in weight loss included a cultural acceptance among African American women of an obesity norm, reduced physical activity in the population, and cultural food preferences as well as biological explanations such as slower metabolism among African Americans. In light of the beneficial impact of weight loss and exercise on hypertension and the persistent disparity in the disease rates among African Americans, research exploring novel explanations for failure to maintain behavior change is imperative.

***Sodium reduction and dietary changes.*** While exercise is clearly an important component of many weight loss intervention programs, exercise alone is generally not associated with significant weight loss when diet is not modified (Bacon et al., 2004). There is strong evidence across the literature supporting the idea that blood pressure reduction is positively affected by multiple dietary factors including reduction of table salt (individually added) and sodium intake (existing in restaurant or processed and packaged foods), increased potassium intake, moderation of alcohol intake, and comprehensive dietary changes such as adopting the DASH diet or a vegetarian diet (Appel et al., 2006).

Salt” and “sodium” are often used synonymously. They are related but different: salt is 40% sodium (60% chloride), with 1 g of salt containing 400 mg sodium (Frisoli et al., 2012) and a teaspoon of salt containing approximately 2,000 milligrams (mg) of sodium. Although sodium is important to the body, too much overloads the kidneys and results in excess sodium leaking into the bloodstream. More sodium in the blood draws more water into the blood (i.e. water retention), increasing volume and raising blood pressure. This places increased burden on the



heart. Current recommendations suggest upper limits of 2,200-2,300 mg of sodium per day; however, the suggested sodium intake for African Americans is far lower, at 1500 mg (CDC, 2012; Mayo Clinic, 2015). While reducing sodium intake involves the reduction of table salt, a large portion of the sodium in a person's diet is a result of processed and packaged foods. As such, efforts to reduce blood pressure involve attention to both table salt and sodium as a preservative.

Throughout most of our evolution, humans have consumed less than 0.25 g of sodium per day, but consumption has skyrocketed in recent years, and current sodium consumption averages are more than 3300 mg per day (CDC, 2013; Frisoli, Schmieder, Grodzicki, & Messerli, 2012). There is a consistent dose-response relation between salt intake and blood pressure within the range of 3 g to 12 g of salt per day (Feng & MacGregor 2002). Frisoli and colleagues (2012) found that a reduction of daily salt intake of only 3 g per day (among the hypertensive) predicts a dramatic decrease in blood pressure in hypertensive subjects: a drop of 3.6 to 5.6 mm Hg in systolic pressure and a drop of 1.9 to 3.2 mm Hg in diastolic pressure.

Similarly, Appel and colleagues (2001) evaluated the effects of sodium reduction on hypertension control in older adults ages 60 to 80 years whose blood pressure was controlled by medication. Sodium reduction was addressed with participants through education about sources of sodium (i.e., foods with high salt content) as well as encouragement to adapt a reduced-sodium lifestyle in other environments (e.g., making food choices in restaurants). Their sample was 47% women and 23% African American (both men and women). Overweight participants were assigned to one of four groups: 1) combined weight loss and reduced sodium, 2) reduced sodium only, 3) weight loss only, or 4) usual lifestyle control group. Those who were not overweight were randomly assigned to the reduced sodium or usual lifestyle groups. The study

found that reducing sodium had a substantial impact on blood pressure, lowering systolic pressure by 4.3 mm Hg and diastolic pressure by 2.0 mm Hg.

An even greater decrease in blood pressure can be achieved when reduced salt intake is combined with a dietary intervention such as the DASH diet (Frisoli, Schmieder, Grodzicki, & Messerli, 2012). Utilizing secondary data from the Nurses' Health Study (1980-2004), Fung and colleagues (2008) determined that adherence to a DASH-style diet was associated with a lower risk of CHD and stroke among middle-aged women during 24 years of follow-up. Additionally, Bray and colleagues (2004) analyzed the effects on blood pressure of three levels of sodium intake (three groups: higher, intermediate, and lower levels consisting of 3,450, 2,300, or 1,150 mg per day, respectively) while consuming the DASH diet, in key subgroups including African American women. They found that reducing sodium intake and adhering to the DASH diet consistently resulted in reductions in systolic and diastolic blood pressure across all subgroups. African American women had the most pronounced changes in blood pressure from sodium reduction in both the control (typical American diet) and DASH diet groups. In fact, the greater the reduction in sodium intake (e.g., going from high to low sodium intake), the more distinct the reductions in systolic and diastolic pressure. These results support Sacks and colleagues' (2001) findings that a reduction of sodium to below 2300 mg per day (the intermediate level in the Bray et al. study), in conjunction with the DASH diet, had significant impact on blood pressure.

**Barriers to adherence in African American women.** What remains puzzling is that while the intervention literature is clear that hypertension is a modifiable risk factor for CHD, the burden of disparity in CHD rates remains persistent, debilitating, and deadly for African American women. While it is clear from the literature that pharmacological and lifestyle changes can have a substantial positive impact on CHD and hypertension, long-term adherence to

exercise and dietary regimens remains problematic for this population (Martin et al., 2008; Pekmezi & Jennings, 2009). For example, Epstein and colleagues (2012) found that African Americans were less likely to be adherent to the DASH diet compared with Whites. This failure to consistently engage in the critical health behavior changes necessary to positively impact both the proximal outcome of hypertension and the distal outcome of CHD is of foundational interest in this dissertation research.

While we understand *what* needs to be done to change hypertension and CHD risk among African American women, we still lack a clear understanding of *how* to get this population to utilize efficacious interventions due to an incomplete picture of the internal health-seeking process through which African American women come to make decisions. Researchers have explored various reasons for failure to adopt beneficial dietary and physical activity behaviors among African Americans, including food insecurity (Baskin, 2015), limited access to healthy food (Fongwa et al., 2006), cultural body preferences (Airhienbuwa et al., 1996), neighborhood factors (Lee, Mama, Ho, & Adamus, 2012), and concern about physical activity affecting hairstyles (Hall et al., 2013). However, at the time of this dissertation research, no study had explored the possible links among social role obligations associated with acceptance of a sick role diagnosis as a factor in adherence behaviors to physician-prescribed lifestyle change.

This dissertation research explores factors that influence adherence behaviors in African American women after receiving a diagnosis of hypertension by a doctor or qualified medical professional, referred to as *sick role behavior*. Briefly, individuals occupy one or more social roles (e.g., wife, mother, and employee). Being diagnosed with a sickness, such as hypertension or CHD, presents another role to occupy, the sick role. This dissertation research suggests that interventions aimed at reduction of disparities in health among African American women must

not simply assume that women have accepted this new role of sickness role (in this case a diagnosis of hypertension) and thus, are prepared to take action. Rather, there is an internal conversation that evaluates the cost and benefits of accepting sickness and the obligations that come with that role.

### **The Sick Role**

Kals and Cobb (1966), Mechanic (1962), Parsons (1951), and Rosenstock, (1966) provide useful definitions for categorizing types of health seeking behaviors at various stages of health decision making. Specifically, there are three “stages” of health seeking: *health behavior* (preventative activities that pre-symptomatic individuals undertake to ensure they remain healthy and able to detect and guard against disease), *illness behavior* (those activities in which symptomatic persons engage in order to find a suitable remedy for the condition(s) they are experiencing), and *sick role behavior* (activities directed at achieving wellness, including the recognition of a personally defined illness by significant others or society at large and the legitimization of the illness by a health professional; Mechanic & Volkart, 1961; Parsons, 1951; Rosenstock, 1966). To be sick (in this case to be diagnosed with hypertension) is a deviation from the social norm. According to Talcott Parsons’s (1951) sick role model, when a person’s illness has been legitimized by medical personnel or by intimates and/or persons having influence over him, the person occupies a special role in society (Mechanic, 1986). Individuals move from illness behavior to sick role behavior when symptoms persist and become severe enough to warrant seeking a medical opinion that results in official medical confirmation.

Sickness is a social role, much like being a parent, a single person, or an employee, and as such has expectations and obligations that accompany it. Through the process of legitimization, the sick role can provide the affected individual some relief from his or her

personal social obligations such as the roles of employee or caregiver, as health care seeking takes priority over other behaviors and responsibilities (Mechanic & Volkart, 1961; Parsons, 1951). Parsons's sick role model (1951) states that being sick comes with two major rights and two major obligations: 1) the right to be exempt from normal social roles (e.g., mother, employee) based on the nature and severity of illness; 2) the expectation that as a sick person you need to be taken care of and cannot just get better merely because you want or decide to; 3) the obligation to want to get well (because to be ill is not desirable); and 4) and the obligation to seek competent help to get well (Parsons, 1951; Segall, 1976). Essentially, sick persons have the social obligation to seek and accept relevant help for their illness while sincerely desiring to get better, and the right to be relieved of social responsibilities.

*The Social Work Dictionary* defines *role theory* as the ways in which people are influenced in their behaviors by the variety of social positions they hold and the expectations that accompany those positions (Barker, 1999). *Role strain* is the difficulty persons feel in fulfilling their role obligations (Goode, 1960). A mother may find it difficult to simultaneously nurture and discipline her children. These are competing obligations within one status role. A related concept is *role conflict*, which speaks to the conflict in the demands between several status roles (e.g., student, wife, and mother). Theoretically, the conflict between the demands of a woman's current social identities and the exigencies of her new role as a sick individual could cause role conflict. When individuals have conflicting role obligations, the resulting strain could lead to the rejection of the new role and its responsibilities. Failure to resolve the conflict and accept the new role could cause the individual to remain in the illness behavior stage and could result in underutilization of services, treatment delay, and overuse of the emergency room.

Conversely, the positive impact of a social role is called *role enhancement*. A role enhancement perspective suggests that women with more social roles (seen as socially positive) experience higher levels of emotional health as compared to those with fewer roles (Moen, Robinson, & Dempster-McClain, 1995). For example, being in a marital relationship has been shown to be health-protective for women, while conversely, unemployment and underemployment have been shown to have deleterious effects on the health of single-mothered families (Eamon & Wu, 2011; Ross & Murkowski, 2013). This dissertation proposes to examine both role conflict and role enhancement in sick role acceptance among African American women by hypothesizing that some roles (e.g. married, employed) will contribute to acceptance while some roles will create conflict (e.g. unemployed, single, parent) will increase the likelihood of rejection.

### **African American Women and the Sick Role Behavior in the Literature**

The existing health disparities literature does not clearly document an understanding of sick role behavior in African American women, nor does it document whether they are able to negotiate relief from sociocultural obligations when faced with sickness. Further, it does not indicate whether an inability to obtain such relief results in failure to utilize the known treatment alternatives for hypertension. This omission suggests an important area for study. Despite this lack of knowledge, some inferences can be made from the social roles held by African American women that may conflict with adoption of the sick role. For example, persons with roles such as single head of household or primary breadwinner, single mother, or primary caregiver for a parent or other family member may find it difficult to adopt the sick role, as responsibilities and obligations of their existing roles may compete with the resources necessary to become well. African American women continue to lead the country in the prevalence of single heads of

household compared to women of other racial and ethnic groups (Laosa, 1988; Whitaker, Whitaker, & Jackson, 2014). Finally, African American women are more likely to be the female head of household, and struggle with high poverty rates for those households containing children (Kreider & Ellis, 2011, Snyder, McLaughlin, & Findeis, 2006, U.S. Bureau of the Census, 2009).

African Americans are more likely than other racial and ethnic groups to rely on religious and family support systems rather than formal care (Hargrove, 2006; Pickard, Inoue, Chadiha, & Johnson, 2011), and since caregiving is often perceived as being a woman's role, African American women may find themselves more often taking the role of primary care provider for older family members with significant limitations. Williams, Dilworth-Anderson, and Goodwin (2003) found that when caregivers and care recipients lived together, caregivers reported higher levels of role strain. Further, research has documented that caregiving has been linked to an increased risk of cardiovascular disease in women and is a top barrier to taking preventive health action (Mosca, Mochari-Greenberger, Dolor, Newby, & Robb, 2010). These caregiving roles may be difficult or impossible to negotiate when personal sickness occurs, forcing women to make extremely hard choices between their own needs and the caregiving needs of others.

### **Purpose of the Dissertation**

This dissertation seeks to examine the role that an African American woman's existing social roles play in sick role acceptance behaviors, utilizing a role theory and stress and coping theoretical framework. This dissertation views social roles as containing a type of *resource currency* that a woman can utilize in her pursuit of wellness (e.g., marriage has more resource currency than singleness). Understanding that social roles can be both protective and harmful to health outcomes, it is of interest to understand whether African American women are more or less likely to utilize available resource currency to negotiate the role relief that comes with sick

role acceptance. The researcher hypothesizes that failure to accept the sick role would be demonstrated by neglect of necessary health actions for treatment of hypertension. Evidence of sick role acceptance includes reporting a current reduction of salt intake, currently engaging in physical activity, and taking prescribed medication.

To date, no study utilizing the National Health and Nutrition Examination Survey (CDC, 2011) has examined direct and indirect effects of social roles and sick role acceptance among African American women at risk for CHD indicated by a hypertension diagnosis. Further, to date no study has utilized role theory and stress and coping to understand the stress of health decision making among African American women.

### **Research Questions**

This dissertation research addresses four exploratory research questions. They are as follows:

1. Is sick role acceptance a function of African American women's status role?
  - a. marital status
  - b. employment status
  - c. parental status
2. What are the cumulative effects of having multiple social roles on sick role acceptance?
3. Does having health insurance moderate the relationship between social roles (i.e., marital status, employment status, and parental status) and sick role acceptance?
4. Does having a usual source of care moderate the relationship between social roles (i.e., marital status, employment status, and parental status) and sick role acceptance?



## **CHAPTER 2**

### **LITERATURE REVIEW**

The speed at which people respond to the symptoms of illness can significantly impact their ability to achieve relief and avoid additional adverse health outcomes. It is assumed that the nature and severity of an illness would be the most influential determinant of a person's health actions; however, the ways in which people respond to illness symptoms vary greatly, even among those with similar symptoms. These health decisions to alleviate or ignore symptoms can be influenced by multiple factors including traditions, current social obligations, and culture. While some seek immediate medical attention when symptoms present, others may heed symptoms but practice self-care (e.g., prayer, traditional healing) instead of seeking formal medical care. Still others may choose to ignore the symptoms and take no action. Those persons who move from acknowledgement of illness symptoms to an acceptance of a diagnosis from medical professionals, shift from illness behavior to sick role behavior. To become a legitimized "sick person" is to take on a new social role.

This chapter reviews the literature related to social roles and role theory among women. The relationship between social status and social roles is described, along with role theory and the central tenets (e.g., role conflict and role enhancement) utilized in the conceptual model detailed in Chapter 3. Additionally, the chapter makes a case for connecting the concepts of social status and social roles with the concept of social value, which is hypothesized to be available in some social roles and less available in others. Finally, the chapter reviews the

literature on multiple roles (i.e., parental status, employment, and marital status) and how those roles can have an impact on women's health with attention to African American women in particular.

### **Social Statutes and Social Roles**

At any given time women have several social statuses. For example, women can often be mothers, wives, employees, and heads of household. Linton (1936) defined *status* as an individual's position in the larger social system, where *roles* are the societal expectations ascribed to that position. These two concepts are inseparably linked in that an individual may not have statuses without roles nor have roles without statuses.

These social statuses can be achieved or ascribed (Deaux, Mizrahi, & Ethier, 1995; Jackson, 1962). An individual's *achieved statuses* are merit-based or earned positions. These are statuses that they have worked for, such as professor, social worker, or mother. Conversely, an *ascribed status* is a social position that is not earned, but rather something a person is either born with or had no control over. To be born a female, African American, or in some cases into inherited wealth or poverty are not the result of choice but instead were ascribed. Additionally, there is a *master status* (Hiller, 1982). This status is an individual's most prominent personal status that receives the most focus from others. It is also the status that can impact a person the most. For example, to be seen primarily as a prominent PhD would be an achieved master status; however, to be seen largely as an African American woman would be an ascribed master status. To be sick can be seen as either ascribed or achieved.

Much like actors in a theatrical play whose "parts" are scripted, defined, and predictable, socially defined statuses have outlined expectations, duties, behaviors, and responsibilities. The concept of status is closely linked to the notion of roles. A person occupies a status but plays a

role (Lindesmith & Strauss, 1968), and on any given day people are balancing several sets of expectations and rules of behavior (i.e., roles) directly related to their multiple statuses. Social roles are in essence a set of rules and norms that function as blueprints to guide and socially regulate individual behaviors and activities (Danna-Lynch, 2010). Each social role comes with specific and unique demands with persons behaving in different and predictable ways depending on their respective social statuses and the situation (Biddle, 1986).

There are four basic types of social roles: *basic roles*, which include gender and age roles; *structural status roles*, which include employment, marital status, parental role, and recreational roles that are related to status in a particular organizational setting (e.g., church, sorority); informal *functional group roles*, like mediator and devil's advocate; and *value roles*, like hero, traitor, criminal, and saint (Turner, 1990). This dissertation is primarily concerned with the basic roles of gender and race as well as structural status roles (i.e., parental, marital, and employment).

## **Role Theory**

A person's sense of identity and behavior is often molded by their social position. *Role theory* speaks to a group of concepts that attempt to explain how personal behavior expectations and individual behavior patterns are influenced within the occupied social position (Barker, 1999; Ribbins-McCarthy & Edwards, 2011). It is essentially concerned with 1) patterned and characteristic social behaviors, 2) parts or identities that are assumed by social participants, and 3) the scripts or expectations for behavior that are understood by all and adhered to by the performers (Biddle, 1986). Role theory concepts important to this dissertation research are role overload, role conflict, role strain, and role enhancement. Each is related to sick role acceptance and described further in the next section.

Importantly, the *sick role* was developed from role theory. Like any other role, being sick comes with its own expectations and obligations. To be legitimately labeled a sick person means that an individual is able to negotiate relief from normal social obligations due to health impairment (Mechanic & Volkart, 1961; Parsons, 1951). This negotiation of relief may result in conflict with existing social roles. For example, being diagnosed with CHD may require surgery, multiple doctor visits, medications, and significant down time for healing in order to achieve wellness. However, this new status role may be at odds with the employee roles and the need to negotiate temporary relief from work obligations without termination.

Sickness is a status, and as previously stated, a socially defined position. Over the life course, people transfer into and out of different roles, retaining some, relinquishing others, and beginning new roles (Burr 1972). The acceptance or rejection of this new status role of “sick” requires consideration of personal resources including for example, monetary (e.g., medical insurance), physical (e.g., am I physically able to do the work necessary for healing?), and emotional resources (e.g., social and emotional support), as well as consideration of individual ability to move into this *new* sick role given *existing* social roles social obligations. This process of considering existing resources in accepting the sick role can create stress. Stress related to social roles has been studied as role overload, role conflict, and role strain in the literature.

*Role overload* and *role conflict* tend to be used interchangeably in the literature when in fact they are related but distinct concepts (Coverman, 1989). Role overload refers to issues of time constraints. Simply put, role overload is having too many role demands and too little time to fulfill them. When a person feels his or her role obligations require more time than can allotted, there can be a sense of overload. This evaluation of insufficient time can be a source of stress. The premise of the *role overload hypothesis* states that our human energy is limited, and the

more roles a person occupies, the more strain experienced and the greater the likelihood of negative effects on health and well-being (Goode, 1960; Sieber, 1974). “As role obligations increase, sooner or later a time barrier is confronted that forces the actor to honor some roles at the expense of honoring others” (Sieber, 1974, p. 567).

In contrast, *role conflict* refers to discrepant expectations irrespective of time pressures wherein a person must choose between the expectations of two (or more) statuses and their role obligations because compliance with the expectations of one will violate the expectations of the other (Sieber, 1974). Also sometimes referred to as the *scarcity hypothesis*, it holds that occupancy of more than one social role will cause stress and ill health to the extent that the demands of those roles interfere with each other or create role overload (Lee & Powers, 2002). This might look like a conflict between motherhood and employment or between wife and mother roles. Role overload leads to role conflict only when the demands of one of the multiple roles make it difficult to fulfill the demands of another role (Coverman, 1989).

Goode (1960) originally defined *role strain* as the “difficulty in fulfilling role obligations” (p. 483). In role strain, the conflict comes from the difficulty in managing the expectations and obligations related to *one* status. For example, a woman may find it difficult to reconcile the role demands of motherhood when her role requires protection, correction, and affection towards her children. This conflict causes the person to be pulled in several different directions.

In contrast, the *role enhancement* perspective states that people occupying more roles should experience higher levels of well-being because having more roles leads to an augmentation of the individual’s power, prestige, resources, and emotional gratification (Lee & Powers, 2002; Moen, Robison, & Dempster-McClain, 1995). Verbrugge (1986) found that the physical health of both sexes improved as role involvements increased. Similarly, *role*

*accumulation theory* (Sieber 1974) states that having multiple roles and engaging in a variety of activities can benefit individuals' overall well-being (Black, Murry, Cutrona, & Chen, 2009). Sieber (1974) argued that role accumulation or having multiple roles offers the individual four types of positive outcomes: "(1) role privileges, (2) overall status security, (3) resources for status enhancement, and (4) enrichment of the personality and ego gratification" (p. 569). Sieber (1974) further suggested that role enhancement highlights the potential social and psychological benefits of occupying parent, partner, and paid worker roles and proposed health enrichment as a result of simultaneous participation in these roles. This dissertation explores whether African American women who have been told by a medical professional that they have hypertension (sick role) experience role conflict or role enhancement when considering preexisting social role obligations impacting adherence behaviors to medical recommendations.

### **Status Roles and Social Value**

As previously stated, *status* and *role* are closely related terms. While status is a moniker or title, roles encompass the actual requirements, rights, and obligations attached to the status. However some statuses or positions have some "value," with some statuses (achieved or ascribed) *socially valued* above others. "A status may be ranked on a scale of prestige, according to the amount of social value that is placed upon it relative to other statuses in the same sector of social life" (Goffman, 1951, p. 294). There is more social value, for example, in being a PhD than having a high school diploma. Or an argument can be made that there is more social value in being a White male than an African American woman. This dissertation suggests that some statuses are high in social value (e.g., married mother) and provide a type of capital that can be "spent" on the requirements of the new sick status and its roles, while other statuses will prove to be low in social value (e.g., single mother), making new role acceptance difficult. For example, a

married woman who becomes pregnant may find value in her new motherhood status and its roles relative to the social value she finds in her marriage. In contrast, a single pregnant woman who is unemployed may not find the same value in the new status in light of the “costs” related to the primary requirement of finding work.

As some status roles have more value, it is not a stretch to suggest that a woman considers the value of current status roles (i.e., marital, employment, and parental roles) when considering taking on a new status role (e.g., sick role). In this case a woman diagnosed with hypertension would theoretically consider her other statuses and role obligations as she determines whether the new status role (i.e., sick role) would be acceptable based on the tangible and social value of the other statuses.

**Status-valued characteristics.** There is some support for the concept of status value in the work of Cecilia Ridgeway (1991). Ridgeway described the concept as “status-valued characteristics.” Specifically, she described *nominal characteristics* and *graduated characteristics*, where a nominal characteristic is “any socially recognized attribute on which people are perceived to differ in a categorical rather than graduated or ordinal way” (e.g., ethnicity, sexuality, race, gender; Ridgeway, 1991). Graduated characteristics are those characteristics on which people are perceived to vary in the degree to which they possess the characteristic (e.g., wealth, education; Ridgeway, 1991). These characteristics have status value when there is a consensus in cultural beliefs, such that persons who have one state of the characteristic (e.g., Whites or males) are more worthy in the society than those with another state of the characteristic (Blacks or females; Ridgeway, 1991).

**Subjective social status.** The research on subjective social status (SSS) also supports the concept of personally assigned status value. Specifically, SSS refers to an individual’s perception

of his or her own position in the social hierarchy (Adler, Epel, Castellazzo, & Ickovics, 2000; Jackman & Jackman, 1973). While research using measures of socioeconomic status (SES) focuses on objective measures of social status like occupational status, income, and education, a person's subjective beliefs about their social status can be more consistently and strongly related to overall health compared to objective indicators of social status (Adler et al., 2000). Research suggests that subjective social status is an important predictor of health (Demakakos, Nazroo, Breeze, & Marmot, 2008; Operario, Adler, & Williams, 2004). For example, studies have shown SSS to be independently associated with multiple health outcomes including cardiovascular disease (Ghaed & Gallo, 2007), stress and cortisol levels (Wright & Steptoe, 2005), psychological distress (Sakurai, Kawakami, Yamaoka, Ishikawa, & Hashimoto, 2010), weight status (Adler et al., 2000), physical activity (Frerichs, Huang, & Chen 2014), obesity (Goodman, Adler, Daniels, Morrison, Slap, & Dolan, 2003), and psychological and physiological functioning (Adler et al., 2000). Further, it has been suggested that compared to measures of SES, "assessments of perceived social status may more fully capture the cumulative influences of a social hierarchy on health by taking into account a person's earlier life circumstances, group experiences, family history, and perceived future trajectories" (Wolff, Subramanian, Acevedo Garcia, Weber, & Kawachi, 2010, p. 561).

### **Understanding Social Roles and Health**

A review of the literature on social roles and health must begin with the contribution of sociologist Emile Durkheim and the drawing of a parallel between functionalism and the idea of status or role conflict. *Functionalism* emphasizes the need for stability in society. According to Durkheim, our society is a system of interrelated parts wherein no one part can function without the other. This interrelatedness creates a type of societal balance. Disruption of that stable state



necessitates that society make an adjustment to return to stability. This dissertation research sees social roles in much the same way, ideally functioning together and creating equilibrium for the individual. Role conflict (in this case, sick role presentation), however, is a disruption of that stable state requiring the individual to make adjustments to regain personal balance. Those adjustments could include rejecting the sick role.

“Since Durkheim, the notion that particular configurations of social roles may protect against or increase vulnerability to illness and death has had wide sociological currency” (Nathanson, 1980, p. 460). Durkheim is well known for his work on suicide and social integration, using the concept of *social integration* (the amount of connection between individuals and social institutions) to explain the higher suicide rate among unmarried people. Of particular interest, Durkheim argued that “married persons are more integrated than single, widowed, or divorced persons; widowed or divorced persons are more integrated than single persons; and married persons with children are more integrated than married persons without children” (Breault, 1986, p. 632). He concluded that unmarried persons had fewer social connections to other people and were less likely to feel part of the larger community.

Also of importance to understanding social roles and health outcomes are what Verbrugge and Madans (1985) call the two key processes that underlie the link between involvement in social roles and physical health: social causation and social selection. *Social causation* suggests that our social roles influence our health. Being involved in activities that utilize our skills, cultivate social support and intimacy, and provide resources, such as income, may help maintain or improve overall health (Verbrugge & Madans, 1985). Additionally, social causation speaks to how roles ultimately influence personal response to illness. For example a mother would have to continue to address her household responsibilities (e.g., children,

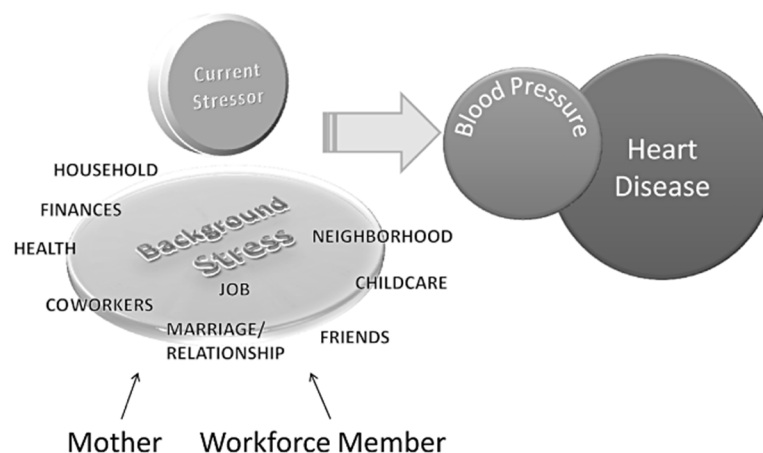
household maintenance) while sick, making her less likely to accept the sick role, whereas a woman with no children may be more likely to accept sickness and all the rights and obligations attached to achieving wellness. In contrast, *social selection* proposes that health influences social roles. When people are in good health, they are more likely to successfully enter roles such as marriage, employment, and motherhood. Together, social causation and social selection are primary factors in the social differences that are observed in health status and therapeutic or medical action (Verbrugge & Madans, 1985).

### **Multiple Social Roles**

The literature is clear that social roles can yield benefits to women's health outcomes. For example, there research has shown health benefits to the pooled resources available in marriage (e.g., Stimpson, Wilson, & Peek, 2012) and employment (e.g., van der Noordt, IJzelenberg, Droomers, & Proper, 2014). It is also the case that women find themselves simultaneously responsible for several roles. These could include management of the family household (wife roles and mothering roles), paired with employment responsibilities. In other cases, women are responsible only for the family household duties absent employment. Women may also find themselves single and employed with no parental responsibilities, and still others balance single motherhood with underemployment. Variations in the singular or combinations of these statuses and their roles have been shown to lead to differentiated health outcomes, both positive and negative. The literature suggests that, the role combination of marriage, employment, and parenthood can be advantageous to health. For example, Verbrugge (1983) found in a survey of Detroit adults that women (and men) who were married, employed, and parents tended to have the best health profiles. In contrast, women with none of these roles, usually older widows, had the worst health (Verbrugge, 1983). However, Verbrugge stated that the good health may be less a result of the *combination* of the roles than the individual effects of *each* role.

In contrast, Terrill, Garofalo, Soliday, and Craft (2012) proposed that having multiple roles is the culprit. Their *background stress model* is an extension of the role strain hypothesis that conceptualized a model of heart disease risk and the underlying stress burden or background stress associated with the demands of women's multiple roles (see Figure 2). Briefly, the authors suggested that the demands of women's multiple roles contribute to chronic underlying stress. As chronic stress is reliably associated with heart disease, multiple roles may play a part in disease risk.

Figure 2. Multiple Roles, Stress Burden, and Heart Disease Risk



Source: Terrill, Garofalo, Soliday, & Craft, 2012

Whether in combination or individually, social roles are impactful in and on the lives of women. The following section provides a more detailed overview of both the combined and individual contributions of marital, parental, and employment status roles in the literature.

**Marital status and health outcomes.** For years the research has supported better physical and mental health outcomes for people who are married relative to those who are unmarried (Schoenborn, 2004). Verbrugge (1979) examined age-adjusted data from the Health Interview Survey, Health Examination Survey, and the 1960 and 1970 U.S. Censuses. Her findings revealed that divorced and separated people experience acute conditions (i.e., injuries,

digestive system conditions, respiratory conditions, parasitic diseases) at a far higher rate than married people. Injuries are of special interest, since distressed people may be careless and incur them more often than other groups (Verbrugge, 1979). Liu and Umberson (2008) reviewed pooled data from 1972 to 2003 looking at self-rated health by marital status; they found that the self-rated health of the widowed, divorced, and separated worsened over time relative to the married, and that the adverse effects of marital dissolution increased more for women than men. Similarly, Schoenborn (2004) examined prevalence estimates by marital status for self-assessed health which included health conditions (back pain, headaches, and serious psychological distress) and health-related behaviors (physical inactivity, overweight or obese weight status, smoking, and drinking) among U.S. adults, using data from the 1999–2002 National Health Interview Surveys. This research found that in general, married adults are healthier than those in other marital status groups, least likely to experience health problems, and least likely to engage in risky health behaviors. However, they were notably more likely to be overweight or obese, with never-married younger women ages 18-44 among the least likely to be overweight or obese. Further, age-adjusted prevalence of self-rated health of “fair or poor” was highest among widowed adults. Additionally, married and never-married adults generally had lower prevalence of the health conditions than adults who were widowed, divorced or separated, or living with a partner.

Interestingly, Waldron, Weiss, and Hugh (1997) sought to test the differential effects of marital status between three groups of women: never married, divorced and separated, and married (widows excluded from analysis due to small number). The authors stated a desire to test health trends among divorced and separated statuses separately; however, health trends were assessed at the five-year follow-up and the duration of separation was considerably shorter than

the five-year interval (Waldron et al., 1997). The study found that never-married women tended to have worse health trends for physical impairments and for overall health problems compared to divorced and separated women. Analysis also revealed that among the women in the study, married women had higher family income and less psychological distress than the unmarried statuses. Finally, the researchers found that the health effects of being never married were as harmful as or somewhat more harmful than the health effects of being divorced or separated.

The theoretical explanations utilized by researchers to understand the effect of marital status on health emphasize one of two models: *the marital resource model* and *the marital dissolution/stress model* (Liu & Umberson, 2008). The marital resource model suggests that marriage provides social support and greater psychological and economic resources, which in turn promote physical health and longevity (Ross, Mirowsky, & Goldsteen, 1990, in Liu & Umberson, 2008), as well as regulation of health behaviors that the married enjoy (Williams & Umberson, 2004). In short, marriage offers unique benefits that cannot be obtained from other types of relationships such as cohabitating or partnered (Waite & Gallagher, 2000). Conversely, the stress model emphasizes the crisis event of marital dissolution, suggesting that the strains of marital dissolution undermine the health of the divorced, the separated, and the widowed, which in turn leads to marital status differences in health (Williams & Umberson, 2004).

**Parental status and health.** “When women become mothers, they continue to function as lovers, daughters, sisters, workers, and friends, [such that] the role of mother has to be negotiated in relationship to other roles” (McBride, 1990, p. 5). The inevitable balancing act created by the addition of this new role results in role enhancement for some and strain or conflict for others. Barnett and Baruch (1987) concluded that mothering roles are generally low in control but high in demands—making them high-strain roles, which can become problematic

and result in stress-related outcomes. The physical and psychological consequences of role accumulation depend not only on the number of roles occupied but on the nature of the particular roles, as roles differ in social value as well as in the patterning of privileges and obligations associated with them (Long & Porter, 1984). For example, the social value of motherhood may differ greatly for a single or young mother when compared to a more mature mother, married or single. In short, role quality is just as important to health outcomes as role quantity.

Boden, Fergusson, and Horwood (2008) studied the negative impact of role quality among those in “early motherhood” (i.e., motherhood in adolescence and early adulthood). Several studies have linked early mothering with significant increases in maternal depression, particularly in the first years (McLennan, Kotelchuck, & Cho, 2001; Schmidt, Wiemann, Rickert, & Smith, 2006; Troutman & Cutrona, 1990). Boden and colleagues (2008) found that this association was non-causal in their sample, as those becoming parents early (prior to age 21) were a population with preexisting characteristics (i.e., poorer educational achievement, lower income, and higher rates of welfare dependence) that place them at risk for mental health problems. When these preexisting characteristics were controlled for, the associations between early motherhood and later mental health became small and insignificant.

Mothering can also negatively impact physical activity. Studies show that having children is highly correlated with physical inactivity; rates of inactivity are far higher for mothers than for women who do not have children (Bellows-Riecken & Rhodes, 2008; Verhoef & Love, 1992). Mothers may exercise less than women without children because of a lack of energy or time. Verhoef and Love (1994), examining the impact of mothering on physical health, also found that mothers exercised less than women without children. Interestingly, their study revealed that the age of the youngest child, the number of children, employment status, and marital status were all

unrelated to level of exercise participation, implying that actual status role of motherhood itself was a barrier to exercising (Verhoef & Love, 1994). The most important barrier to exercise for mothers in their sample was lack of time as a result of family obligations, whereas for women without children, the biggest barrier was lack of self-discipline (Verhoef & Love, 1994).

It is clear that mothering can be a stressful job. Balancing the mothering role in conjunction with additional roles can lead to serious health consequences. In a study utilizing data from the Framingham Study, a large longitudinal study that sought to find the causes of heart disease and stroke, researchers examined data for white-collar (office workers) women with and without children, and found employed women who had three or more children had a higher incidence of cardiovascular disease than employed women who had no children or than housewives with three or more children (Brisson et al., 1999).

**Employment and health.** The past several decades have seen an increase in women's participation in paid employment, particularly married women with children (Cohen & Bianchi, 1999; Percheski, 2008). There are conflicting interpretations of the relationship between employment status and women's health. In the first, employment is negatively related to women's health (especially for married women) because it creates competing expectations and doubles the expected tasks of women (i.e., tasks in the household and at work), creating the so-called "double shift" (Demiral, Ark, & Togrul, 2012; Percheski, 2008). This negative impact has been explained by different models, including *job strain* (Karasek, Baker, Marxer, Ahlbom, & Theorell, 1981), *multiple role conflict* (Martikainen, 1995), *role strain*, and the *scarcity hypothesis* (Annandale & Hunt, 2000), each with the shared premise that a competing number of responsibilities shared between status roles can create distress. In one example, Eamon and Wu (2011) utilized data from the 2004 panel of the Survey of Income and Program Participation

(SIPP) to examine hardships for the single (lone) mother experiencing employment issues (i.e., unemployment and underemployment) compared with those who were adequately employed. The study found that material hardship is common for single-mother families. In addition to being more likely to be having difficulty with at least one basic expense, these families were found to be at risk for at least one medical hardship and problems accessing medical and dental care (Eamon & Wu, 2011). In another study, Brisson et al. (1999) conducted research to determine whether more family responsibilities (including number of children living in the home and the proportion of domestic work required) in combination with job strain would increase blood pressure among white-collar women. The research found that more family responsibilities was associated with significant increases in blood pressure among white-collar women holding a university degree but not for non-degree holders.

Research suggests that employment is *health-positive*, providing important resources such as income, food, and shelter as well as psychosocial benefits such as higher self-esteem and confidence, thereby empowering women and decreasing their dependency on others (Percheski, 2008). The *role accumulation hypothesis* and the *role enhancement hypothesis* have been utilized to support this notion (e.g., Ahmad-Nia, 2002; Waldron, Weiss, & Hughes, 1998). Repetti, Matthews, and Waldron (1989) reviewed the empirical evidence on the effects of paid employment on the mental and physical health of women. They found that employment indeed improved the health of women, both married and unmarried. They also suggested that social support from coworkers and supervisors may play an important role. However, the effects of marriage, parenting, and employment on health outcomes are not equal across all groups of women. The following section reviews these social roles for the population of interest in this dissertation.



## **Social Roles among African American Women**

Despite national efforts to decrease disparities in health between minority and majority groups, chronic illnesses and illness-related complications remain prevalent among African American women. As illustrated in Chapter 1, African American women are at increased risk for coronary heart disease (CHD) due to overwhelming rates of CHD risk factors including overweight/obesity, hypertension, physical inactivity, and diabetes in the population. Explanations for these disparities have included disproportionate poverty rates, unemployment, and low educational attainment, coupled with the stressors of the “double enslavement” of race- and gender-specific stressors (Black, Murry, Cutrona, & Chen, 2009; King, 1988). While the literature on illness prevalence, access to services and insurance, socio-demographics, and illness-inducing stressors is robust, there is a gap in the literature addressing basic questions about the everyday lived experiences of African American woman such as the ability to make ends meet, reactions to life’s stressful circumstances, and the demands of parenting (Black et al., 2009). Building upon the review of the health benefits and consequences of social roles discussed earlier in this chapter, the following section examines the social roles literature for African American women and health outcomes, making inferences where the research is lacking.

**Marriage.** Researchers (e.g., Proulx, Helms, & Buehler, 2007) have established that individuals who are married have better psychological and physical health, with benefits more apparent in women than men (Green, Doherty, Fothergill, & Ensminger, 2012). There are efforts to promote marriage among the socioeconomically disadvantaged based on the assumption that marriage is equally beneficial across all socioeconomic statuses (Choi & Marks, 2013). Given the evidence for the health-protective nature of marriage, the marital trends among African American women may contribute to our understanding of disparities in poor health outcomes.

According to the Pew Research Center, in 2012, 36% of African Americans over age 25 had never been married, with this rate being a significant increase from the 7% to 9% seen in 1960 (Wang & Parker, 2015). When compared with White women, African American women are more likely to be single and to be single parents than are women of other races (Johnson, 2012). Additionally, African American women who are married report lower marital quality (Choi & Mark, 2013) and are more than twice as likely to divorce as their White counterparts (Besharov & West, 2001). Marital conflict has been found to be related to risky health behaviors and poor mental health (Green et al., 2013; Robbins & Martin, 1993). Further, traditional and early marriage (marriage before 26 years) appear to be associated with an increased risk of obesity among African American women (Harris, Lee, & DeLeone, 2010; Shafer, 2010).

Interestingly, education is a factor in marriage for African American women. Educational attainment is a useful proxy measure of a woman's economic independence (Goldstein & Kenny, 2001), and economic independence can contribute to positive health outcomes for a woman and her family. Those with higher education and better economic prospects are more likely to get married, to stay married, and to have children within marriage (Smock, Manning, & Porter, 2005).

Marriage compatibility is also of importance. For women, a "marriageable man" is someone who meets both educational and occupational standards (King & Allen, 2009). Given current trends, however, it seems likely that many African American women will be left wanting. According to Pew Research Center (2014), of the recent high school graduated in 2012, 69% of African American women were enrolled in college, while the percentage for African American men was only 57%. Additionally, the Journal of Blacks in Higher Education (2014) reports that 43.3% of African American women earned their degrees within six years compared to 34.2% of

African American men at publicly operated colleges and universities. For private colleges and universities, the graduation rate for Black women was 48.5% compared to a graduation rate of 39.2% for African American men (*Journal of Black in Higher Education*, 2014). This gender imbalance in rates of college education among African Americans reduces the available pool of “marriageable” men. Nitsche and Brueckner (2009) report that when African American women do marry, they are more likely than any other group to marry less-educated men; and if they have children, they are more likely to do so while still in school, with potential consequences for educational attainment and career formation. Utilizing data from the U.S. Census Bureau’s Current Population Survey, Nitsche and Brueckner found that marriage chances for highly educated (graduate school) black women have declined over time relative to their White counterparts (2009).

**Cohabitation.** Cohabitation as a precursor or an alternative to marriage has become commonplace (Smock, 2000). However African Americans are less likely to transform their cohabitation relationships into marriages than White persons (Smock, Caspe, & Wyse, 2008). For example, in a study of first cohabitation, Choi and Seltzer (2011) found that for African Americans, cohabitation is short-lived and usually ends by the couple dissolving their relationship rather than marrying. Moreover, African American women are more likely than women in other groups to separate from their first cohabiting partners, with approximately a third of African American women having separated from their first cohabiting partners within three years (Choi & Seltzer, 2011).

Cohabitation provides some economic benefits by reducing financial hardship, particularly for African American and Hispanic women (Avellar & Smock, 2005). This is important as Hispanic and African women are more likely than White women to conceive a child

while cohabiting with Hispanics twice as likely and African American women three times as likely as White women to remain cohabiting with their partner rather than pursuing marriage when the child is born (Smock et al., 2008).

The literature is not as clear on what cohabitation means for health outcomes among this African American women. However, in a study examining whether the self-reported mental and physical health of single mothers would benefit from marriage or cohabitation, Williams, Sassler, and Nicholson (2008) found that short-lived cohabiting unions are associated with increased mental distress and that entering a cohabiting relationship is not associated with improved physical health. The authors suggested that entering into unstable cohabitation relationships may be risky for single women with or without children, as the negative costs to mental health appear to outweigh any potential benefits.

**Single motherhood.** A natural consequence of low marriage rates and failed co-residential relationships is a higher prevalence of single-headed families. According to the U.S. Census (2011), 66.7% of African American women were single in 2010, compared to 44.3% of White women. According to the Child Trends Databank (2015), in 2013, 72% of all births to African American women were to single mothers. Additionally, more than 42% of single mothers with children aged 18 and younger lived in poverty in 2010, with more than 47.1% of Black single mothers living below the poverty line compared approximately to 33% of White single mothers (Broussard et al., 2012; U.S. Census Bureau, 2011). In 2013, 72% of all births to African American women occurred outside of marriage (Child Trends Databank, 2015), making understanding health outcomes related to single motherhood important for both women and children.

Single mothers of young children are especially vulnerable to depression due to chronic stressors and poverty (Hatcher et al., 2008). Being a low-income African American single mother can also create high levels of chronic stressors (Hatcher et al., 2008). These chronic and emotional stressors could be associated with, for example, inability to meet basic needs with earned income, reliance on public assistance, stigma attached to poverty, and food insecurity, as well as obesity and overweight from limited healthy food choices, which in turn contribute to hypertension and CHD. The greater the economic hardship among poor, single mothers, the higher the likelihood of poor mental health (Broussard, Joseph, & Thompson, 2012).

### **Employment and Head of Household**

With the decreased likelihood of marriage among African Americans comes an increased likelihood of households headed by poor, single African-American women. While marriage brings economic benefits, single mothers are more likely to have experienced unemployment (Turner, 2007). According to the Bureau of Labor Statistics (2015), the seasonally adjusted unemployment rate for African American women was 8.9% compared to 4.2% for White women. Once unemployed, African Americans are less likely to find jobs and tend to stay unemployed for longer periods of time (U.S. Department of Labor, 2014).

An executive summary by the National Women's Law Center (NWLC, 2014) titled *Underpaid and Overloaded: Women in Low-Wage Jobs* revealed that women dominate the low-wage workforce with jobs that include home health aides, child care workers, fast food workers, restaurant servers, maids, and cashiers. This is concerning because working mothers are the primary breadwinners in 41% of families with children (NWLC, 2014). The NWLC report also stated that nearly half of those who work low-wage jobs are women of color. Half of these women work full time and nearly one in five is poor. African American women's share of the

low-wage workforce is about 12%. The study found that in order to avoid being overrepresented in the low-wage workforce, women need a bachelor's degree while men only need a high school diploma. However, unemployment rates among African Americans are higher than those for Whites at every education level (U.S. Department of Labor, 2014). Rosenthal and colleagues (2012) found that unemployment and underemployment have adverse mental and physical health consequences, such as increased stress and depression (Rosenthal, Carroll-Scott, Earnshaw, Santill, & Ickovica, 2012). Not surprisingly, Rosenthal and colleagues also found being employed full-time was associated with lower levels of stress and depressive symptoms, more frequent healthy eating, less frequent unhealthy eating, more physical activity, less cigarette smoking, and less alcohol consumption, compared with being unemployed or working part-time (Rosenthal et al, 2012). The same study suggested that free mental health services should be provided to the underemployed and unemployed, who may be at heightened risk of stress, depression, and unhealthy coping behaviors. A review of the social role literature has shown significant stress can be attributed to various marital, parental, and employment statuses. This undercurrent of stress that is attached to social roles is explored further in Chapter 3.

## **CHAPTER 3**

### **CONCEPTUAL FRAMEWORK**

To understand the hypothesized relationship between social roles and sick role acceptance, this chapter outlines Lazarus and Folkman's (1984) transactional model of stress and coping (TMSC) and presents a conceptual framework for understanding (a) personal appraisal of the demands associated with accepting the sick role diagnosis of hypertension, and (b) the internal evaluation of resources that lead to coping behavior and ultimately health-promoting behaviors. Additionally, this chapter provides a discussion of additional stress and coping theories in the literature that have been applied specifically to explore the impact of stress on chronic illness among African Americans. Finally, the TMSC, in conjunction with role theory, is foundational in this dissertation study. Each theory informs the study conceptual model, which is presented at the end of the chapter.

#### **The Transactional Model of Stress and Coping (TMSC)**

Originally proposed by Richard Lazarus (1966) in his book *Theory of Psychological Stress and the Coping Process*, the TMSC was the first theoretical model to emphasize the important role of *cognitive appraisal* (self-evaluation in how a person reacts, feels, and behaves in encounters with the environment) and *coping* (cognitive and behavioral efforts to manage demands) as mediators of stressful person-environment interactions (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Lyon, 2011). Lazarus's views on stress were a departure

from earlier stress and coping theories which viewed stress as a response to (a) *strain* or negative or disturbing factors in the environment (Levi, 1974; Selye, 1956) or (b) a *stimulus* (Symonds, 1947; Welford, 1973), treating life events as the stressors to which an individual responds (Lyon, 2011). Instead, Lazarus viewed stress as a *transactional* process, suggesting that stress does not exist in a given situation or event (e.g., being diagnosed with high blood pressure) but rather is the result of transactions (continuous interactions and adjustments) between the person and the environment (Lazarus & Folkman, 1984; Lyon, 2011).

Effective adaptation to stressful events involves a complex relationship of several different factors including the situation or event itself, personal appraisal of the impact of that event, a review of coping resources, and ultimately the use of coping strategies. The TMSC is a cognitive framework useful for understanding how persons in their environment move through the process of evaluating and coping with a perceived stressful event. This dissertation uses Lazarus's definition of stress as "occurring when an individual perceives that the demands of an external situation are beyond his or her perceived ability to cope with them" (Lazarus, 1966, p. 9). Theoretically, stress arises when individuals perceive that they cannot adequately cope with the demands being made on them or with the immediate threats to their well-being (Lazarus, 1966; Lazarus & Folkman, 1984). Essentially there is a perception of discrepancy between the demands of a potential threat and resources available to cope with those demands (Folkman, Schaefer, & Lazarus, 1979; Lazarus, 1966). The way in which individuals interpret their ability to effectively cope with a threat can often become more important than the threat itself. How a stressor is perceived may either facilitate or impede ability to cope with the event.

This dissertation hypothesizes that women will evaluate available coping strategies for a diagnosis of hypertension based on their perception of resource availability when considering



existing roles. Further, it is hypothesized that an assessment of incongruence between a woman's current role obligations and the demands and responsibilities of the new sick role will cause stress (conflict), which will ultimately result in a failure to adhere to medical recommendations.

### TMSC Cognitive Appraisal

Individuals are constantly evaluating the significance of life events and their possible impact on our well-being. How they cope with the meaning of those events is directly related to the process of appraisal. Cognitive appraisal is the process through which individuals interpret and respond to potentially stressful events. Here, a person evaluates the importance of an interaction with the environment by asking, "What does this mean to me personally?" (Lazarus & Folkman, 1987). There are three types of appraisal central to the TMSC: primary appraisal, secondary appraisal, and reappraisal. The basic model is illustrated in Figure 3.

Figure 3. The Transactional Model of Stress and Coping



Source: Lazarus & Folkman, 1984

**Primary appraisal.** When faced with a stressor, a person considers the relevance of the potential threat. Essentially “the person evaluates whether he or she has anything at stake in this encounter” (Folkman et al., 1986, p. 993). In a primary appraisal, a person makes a judgment about whether a person-environment transaction is *irrelevant*, *benign-positive*, or *stressful*. When a transaction is appraised as irrelevant, it is seen as having no significance for personal wellbeing. An appraisal of benign-positive would result in a positive assessment of the transaction as neither taxing nor being in excess of the person’s resources. However, if the transaction is appraised as stressful, then the person has determined that the demands of the situation outweigh the available resources (Lyon, 2011).

When a transaction has been appraised as stressful, it is seen as having the potential for *harm/loss*, *threat*, or *challenge*. In *harm/loss*, actual harm has already occurred, for example having been diagnosed with hypertension by a medical professional. A *threat* here represents the potential for future harm (e.g., potential for coronary heart disease). Finally, a *challenge* represents an opportunity for gain or benefit. Harm/loss and threat appraisals are characterized by negative emotions, such as anger, fear, or resentment, whereas challenge appraisals are characterized by pleasurable emotions, such as excitement and eagerness (Folkman, 1984).

**Commitments and beliefs.** An individual’s appraisal can be influenced by *commitments*. Commitments are defined as an individual’s general belief about his or her ability to control important outcomes, revealing what is important to the individual and what has meaning for him or her (Folkman, 1984). These commitments can be thought of as personal contemplations of what is at stake when facing this new demand. For a woman faced with acceptance of the sick role, contemplations can include support of a spouse, lost wages from missed employment, or familial responsibilities. Any encounter that involves a strongly held belief or commitment will

be evaluated as significant with respect to personal well-being to the extent that the expected outcome harms or threatens that commitment (Folkman, 1984). In this dissertation research, those commitments could be considerations that include existing social roles.

**Secondary appraisal.** It is the perception of a *threat* that prompts the secondary appraisal process and initiates the evaluation of coping options. This secondary appraisal process addresses the question, “What, if anything, can I do?” or “What actions can be taken?” Coping resources would include physical (i.e., health, strength, and energy), social (i.e., social support systems), psychological (i.e., beliefs and personal faith), and material assets (i.e., financial resources; Folkman, 1984). It is important to note that the TMSC is not a theory of “stages” with appraisals occurring one after the other (Shweder, 1993). Instead the secondary appraisal happens simultaneously with the primary appraisal, and at times the secondary appraisal becomes the cause of a primary appraisal.

**Situational appraisal.** An event can also be appraised in terms of its *controllability*. Situational appraisals of control, much like commitments in primary appraisal, are a part of the secondary appraisal process. These are a person’s beliefs or judgment about the possibilities for control over the stressful encounter (Folkman, 1984). Situational appraisals are the result of the individual’s evaluation of the stress demand and the subjective evaluation of available coping resource options and ability to implement them. If individuals attribute controllability to factors external to themselves, they are less likely to believe there is efficacy in confronting the problem (Fleishman, 1984).

**Reappraisal.** Finally, “*reappraisal* is the process of continually evaluating, changing, or relabeling earlier primary or secondary appraisals as the situation evolves”. (Lyon, 2011.p 9). After a period of reappraisal, what was initially seen as a threat may now be seen as a challenge

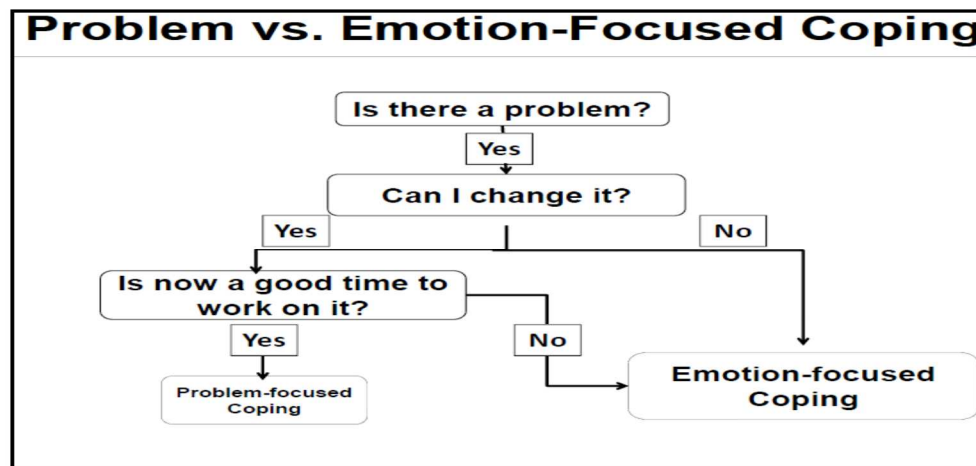
(a positive opportunity), irrelevant-benign. Ultimately, the conclusions drawn during these appraisal processes determine emotions and coping behaviors (Lyon, 2011).

### **TMSC Coping**

Coping behaviors are an important piece of the stress process. The ways people cope with stress affect their psychological, physical, and social well-being (Folkman & Lazarus, 1980). Whether strategies to cope are adaptive or maladaptive depends on the event, personal appraisal, and coping strategies. Coping is defined as the “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p. 141). It involves the management of the stressful situation, using one or more management strategies (e.g., master the situation, minimize importance, or avoid situation). Different people may employ different types of coping behaviors. The choice of coping behaviors can moderate the degree to which psychological distress results from social stress (Fleishman, 1984).

**Coping strategies.** Two forms of coping are described in the TMSC: those focused on altering the troubled person-environment relationship that is causing the distress (*problem-focused coping*), and efforts aimed at decreasing stressful emotions (*emotion-focused coping*; Folkman et al., 1986). In a study of coping with daily stressful events among a community of middle-aged men and women, Folkman and Lazarus (1980) found that problem-focused coping was used more frequently in encounters that were appraised by the person as changeable, while emotion-focused coping was used more frequently in encounters that were appraised as more unchangeable. Figure 4 presents a diagram of the internal process of the cognitive process that determines what type of coping an individual is likely to use.

Figure 4. Cognitive Process Leading to Determination of Problem vs. Emotion-Focused Coping



Source: Wells-Di Gregorio (n.d., p. 11)

### Stress, Coping, and Health Outcomes

Individuals experiencing stressful events are at risk for both physical and psychological illness (Outlaw, 1993), and when coping is inadequate, this tends to compound existing stress (Lazarus, 1990). The literature clearly illustrates that stress and coping behaviors can negatively impact individual well-being. In general, there is familiarity with the negative impacts of stress and maladaptive coping behaviors that result in, for example, alcoholism, drug addiction, and eating disorders, as well as intimate partner violence (e.g., Ayer, Harder, Rose, & Helzer, 2011; Fox, Bergquist, Hong, & Sinha, 2007; Shortt, Capaldi, Kim, & Tiberio, 2013; Sulkowski, Dempsey, & Dempsey, 2011). Additionally, research has linked stress to the onset of anxiety and depressive symptomology, which can significantly impact emotional well-being and diminish the ability to maintain healthy relationships and accomplish goals (Fan, Blumenthal, Watkins, & Sherwood, 2015).

Stress is the generic cause of, or contributor to, several diseases, but not the specific cause of any one (House, 1974). The literature has presented strong correlational evidence between stress and chronic illnesses such as stroke, hypertension, heart disease, and metabolic

syndrome (a combination of cardiovascular risk factors related to hypertension, abdominal obesity dyslipidemia, and insulin resistance). More specifically, chronic work-related stress has been shown to impact metabolic syndrome (Chandola, Brunner, & Marmot, 2006), hypertension (Vrijkotte, Van Doornen, & De Geus, 2000), and CHD (House, 1974; Marmot, Bosma, Hemingway, Brunner, & Stansfeld, 1997). Egido and colleagues (2012) found that psychophysical stress factors (i.e., quality of life, high levels of anxiety or depression, social and work status, family responsibilities, and cultural differences) are associated with stroke. Stress is a physiological demand placed on the body, which is like a threat; in response, the individual finds ways to appraise and cope with the threat (Nevid & Rathus, 2003). Prolonged stress coupled with the inability to effectively cope with demands can have undesirable consequences on health outcomes. This dissertation focuses specifically on the stress (sick role diagnosis) and the coping (evaluation of multiple roles) behaviors of African American women with hypertension.

**Stress, coping, and health outcomes in African American women.** Although not a homogeneous group, African Americans have a shared history of shouldering the burdens of racism, oppression, and discrimination. These burdens have had an impact that lingers even today, as evidenced by current health disparities. “Health disparities can stem from any combination of stressors, including economic determinants, education, geography and neighborhood, environment, lower-quality health care, inadequate access to health care, inability to navigate the health care system, provider ignorance or bias, and stress” (Bahls, 2011, p. 3). From slavery through the present, examples of persistent stressors in this population have included work and labor stress (e.g., slave labor, marginalization after emancipation, Jim Crow laws), acculturative stress (i.e., stress related to adaptation to a dominant culture), environmental stress (e.g., SES, neighborhood segregation), and perceived and actual discrimination and racism

(e.g., daily microaggressions) ( e.g. Anderson, 1991; Mims, Higginbottom & Reid, 2001; Sue, Capodilupo, & Holder). Over time, chronic stress can result in both physical and behavioral consequences and can result in cumulative disadvantages (Braveman, 2011).

Prior research has examined the theoretical relationships between racism, stress, and coping on health outcomes specific to African Americans in general and African American women and high blood pressure in particular. The following sections briefly review findings from that body of literature.

### **Racism and Health**

Racism is a chronic stressor, and chronic psychosocial stress has long been hypothesized to be a risk factor for hypertension (Brondolo, Love, Pencille, Schoenthaler, & Ogedegbe, 2011; Subramanyam et al., 2013). Although race is a social construct, the use of racial categories to divide and discriminate against groups of individuals is tangible. Importantly, these racial categories predict variations in health status (Williams, 1997). For example, stress due to experiences with racism has been shown to impact birth outcomes for African American women (Nuru-Jeter et al., 2009). However, evidence of a relationship between racial discrimination and blood pressure has been inconsistent across studies (Barksdale, Farrug, & Harkness, 2009; Brondolo et al., 2011). To unpack the relationship between racism and health, several studies have examined the physiological impact of racism on health outcomes (Paradies, 2006; Pascoe & Smart Richman, 2009; Williams & Mohammad, 2009). Several examples of that literature follow.

**Racism and high blood pressure.** Specific to hypertension, Krieger and Sidney (1996) assessed the relationship between self-reported experiences of racial discrimination and blood pressure among participants enrolled in the CARDIA study (Coronary Artery Risk Development

in Young Adults), a study that examined the evolution of cardiovascular risk factors. Participants were asked about experiences of racial discrimination and unfair treatment in several settings (i.e., at school, getting a job, at work, getting housing, getting medical care, on the street or in a public setting, and from the police or in the courts). African American women reported they were most likely to experience discrimination on the street or in public settings, followed closely by at work. The researchers also evaluated blood pressure by two social classes (i.e. working class or executive/professional/supervisory). Their results indicated higher blood pressure among working class African American women who reported keeping discrimination to themselves compared to those who told others and tried to do something about it (Kreiger & Sidney, 1996). Additionally, lower blood pressures were found among professional African American women who reported that they typically challenge unfair treatment and had not experienced discrimination.

Williams and Neighbors (2001) reviewed the scientific evidence related to high blood pressure and racism, examining studies conducted in laboratory environments as well as epidemiological studies with community samples. In one example of the reviewed literature, Fang and Myer's (2001) laboratory study of African American and White men found that there was increased cardiovascular reactivity among both groups when exposed to racially charged material (a filmed portrayal of racism)—but the increase was no more than that produced by any other anger-provoking stressors (Williams & Neighbors, 2001). Although there was no difference by race, the authors stated that because African Americans have higher exposure to racial stress and non-racial stress, they may carry a heavier burden in terms of cardiovascular reactivity and thus, an increased burden of cardiovascular disease (Fang & Myers, 2001; Williams & Neighbors, 2001). The review also included laboratory research by Clark (2000),



who found that in a small sample of African American women ( $N = 39$ ), women who scored highly on a perceived racism scale had higher diastolic blood pressure.

Other studies found less evidence of a link between racism and high blood pressure. For example, Peters (2004) examined the impact of exposure to a chronic stressor (perceived racism) on the development of chronic stress emotions (trait anger, trait anxiety, and trait depression) and hypertension among African Americans adults. The study found that while participants had high levels of perceived racism, it was not however associated with blood pressure. Interestingly, the highest levels of blood pressure were found in older adults who had reported the lowest level of perceived racism. The author suggested some relationship to the idea of *internalized oppression* whereby unfair treatment is perceived as “deserved” and not discriminatory (Peters, 2004). Similarly, Barksdale, Farrug, and Harkness (2009) found that although racial discrimination was not correlated with blood pressure, surprisingly, emotions like sadness and frustration were significantly but negatively correlated with blood pressure.

Racism can occur on multiple levels: individual (i.e., targeted person to person), interpersonal (i.e., directly perceived discriminatory interactions between individuals in their institutional roles or as public or private individuals), internalized (i.e., accepting what others believe), and institutional (i.e., policies and procedures in resulting unequal treatment; Brondolo et al., 2011). In a review of the empirical evidence directly and indirectly linking multiple levels of racism to hypertension, Brondolo and colleagues found that while there was evidence that racism appears to affect risk for high blood pressure, the effects are complex (Brondolo et al., 2011). Specifically, while high blood pressure may increase as a result of institutional racism and interpersonal racism, direct evidence linking individual racism and interpersonal racism to high blood pressure diagnosis in this study was weak.

What is clear from the literature is that how a person copes with the stress of racism and oppression impacts health outcomes in ways that are not always easy to measure. Several frameworks and hypotheses on stress and coping behaviors specific to African Americans are proposed in the literature. A brief summary of those theories follows.

### **Explanatory Theories of Stress and Coping Specific to African Americans**

Several researchers with interests in the impact of stress on the African American population have proposed culturally specific hypotheses describing the pathways between chronic stress and coping mechanisms. This section briefly reviews four of these related frameworks.

**Weathering hypothesis.** The weathering hypothesis posits that African Americans experience health deterioration earlier in life as a consequence of the cumulative impact of repetitive social and economic adversity, as well as political marginalization (Geronimus, 1991; Geronimus, Hicken, Keene, & Bound, 2006). This accumulation of disadvantage over the life course may also contribute to acceleration of the biological aging process (Geronimus et al., 2006; Levine & Crimmins, 2014; Whitfield, Thorpe, & Szanton, 2011). As a result African Americans experience earlier disease mortality and morbidity. The weathering hypothesis has been utilized to explain early-age of onset of diseases normally seen in older age (Geronimus et al., 2006) including high blood pressure (Geronimus, Bound, Keene, & Hicken, 2007).

**Allostatic load.** The allostatic load framework is sometimes referred to as the mechanism for weathering (Whitfield, Thorpe, & Szanton, 2011). *Allostasis* is the process by which the body adapts to a stressor in order to maintain homeostasis (the internal processes of the body that regulate its response to challenges and demands; Mays, Cochran, & Barnes, 2007). *Allostatic load* speaks to the cumulative biological burden (wear and tear) experienced by a person as a

result of daily adaptation to physical and emotional stress. “Allostatic systems enable us to respond to our physical states (e.g., awake, asleep, supine, standing, exercising) and to cope with noise, crowding, isolation, hunger, extremes of temperature, danger, and microbial or parasitic infection” (McEwen, 1998, p. 172). When the stress to the “cardiovascular system is prolonged and excessive to the point of allostasis (process of body achieving stability), immunity is suppressed, blood pressure increases, and over time, atherosclerosis can develop resulting in coronary vascular disease” (McEwen, 2002, p. 9). African American women show the most consistently elevated levels of allostatic load across age and racial and ethnic groups (Juster, McEwen, & Lupien, 2010).

**John Henryism.** The concept of “John Henryism” is a cultural statement about how African Americans often attempt to control behavioral stressors through hard work and determination (James, Hartnett, & Kalsbeek, 1983). John Henry, the “Steel Driving Man,” is a legendary figure in African American folklore who was paired in a contest of speed with a steam-powered drill. Using two 20-pound hammers, John Henry was able to beat the steam drill; however, it would cost him his life. The hypothesis argues that prolonged, high-effort coping with chronic psychosocial stressors may be associated with elevated risk for negative health outcomes among those without sufficient socioeconomic resources (Bennett et al., 2004). John Henryism has been recognized as a style of strong coping behaviors used to deal with psychosocial and environmental stressors such as career issues, health problems, and even racism (Duke Medicine News and Communications, 2006). Persons who exhibit traits of John Henryism are highly goal-oriented and extremely preoccupied with success (Duke Medicine News and Communications, 2006). Perhaps not surprisingly, John Henryism has been linked to high blood

pressure (James, 1994; James et al., 1983; James, LaCroix, Kleinbaum, & Strogatz, 1984), depression (Hudson, Neighbors, Geronimus, & Jackson, 2015), and stroke (Benn et al., 2014).

**Sojourner syndrome.** Sojourner syndrome (Mullings, 2000) is a gendered form of John Henryism that presents a message of intersecting and overlapping gendered responsibilities among African American women (Mullings, 2000; Mullings & Wali, 2001). Sojourner syndrome offers an interpretive framework to explain the early onset of disease mortality and morbidity among African American women as a response to chronic stress and the active coping associated with having multiple social identities and caregiving roles (Lekan, 2009; Mullings, 2000). Born into slavery in the late 1790s and liberated by the New York State Emancipation Act in 1827, Sojourner Truth was a traveling abolitionist preacher and early champion of the women's rights movement. She is best known for her infamous "Ain't I a Woman?" speech characterizing the roles of African American women juxtaposed against the privileged womanhood of White women in a society governed by racial and gender oppression. Her famous 1851 speech at the Women's Rights Convention in Akron, Ohio, illustrates the contrast.

But what's all this talking about? That man over there says that women need to be helped into carriages, and lifted over ditches, and to have the best place everywhere. Nobody helps me any best place. And ain't I a woman? Look at me! Look at my arm. I have plowed (sic), I have planted and I have gathered into barns. And no man could head me. And ain't I a woman? I could work as much, and eat as much as any man—when I could get it—and bear the lash as well! And ain't I a woman? (cited in Brah & Phoenix, 2004, p. 77)

Issues related to both gender and race influence the stress experiences of African American women (Giscombé & Lobel, 2005). As slaves, African Americans were not allowed to marry. The Sojourner Truth speech speaks to the familial and social roles required as a result of the absence of fathers and husbands and the stress of the economic and social responsibility to maintain family cohesion (Lekan, 2009). Some of these same stressors impact African American

women today. Similarly, the stress and coping theory *Superwoman Schema* asserts that during and after emancipation, African American women were forced to take on certain social roles (e.g., mother, nurturer, breadwinner) out of social and economic necessity, thus becoming a Superwoman just to survive (Woods-Giscombé & Black, 2010). It is this role conflict that this dissertation asserts has an impact on health choices, specifically sick role acceptance.

### **Conceptual Model Components**

The process of social stress can be seen as combining three major conceptual domains: the sources of stress (e.g., diagnosis of sickness), the mediators of stress (e.g., multiple social roles), and the manifestations of stress (e.g., sick role rejection; Pearlin, Lieberman, Menaghan, & Mulan, 1981). A conceptual model of sick role acceptance among African American women utilizing the transactional model of stress and coping is presented in Figure 5. The model suggests that sick role diagnosis is the stressful event catalyst. Decisions to take on the obligations of a new role are dependent on the individual's appraisals of the stress event and his or her assessment of coping resources to meet stress demands. These stress demands made between the person and the environment upset balance, thus affecting physical and psychological well-being and requiring action to restore balance (Lazarus & Cohen, 1977). Importantly, for this population, "racism" is presented as influential on the entire model as evidenced by the literature of the stress and coping and African American women. The model's components further are explained below.

**Illness behavior and sick role diagnosis.** The model begins at illness behavior ( and for those who are asymptomatic, health behavior), which can be described as the dynamic process in which individuals monitor their bodies, perceive and evaluate symptoms, decide whether to take remedial action, and utilize various sources of help (Chrisman, 1977; Mechanic, 1986; Mechanic

& Volkart, 1961). Individuals move from illness behavior to sick role behavior when symptoms persist and become severe enough to be confirmed or affirmed by a medical professional.

However this affirmation by a doctor does not guarantee acceptance of this new role. In this study, confirmation of hypertension by a medical professional indicates confirmation but not acceptance of the role.

**Primary appraisal.** Upon diagnosis, the person would begin a process of determining the meaning of this diagnosis and personal relevance. There can be a determination that this new diagnosis is *irrelevant* and does not impact well-being. Here an individual determines they have nothing to gain or lose from the diagnosis. For example, a temporary diagnosis of high blood pressure caused by “White Coat Syndrome” and a subsequent return to normal blood pressure range at the end of the session (fear from doctor’s white coat alleviated) would render a diagnosis irrelevant for the individual. Alternately, the diagnosis could be seen as *benign-positive*, which is the determination that the likely outcome is perceived as a positive and in some way helpful. Finally there can be a determination that the diagnosis of sickness is *stressful*. When a transaction has been appraised as stressful, a person makes additional judgments about its meaning. Specifically these judgments include harm, threat, and challenge. *Harm* refers to damage that has already happened (i.e., medical diagnosis of hypertension), while *threat* is the fear of future or imminent harm (e.g., potential for coronary heart disease). *Challenge* refers to the confidence that one feels about being able to successfully meet the requirements of the demands. The model also notes the influence of personal beliefs and commitments. Remember that the TMSC is not a stage theory; instead, these appraisals happen simultaneously. Commitments represent the beginning process of considering personal obligations like social

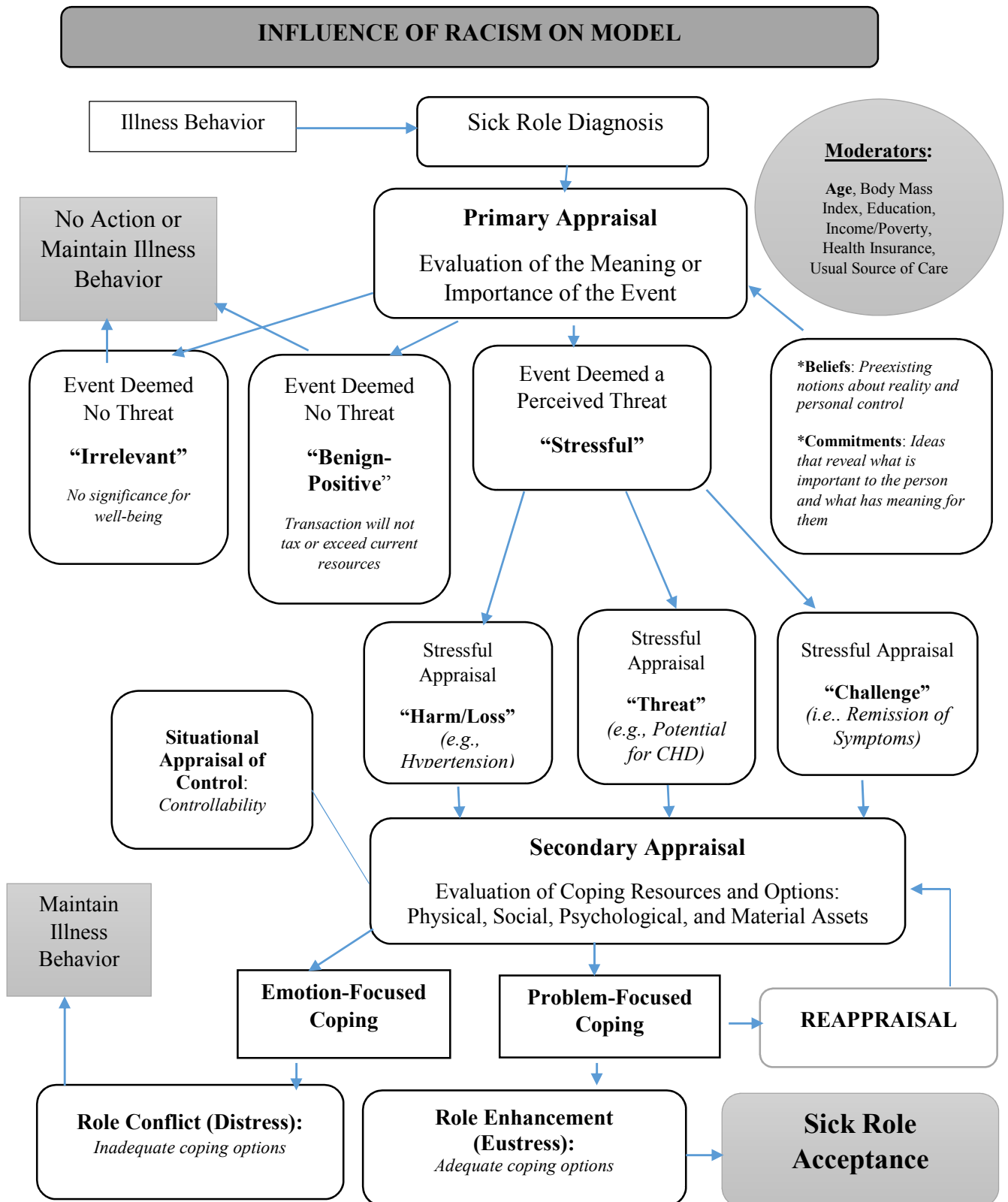
roles. These commitments can be thought of personal contemplations of what is at stake as when facing this new demand.

**Secondary appraisal.** In addition to the stakes that an individual has in an encounter, evaluative judgments are required about whether any action can be taken to improve the situation and which coping options may be useful (Lazarus & Folkman, 1987). This coping process is called secondary appraisal. Coping arises from an appraisal of harm, threat, or challenge. The secondary appraisal is supplemental to the primary appraisal as an evaluation of how much control the person has over the outcome of efforts.

**Coping.** Coping thoughts and actions depend on secondary appraisal (i.e., whether or not anything can be done about the current stressful situation). “People who have a favorable sense of their ability to meet problems and overcome them are less likely than others to appraise encounters as threatening, more likely to experience challenge rather than threat, and more likely to use effective strategies of coping” (Lazarus & Folkman, 1987, p. 148).

Coping in the model falls into two main categories: emotion-focused and problem-focused coping. In *emotion-focused coping*, efforts are directed toward decreasing or managing emotional distress. Emotion-focused coping efforts may result in distancing, minimizing, or avoiding the problem (Lyon, 2011). The model posits that emotion-focused coping leads to an evaluation of lack of resources, resulting in role conflict. To review, *role conflict* occurs when people are confronted with incompatible role expectations in the various social statuses they occupy. Conceptually, the conflict between the demands of a woman’s existing social role

Figure 5. Person-in-Environment Conceptual Model of the Pathway to Sick Role Acceptance





obligations and the exigencies of her new role as a sick individual could cause role conflict. When individuals have conflicting role obligations, the resulting strain could lead to the rejection of the new sick role and its responsibilities (e.g., medical adherence). Failure to resolve the conflict and accept the new role could cause the individual to remain in the illness behavior stage and could result in underutilization of services, treatment delay, and overuse of the emergency room. Conversely, if individuals believe that they have the necessary coping resources, the stressor will not overwhelm them and may instead be perceived as *eustress*. Eustress is a healthy or positive form of stress where the demand and the available resources of the affected person are equivalent (Wilhelm, 2008). In *problem-focused coping*, there are efforts to “define the problem, generate alternative solutions, weigh the costs and benefits of various actions, take actions to change what is changeable, and, if necessary, learn new skills” (Lyon, 2011, p. 10). The model suggests that these coping strategies lead to the acceptance of the sick role. Essentially a woman would evaluate her resources related to her current social roles and view them as helpful resources in addressing her high blood pressure diagnosis. The positive impact of a social role is called *role enhancement*. A role enhancement perspective suggests that women with more social roles that connect them to resource and social capital (i.e., positive-resourced women) should experience higher levels of emotional health as compared to those with fewer social roles (Moen, Robinson, & Dempster-McClain, 1995).

**Reappraisal.** In *reappraisal*, an individual is continually evaluating and re-evaluating strategies to cope with a situation in light of new information. The new information may relieve stress or increase the stress burden. What was initially perceived as threatening may now be viewed as a challenge (a positive opportunity) or as benign-positive or irrelevant (Lyon, 2011).

## **Sick Role Acceptance**

The model suggests that a woman faced with the sick role diagnosis, as she moves through the cognitive appraisal process, will make evaluations that include an evaluation of coping ability based on current social roles, before accepting the new sick role. Further, the model posits that sick role acceptance (as evidenced by compliance with medical recommendations) occurs when a woman's existing roles create positive stress. Conversely, rejection of the sick role would occur once the woman perceived this new role as an added burden to existing roles or that those roles do not provide enough social capital or resources to meet the new requirements.

This dissertation seeks to examine the relationship that African American women's existing social roles (i.e., marital status, employment status, and parental status) play in their sick role acceptance behaviors (i.e., adherence to medical recommendations for high blood pressure). This dissertation utilizes role theory in addition to stress and coping theories, to create a conceptual framework to guide the analysis. The following chapter presents a measurement model to test the relationship between existing social roles and sick role acceptance utilizing variables from a national public use dataset. Further, it details the steps performed in analyzing this data to answer the study questions.

## **CHAPTER 4**

### **METHODOLOGY**

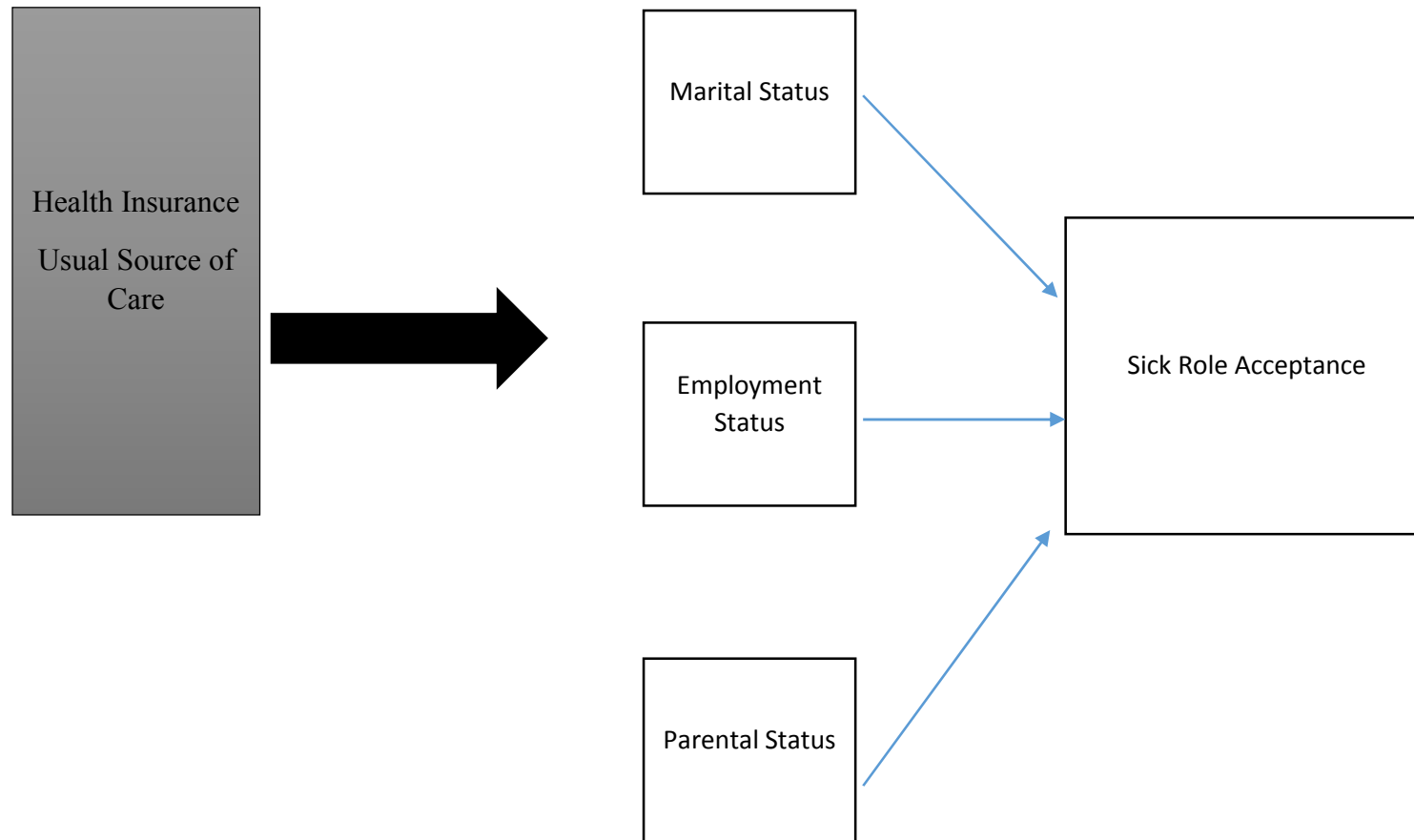
This chapter presents the dissertation's measurement model illustrating the direct effects and interactions of the variables of interest. The remainder of the chapter provides a description of the data source, study variables, and statistical procedures used to analyze the data and answer the four research questions:

1. Is sick role acceptance a function of African American women's status role?
  - a. marital status
  - b. employment status
  - c. parental status
2. What are the cumulative effects of having multiple social roles on sick role acceptance?
3. Does having health insurance moderate the relationship between social roles (i.e., marital status, employment status, and parental status) and sick role acceptance?
4. Does having a usual source of care moderate the relationship between social roles (i.e., marital status, employment status, and parental status) and sick role acceptance?

#### **Measurement Model**

The basic model tested in this study is presented in diagrammatic form in Figure 6. It examines the relationship of the study's three independent variables (marital status, employment status, and parental status) and their hypothesized influences on sick role acceptance,

Figure 6. Measurement Model of Hypothesized Relationships between Existing Social Roles and Sick Role Acceptance with Moderating Variables



measured as adherence to medical recommendations for hypertension. Specifically, the model suggests that each individual role status has a direct effect on sick role acceptance as well as a combined effect. The strength and form of a relationship between two variables may depend on the value of a moderating variable (MacKinnon, 2011). As such, this research examines several moderator variables (with specific interest in having a usual source of care and health insurance) that may modify the strength of the relationships between the independent variables and the outcome variables.

### **Data Source**

For this dissertation, secondary data analysis was performed with variables extracted from the National Health and Nutrition Examination Survey (NHANES) years 2011 and 2012 (CDC, 2013). This nationally representative survey is a cross-sectional, complex, stratified multistage probability sample of the United States non-institutionalized population. NHANES is designed to assess the health and nutritional status of adults and children in the United States by uniquely combining data from interviews, questionnaires and physical examinations. Health interviews are conducted in respondents' homes. Health measurements or physical examinations are performed in specially-designed and equipped mobile centers, which travel to locations throughout the country. NHANES data are de-identified public-use data, and the use of these data is not considered human subjects research. Each sampled person in NHANES is assigned a numerical sample weight that measures the number of people in the population represented by that specific person. Sample weights for NHANES participants incorporate adjustments for unequal selection probabilities and certain types of non-response, as well as an adjustment to independent estimates (called control totals) of population sizes for specific age, sex, and race/ethnicity categories. These adjustments are made at the aggregate level for an NHANES

sample, so that estimates computed from that sample are nationally representative. Because not all sampled persons completed all portions of the survey, each individual represented in a public release data file may have several different sample weights assigned, depending on the nature of the non-response adjustments required (CDC, 2011). These weighting procedures allow for extrapolation from sample to the population/

The NHANES data are available directly to the public from the Centers for Disease Control website including questionnaires, datasets, and related documentation for all years that surveys were collected. The 2011-2012 NHANES dataset contained the following data files that were merged to create a new data set with the variables of interest for analysis: Demographic Data, Examination Data, and Questionnaire Data. From the Demographic Data file (code/variable names are in parenthesis), extracted variables included age (RIDAGEYR), race (RIDETH1), gender (RIAGENDR), marital status (DMDMARTL), education (DMDEDUC2), ratio of family income to poverty (INDFMPIR), parental status measured by number of children in the household age 5 years or younger (DMDHHSZA) and number of children age 6-17 years (DMDHHSZB). From the Examination Data, extracted variables included systolic blood pressure (BPXSY1) and diastolic blood pressure (BPXDI1), and body mass index (BMXBMI). From the Questionnaire Data, extracted variables included answers to the questions: “Have you ever been told by a doctor or other health professional that you had hypertension, also called high blood pressure?” (BPQ020); “Because of your high blood pressure/hypertension, have you ever been told to take prescribed medicine?” (BPQ040A); “Are you now taking prescribed medicine [for high blood pressure]?” (BPQ050A); “To lower your risk for certain diseases, during the past 12 months, have you ever been told by a doctor or health professional to increase your physical activity or exercise?” (MCQ365B); “To lower your risk for certain diseases, are

you now doing any of the following: increasing your physical activity or exercise?”

(MCQ370B); “To lower your risk for certain diseases, during the past 12 months, have you been ever been told by a doctor or health professional to reduce the amount of sodium or salt in your diet?” (MCQ365C); “To lower your risk for certain diseases, are you now doing any of the following: reducing the amount of sodium or salt in your diet?” (MCQ370C); “Are you covered by health insurance or some other kind of health care plan?” (HIQ011); “Is there a place that you usually go when you are sick or need advice about your health?” (HUQ030); “What kind of place do you go to most often: is it a clinic, doctor’s office, emergency room, or some other place?” (HUQ040).

Employment status information was also extracted from the Questionnaire Data. Specifically, variable OCQ180 was used to determine number of hours typically worked per week. Employment status for those who usually worked 35 hours per week or more was labeled full time; those who usually worked less than 35 hours per week were labeled part time. Unemployment was determined by response to variable OCQ380, which asked the main reason why the respondent did not work during the last week.

### **Study Sample**

The target population for the study was African American women age 20 years and older who had been told by a doctor that they had high blood pressure (sick role category requirement). Survey participants were allowed to self-identify as being more than one race; however, only women who identified as single-race African American were included in the sample; persons who identified as multiracial were excluded from analysis. Further, the sample was limited to women who had medical confirmation of sickness (high blood pressure) and thus were sick role labeled. To be included in the sample, survey participants must have answered

“Yes” to the following question: “Have you ever been told by a doctor or other health professional that you had hypertension, also called high blood pressure?” These exclusion and inclusion criteria yielded a sample size of  $N = 1476$ .

### **Outcome Variable**

In this study the key outcome variable of interest was sick role acceptance—specifically, acceptance of the CHD risk factor high blood pressure diagnosis as evidenced by adherence to doctor’s or other health care professionals’ treatment recommendations. Women were asked if they had ever been told by a doctor or other health professional to perform the following tasks: (a) take medication for high blood pressure, (b) reduce salt intake, or (c) exercise. Further, women were asked if they were currently doing these activities. Women’s responses were examined for levels of medical adherence. Categories of reported adherence included medication adherence only, medication and salt reduction adherence, medication and exercise adherence, exercise and salt reduction adherence, or adherence to all medical recommendations for high blood pressure.

While the literature is not clear about what constitutes complete medical adherence, what is clear is that “optimal antihypertensive treatment requires a comprehensive approach that encompasses multifactorial lifestyle modifications (weight loss, salt and alcohol restriction, and increased physical activity) plus drug therapy” (Flack, Nasser, & Levy, 2011, p. 84). As such, the sick role was considered to be rejected if the participant reported adhering to only one of the three treatment recommendations (i.e., medication only, salt reduction only, or exercise only). Sick role acceptance was defined for this study as a self-report of adherence to at least two of the treatment recommendations. Therefore, a three-level acceptance variable (i.e., acceptance of sick role) was created to make comparisons among (a) those participants who reported adhering to



one recommendation, (b) those who reported adhering to two recommendations, and (c) those who reported adhering to all three treatment recommendations.

### **Independent Variables**

In this study the key social roles of interest are marital status, employment status, and parental status. A detailed explanation of these NHANES variables follows.

**Marital status.** Participants self-reported their current marital status as married, widowed, divorced, separated, never married (single), or living with a partner (cohabiting). For analysis, those who reported cohabitation or currently married were combined. Additionally, separated and divorced were combined into one category while those who reported that they were widowed or never married (single) were analyzed separately.

**Employment status.** Data from the occupation section of the NHANES questionnaire were used to categorize participants into employment status groups. To determine if the women were employed full time, part time, or unemployed, standards from the U.S. Bureau of Labor Statistics definitions were utilized. A woman was considered employed full time if she reported working 35 or more hours per week; she was considered employed part time if she reported working less than 35 hours per week. Women who stated they were “looking for work” or “not working at a job or business” were considered unemployed.

**Parental status.** To determine parental status for this study, women were asked the number of children living in their household. This question was divided into two parts, the first of which was the number of children living in the household age 5 years or younger. The values for this variable range from 0 to 3. Due to concerns of disclosure (i.e., ability to identify a respondent as the number of children in the home increased), households comprised of 3 or more children age 5 years or younger are included in the category “3 or more.” The second question

regarding number of children living in the household was number of children age 6-17 years old. The values for this variable range from 0 to 4. Due to disclosure concerns, households comprised of 4 or more children aged 6-17 years are included in the category “4 or more.” A second binary variable labeled “Kids” was created to compare those with children in the home compared to those without.

### **Moderating Variables**

**Health insurance.** To determine health insurance status, participants were asked if they were currently covered by health insurance or a health care plan that includes health insurance obtained through employment or purchased directly as well as government health insurance programs such as Medicare and Medicaid.

**Usual source of care.** To determine a woman’s usual source of care, participants were asked if there was a place that they usually went when sick or needed advice about their health. Those answering “Yes” were asked to specify the place (e.g., hospital/emergency department, clinic, or doctor’s office).

### **Additional Variables of Interest**

Several variables served to describe the sample but were not analyzed in the study regression models. These include: body mass index (BMI), education, age group, income to poverty ratio, and current blood pressure status established through physical examination.

**Body mass index (BMI).** BMI refers to an individual’s weight in kilograms divided by the square of their height in meters. As a proxy measure of an individual’s body fat, the BMI has demonstrated strong correlation to disease outcomes related to overweight and obesity including heart disease and high blood pressure. This dissertation study uses National Heart and Lung Institute’s (n.d.) reference categories to define BMI classifications as underweight, normal

weight, overweight, and obese. Women with a BMI at or above 30 were labeled obese. Women with a BMI in the range of 25-29.9 were labeled overweight. Women with a BMI in the range of 18.5-24.9 were labeled normal weight. Finally, women with a BMI under 18.5 were considered underweight.

**Education.** Participants who self-reported education level at 11th grade or below were labeled “No high school diploma.” The other categories included “High school graduate,” “Some college or associate’s degree,” and “College graduate or above.”

**Age group.** To document the age groups represented in the sample, groups were examined in the following clusters of age in years: 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, and above 80 years.

**Moderate physical activity.** To determine if the women were participating in moderate physical activity, American Heart Association guidelines were used to analyze whether participants self-reported at least 30 minutes of moderate-intensity aerobic activity at least 5 days per week for a total of 150 hours.

**Income to poverty ratio.** The income to poverty ratio variable was included to gain a better understanding of the financial security of the study population beyond employment status and number of hours worked. The NHANES uses the Department of Health and Human Services (HHS) poverty guidelines as the poverty measure to calculate this ratio. Ratios below 1.00 indicate that the income for the women in the study sample is below the official poverty threshold, while a ratio of 1.00 or greater indicates income above the poverty level. A ratio of 1.00, for example, indicates income that is at 100% of the poverty threshold. For this dissertation study, poverty was categorized as follows: incomes below 130% of the poverty level (i.e., income to poverty ratio of less than 1.3) were labeled low income; incomes at 130% to 350% of

the poverty level (i.e., ratio of 1.3 to 3.5) were labeled middle income; and incomes above 350% of the poverty level (i.e., ratio greater than 3.5) were labeled high income. These labels have been used in similar studies (e.g., Ostchega, Berman, Hughes, Chen, & Chiappa, 2013).

### **Data Analysis**

In order to achieve the study objectives, data files in the NHANES dataset containing variables related to high blood pressure, dietary habits, physical activity, marital status, employment status, parental status, insurance, and usual source of care were downloaded from the NHANES section of the CDC website; these data, as well as accompanying codebooks, are publicly available for download at <http://www.cdc.gov/nchs/nhanes.htm>. All data files were merged based on individual subject's ID number (SEQN), and appropriate variables were dichotomized for analysis purposes. In order to create a file for analysis, variables from the 2011-2012 NHANES data files were combined. To examine the relationship among study variables, a cross-sectional, non-experimental design was utilized. Statistical analysis was performed using SAS 9.4 software (SAS Institute, Cary, NC). The most important considerations in analyzing NHANES data involved taking into account the survey design. The survey uses a complex, stratified, multistage probability cluster sampling design; therefore, analyzing data requires software such as SAS 9.4 that accounts for such a complex design (Gossett, Simpson, Parker, & Simon, 2002).

To make valid statistical inferences, the survey design was accounted for with SAS procedures. Specifically, this research used statistical coding in SAS to develop appropriate logistic (or logit—the natural logarithm of an odds ratio) regression models. A special class of basic linear regression, logistic regression allows for examination of the effect of a single independent variable on a single outcome and estimates the probability of an outcome. The

logistic regression models are appropriate when the dependent variable of interest is binary (e.g. yes or no, 0 or 1), unlike the basic regression model which places no restrictions on the values that the independent and dependent variables take on (Williams, 2015). Further, logistic regression does not share key assumptions present in ordinary least squares regression (OLS) including (a) linearity (i.e., the linear regression model is based on an assumption that the outcome variable is continuous and linear with the independent variable; the binary outcome of the logistic violates that; however, a log linear transformation is a nonlinear transformation used to achieve linearity between two variables); (b) homoscedasticity (i.e., the variance of the dependent variable is constant across values of the independent variable); and (c) normal distribution of the errors (or the no normality assumption; Allison, 2012; Williams, 2015).

Multiple logistic regression was appropriate for this dissertation analysis as there are several dichotomous (binary) outcome variables in the study model as well as multiple categorical independent variables (i.e. marital status, employment status, and parental status). The dependent variables, all binary, include: taking medication or not, exercising or not, reducing salt or not, and adhering to all three medical recommendations or not. The goal of a multiple logistic regression is to find an equation that best predicts the probability of a value of the *dependent* variable as a function of the *independent* variables (McDonald, 2015). A multiple logistic regression model was used to fit the NHANES data to explain the predicted odds of African American women's acceptance of the sick role controlling for the other variables of interest.

In the logistic regression, the outcome in analysis is often coded as 0 or 1 where the outcome(s) of interest is coded as 0 (did not occur) or 1 (did occur). The basic linear probability model equation that represents the multiple logistic regression for this study is as follows:

$$\hat{p} = \frac{\exp(b_0 + b_1X_1 + b_2X_2 + \dots + b_pX_p)}{1 + \exp(b_0 + b_1X_1 + b_2X_2 + \dots + b_pX_p)}$$

Here the  $p$  is defined as the probability that the outcome is 1 or the occurrence. Additionally, the  $X_1$  through  $X_p$  represent the independent variables in the study and  $b_0$  through  $b_p$  are the regression coefficients. The problem with this linear probability model is that the probabilities are bounded by 0 and 1, whereas linear functions are inherently unbounded (Allison, 2012, p. 17). As such, probability can be transformed to odds, written as the log odds. Unlike a probability, the boundaries are 0 to  $\infty$ , where the outcome is the expected log of the odds that the outcome is present (i.e., taking medication, reducing salt, or exercising, with each represented in its own equation). The limited range of probability would present problems if used directly in a regression, therefore the *log odds* is used instead. The multiple logistic regression model writes the outcome as the expected log of the odds that the outcome is present.

$$\ln\left(\frac{\hat{p}}{(1-\hat{p})}\right) = b_0 + b_1X_1 + b_2X_2 + \dots + b_pX_p$$

The right side of the equation looks similar to a multiple regression model, except here “the coefficients derived from the model (e.g.,  $b_1, b_2$ ) indicate the change in the expected log odds relative to a one-unit change in  $X_1$ , holding all other predictors constant” (Sullivan, 2011 p. 211). In this study, each dependent variable was analyzed in its own equation with each of the three independent variables. The relationships of the three predictor variables to African American women’s health outcomes are hypothesized from previous research and relevant theory. Correlation and association statistics were used to confirm the relationships observed in previous research and to examine the linear relationships between variables. The basic study equations are as follows:

$$\text{Logit (pMeds)} = \beta_0 + \beta_1(\text{marital}) + \beta_2(\text{parental}) + \beta_3(\text{employment})$$

$$\text{Logit (pSalt)} = \beta_0 + \beta_1(\text{marital}) + \beta_2(\text{parental}) + \beta_3(\text{employment})$$

$$\text{Logit (pExercise)} = \beta_0 + \beta_1(\text{marital}) + \beta_2(\text{parental}) + \beta_3(\text{employment})$$

$$\text{Logit (pAccept)} = \beta_0 + \beta_1(\text{marital}) + \beta_2(\text{parental}) + \beta_3(\text{employment})$$

**Multiple logistic regression in SAS.** The SURVEYFREQ (frequencies and cross tabulation), SURVEYREG (hypothesis tests for the model effects), and SURVEYLOGISTIC procedures were used to provide statistical analyses for sample survey data. “PROC SURVEYLOGISTIC fits linear logistic regression models for discrete response survey data by maximum likelihood methods and incorporates the sample design into the analysis” (SAS Institute, 2008, p. 264). This procedure enables the user to specify categorical classification variables as explanatory variables in the model (SAS Institute, 2008).

### **Missing Data**

Frequently the survey data utilized in secondary data analysis can produce missing values due to several reasons both known and unknown. Common reasons for missing data include survey structure, refusal to answer, insufficient knowledge or memory recall, and attrition in follow up due to death or loss of contact (Berglund, 2010). This “missingness” can impact the ability to make valid statistical inferences.

There are three types of missing data: missing at random (MAR), missing completely at random (MCAR), and not missing at random (NMAR). MAR means that missing data is dependent on, or has some correlation with, some other variable in the data. For example, suppose a study was interested in the impact of employment on blood pressure medication efficacy. However, being unemployed is related to the ability to afford medication. The inability to afford medication could result in missing response data on survey questions about how

effective that medication was on reducing blood pressure (i.e., because the respondents were unable to take medication regularly). MCAR, however, is much like a flip of the coin where the missingness has nothing to do with the data or any of its variables. For example, if a study participant moves out of the study area during the study, then missing values are considered MCAR if the reason for that move is unrelated to other variables in the data set (e.g., income/poverty, unemployment, or other study-related variables). Finally, NMAR is used to describe missingness that depends on both observed and non-observed variables (e.g., attrition among the morbidly obese in a study due to hospitalization or death; Berglund, 2010).

**Addressing missing data.** “Using an appropriate method to handle cases with missing data when performing secondary analyses of survey data is important to reduce bias and to reach valid conclusions for the target population” (Langkamp, Lehman, & Lemeshow, 2010, p.1). To determine whether remedial measures were needed to address possible missing values among the variables of interest, SAS procedures (i.e., PROC MEANS and NMISS) were utilized to examine all study variables. As a general rule, if 10% or less of the data for a variable are missing from the analytic set, it is usually acceptable to continue the analysis without further evaluation or adjustment (CDC, n.d.). Table 1 lists the number of missing for each dependent, independent variable and covariates.

After examination of all variables, it was determined that those variables that served only as demographic or descriptive of the sample would not be adjusted for missing values. For the independent variables used in the analysis (i.e., Kids, Mrtlstatus, and Employvar), none had missing values above the 10% threshold and thus did not need adjustment. However, several of the dependent variables had a significant number of missing values above the 10% threshold (i.e., Exercise, Salt, and Accept). Allison (2012) stated that among conventional methods for



handling missing data, listwise deletion is the least problematic. SAS procedures handle the deletion of these missing values automatically with no need for the researcher to create an additional dataset that contains all of the complete cases.

Table 1

*Number of Missing Data*

Variable Name	Label	Number Missing (%)
Meds	Currently Taking Medication	37
Exercise	Currently Exercising	415
Salt	Currently Reducing Salt	379
Accept	Levels of Adherence	617
Kids	Children in Home	0
Mrtlstatus	Marital Status	4
Employvar	Employment Status	0
OftenCare	Often Receive Care	25
RoutineCare	Routinely Receive Care	0
Insured	Insurance Status	7
AgeGroup	Age Groups	4
Ratio	Poverty to Income Ratio	252
BMI	Body Mass Index	0
Education	Education Level	4
BPXSY1	Systolic Blood Pressure	124
BPXDI1	Diastolic Blood Pressure	124
Unemploy	Reason Unemployed	523

*Notes: N = 1476.*

## **CHAPTER 5**

### **RESULTS**

#### **Sample Description**

The study included a sample of 1,476 African American women over the age of 20 years who have been told by a doctor that they had hypertension or high blood pressure. The mean age of the women in the sample was 57 years; average systolic blood pressure was 134 (prehypertensive) and average diastolic blood pressure was 71. Additionally, a majority of the sample was obese (69%), and 65% of the women reported being low-income. The descriptive characteristics of the study sample are listed in Tables 2 and 3.

A majority of the sample reported (Table 3) that they were currently taking medication for high blood pressure (95%,  $n = 1381$ ), exercising (71.1%,  $n = 754$ ), and reducing salt intake (92.5%,  $n = 1018$ ). Additionally a majority of the women reported having no children in the home (64.7%,  $n = 1035$ ), working part time (75.5%,  $n = 1131$ ), and being married or cohabiting (30.7%,  $n = 431$ ).

#### **Model Testing**

Logistic regression models were fit to the NHANES data to estimate the effect of African American women's social roles on the odds of sick role acceptance. In review, the study model includes three main effects (marital status, employment status, and parental status) in addition to

Table 2

*Demographic Characteristics of Study Sample*

Characteristics	<i>N</i>	%
Age group		
20 - 29	15	1.2
30 - 39	83	12.5
40 - 49	146	13.3
50 - 59	357	26.5
60 - 69	484	22.5
70 - 79	283	17.5
>80	104	6.5
Education		
<=11th grade	474	30.3
High school	359	25.1
Some college or associate's degree	480	34.0
College graduate or above	159	10.5
Body mass index (BMI)		
Obese	970	69.0
Overweight	295	18.6
Normal	174	10.5
Underweight	37	1.8
Moderate physical activity		
Yes	403	71.3
No	1073	28.7
Unemployment reason		
Taking care of house	47	5.1
Going to school	5	0.7
Retired	477	40.4
Health reasons	206	24.0
Layoff	13	1.6
Disabled	252	28.2
Income to poverty ratio		
Low income	794	65.1
Middle income	192	15.0
High income	238	19.8
Routine source of care		
Yes	1426	97.3
No	25	1.4
Multiple places	25	1.3

Note: *N* = 1476

Table 3

*Study Variables and Incidence in Variable in Study Sample*

Variable	N	%
Dependent variables		
Medication		
Yes	1381	95.3
No	58	4.7
Exercise		
Yes	754	71.1
No	307	28.8
Reducing salt		
Yes	1018	92.4
No	79	7.6
Independent variables		
Marital status		
Married or cohabiting	431	30.7
Widowed	430	25.1
Divorced or separated	353	22.3
Never married (single)	258	21.8
Parental status		
No children in home	1035	64.7
Children in home	441	35.3
Employment		
Full time	298	21.2
Part time	1131	75.5
Unemployed*	47	3.3
Moderating variables		
Health insurance		
Yes	1351	91.3
No	118	8.7
Care utilized most often		
Clinic or health center	235	14.7
Doctor office or HMO	1111	77.1
Emergency room	51	4.8
Outpatient service	44	2.6
Other	10	0.76

Notes: N = 1476. \*Unemployment was combined with part-time employment for the logit analysis due to small numbers.

the examination of interaction effects (insurance and usual source of care). As this study utilizes variables derived from theory and the research literature, no model fit statistics were necessary to determine goodness of fit, normality, correlation, or multicollinearity. Bivariate analysis and binomial and multinomial logistic regression were utilized to examine each model and answer the study's research questions. Model interpretation was achieved by examining Wald chi-square ( $\chi^2$ ), 95% confidence intervals (CI),  $p$  values, and odds ratios ( $OR$ ) for the parameter estimates, as well as an examination of least squares means (LS-means). LS-means are, in effect, within-group means appropriately adjusted for the other effects in the model. More precisely, they estimate the marginal means and should be used when inferential comparisons need to be made.

**Bivariate analysis.** To answer whether sick role acceptance is a function of a woman's social roles, bivariate logistic regression models were run for each dependent variable (i.e., medication, exercise, and reduced salt intake) with a single independent variable (i.e., marital status, employment status, and parental status). For example, the first binomial equation modeled the probability of not taking medication based on whether or not a woman reported she had children in her home (i.e., the variable "Kids"). There were no significant models in the bivariate analysis. Models are listed in Table 4.

The least squares means column reports information on the best estimated probability of the sample *not* performing the adherence behavior. Table 4 reports that women with children in the home (6.10%), women who are married or cohabiting (5.34%), and those who work full time (7.04%) have a higher probability of not taking their medication. Additionally, for salt intake, women with no children (8.56%), those who are widowed (10.5%), and those who report full-time employment (2.68%) have a higher probability of non-adherence. Finally for exercise,

women with children (7.53%), those who are divorced or separated (3.20%), and women who work full time (3.60%) have a higher probability of non-adherence.

Table 4

*Bivariate Model Analysis with Only One Main Effect and Modeled Probabilities of Event(0)*

Model	OR	95% CI	LSM %
Meds * Kids (0 vs. 1)	0.60	(0.24 - 1.50)	Kids (0) - 3.76 Kids (1) - 6.10
Meds * Mrtlstatus (1 vs. 4)	1.18	(0.46 - 3.04)	Mrtlstatus (1) - 5.34
Meds * Mrtlstatus (2 vs. 4)	1.40	(0.21 - 5.24)	Mrtlstatus (2) - 4.73
Meds * Mrtlstatus (3 vs. 4)	0.74	(0.23 - 2.32)	Mrtlstatus (3) - 3.39 Mrtlstatus (4) - 4.55
Meds * Employment (1 vs. 2)	1.86	(0.29 - 1.28)	Employment (1) - 7.04 Employment (2) - 3.91
Salt * Kids (0 vs. 1)	1.52	(0.46-5.10)	Kids (0) - 8.56 Kids (1) - 5.79
Salt * Mrtlstatus (1 vs. 4)	2.22	(0.37-13.17)	Mrtlstatus (1) - 8.30
Salt * Mrtlstatus (2 vs. 4)	2.87	(0.79-10.44)	Mrtlstatus (2) - 10.5
Salt * Mrtlstatus (3 vs. 4)	1.90	(0.30-11.93)	Mrtlstatus (3) - 7.19 Mrtlstatus (4) - 3.92
Salt * Employment (1 vs. 2)	1.55	(0.70-3.40)	Employment (1) - 2.68 Employment (2) - 1.80
Exercise * Kids (0 vs. 1)	1.14	(0.45-2.93)	Kids (0) - 2.98 Kids (1) - 7.53
Exercise * Mrtlstatus (1 vs. 4)	0.95	(0.25-3.64)	Mrtlstatus (1) - 2.77
Exercise * Mrtlstatus (2 vs. 4)	0.92	(0.21-4.00)	Mrtlstatus (2) - 2.71
Exercise * Mrtlstatus (3 vs. 4)	1.17	(0.23-5.86)	Mrtlstatus (3) - 3.20 Mrtlstatus (4) - 2.88
Exercise * Employment (1 vs. 2)	1.56	(0.76-3.20)	Employment (1) - 3.60 Employment (2) - 2.65

*Notes:* Kid (0) = No children in home. Kid (1) = Children in home. Mrtlstatus (1) = Married or cohabiting. Mrtlstatus (2) = Widow. Mrtlstatus (3) = Divorced or separated. Mrtlstatus (4) = Never married (single). Employment (1) = Full-time employment. Employment (2) = Not full-time employment.

**Multivariable analysis.** To examine the cumulative effects of having multiple social roles on sick role acceptance, multiple logistic regression was used to simultaneously examine

the relative contributions of individual independent variables to each outcome, controlling for the other independent variables in the model. Table 5 presents the results of that analysis. None of

Table 5

*Multivariable Analysis Demonstrating Odds of Non-adherence to Medical Recommendations and Adherence Level*

Variable	OR	CI
<b>Medication</b>		
Kids (0 vs. 1)	0.57	(0.23 -1.41)
Mrtlstatus (1 vs. 4)	1.19	(0.42- 3.32)
Mrtlstatus (2 vs. 4)	1.45	(0.28 -7.45)
Mrtlstatus (3 vs. 4)	0.73	(0.20 -2.59)
Employment (1 vs. 2)	2.04	(0.77 -5.40)
<b>Exercise</b>		
Kids (0 vs. 1)	1.18	(0.44 -3.17)
Mrtlstatus (1 vs. 4)	0.83	(0.21 -3.29)
Mrtlstatus (2 vs. 4)	0.91	(0.19 -4.50)
Mrtlstatus (3 vs. 4)	1.05	(0.21 -5.26)
Employment (1 vs. 2)	1.60	(0.81 -3.13)
<b>Salt</b>		
Kids (0 vs. 1)	1.32	(0.36 -4.90)
Mrtlstatus (1 vs. 4)	1.86	(0.35 - 9.80)
Mrtlstatus (2 vs. 4)	2.80	(0.65 - 11.83)
Mrtlstatus (3 vs. 4)	1.57	(0.27 - 9.30)
Employment (1 vs. 2)	1.77	(0.99 - 3.12)
<b>Accept (1)</b>		
Kids 0 vs. 1	2.20	(0.30 – 15.91)
Mrtlstatus 1 vs. 4	7.80	(0.59-103.39)
Mrtlstatus 2 vs. 4	5.60	(0.43 - 73.31)
Mrtlstatus 3 vs. 4	5.82	(0.62 - 54.22)
Employment 1 vs. 2	1.65	(0.62 - 4.33)
<b>Accept (2)</b>		
Kids (0 vs. 1)	0.88	(0.37 – 2.14)
Mrtlstatus (1 vs. 4)	0.90	(0.20 - 4.11)
Mrtlstatus (2 vs. 4)	1.03	(0.21 - 5.16)
Mrtlstatus (3 vs. 4)	0.96	(0.15 - 6.26)
Employment (1 vs. 2)	1.34	(0.66 -2.73)

Notes: Kid (0) = No children in home. Kid (1) = Children in home.  
Mrtlstatus (1) = Married or cohabiting. Mrtlstatus (2) = Widow. Mrtlstatus (3) = Divorced or separated. Mrtlstatus (4) = Never married (single).  
Employment (1) = Full-time employment. Employment (2) = Not full-time employment. Accept (1) = Medication only. Accept (2) = Medication and salt reduction or Medication and Exercise. Accept (3) = All medical recommendations.

the models was significant. Analysis of the least squares means revealed similar estimates to the bivariate analysis; however, the estimates were made after controlling for other variables in the model. For medication non-adherence, working full time (8%), being widowed (7%), and having a child in the home resulted in a higher estimated probability. For exercise, non-adherence, women who reported working full time (36%), being currently divorced or separated (33%), and having no children (33%) had a higher estimated probability. Finally, the estimated probability of non-adherence to salt reduction recommendations was highest for women with full-time employment (10%), women who reported being widowed (12%), and those with no children (9%).

A multinomial logistic regression model was used to examine the polytomous dependent variable “accept” (i.e., level of adherence to medical recommendations). In a multinomial regression, one level of the response variable is treated as the referent group, and then a model is fit for each of the remaining levels compared to the referent group. Of the three levels of the accept variable, accept level 3 (reporting adherence to all three recommendations) was the referent level. None of the models was significant. Table 6 presents the least squares means estimates.

**Moderation (interaction) models.** This research study also examined whether the effect of the main independent variables on the outcome variables, was dependent on the value of a moderator variable. Specifically, the study tests for the ability of health insurance and/or having a usual source of care, to moderate the relationship between social roles and sick role acceptance. A statistical interaction occurs when the effect of one independent variable on the dependent variable *changes* or *varies* depending on the level of another independent variable. To test for the presence of interactions, the interaction terms were added one at a time to the main effects



Table 6

*Least Squares Means Estimates for Probability of Adherence to All Three Recommendations*

Variable	Medication Only	Medication + 1 Lifestyle Recommendation	All 3 Recommendations
Marital status			
<i>Married or cohabiting</i>	0.08800 (9%)	0.3633 (36%)	55%
<i>Widowed</i>	0.08368 (8%)	0.3506 (35%)	57%
<i>Divorced or separated</i>	0.08226 (8%)	0.3464 (35%)	57%
<i>Never married (single)</i>	0.06708 (7%)	0.2983 (30%)	63%
Employment			
<i>Full time</i>	0.09381 (9%)	0.06786 (7%)	84%
<i>Not full time</i>	0.3797 (4%)	0.3009 (30%)	66%
Kids			
<i>No children</i>	0.08507 (9%)	0.07497 (7%)	84%
<i>Children</i>	0.3547 (4%)	0.3240 (3%)	93%

model. Tables 7 through 10 illustrate the results of the modeled interaction terms and are described in terms of non-adherence to medical recommendations. Models with significant interaction terms are reported in tabular form, as are the proportion of the social roles that are non-adherent to medical recommendations.

**Medication.** The results detailed in Table 7 show a significant interaction between two of the focal predictors (parental and marital status, but not employment) and one of the moderators (insured but not usual source of care). The overall Wald chi square is significant for the both the Insured\*Kids ( $\chi^2 = 24.70$ ,  $df = 1$ ,  $p < .0001$ ) and Insured\*Mrtlstatus ( $\chi^2 = 411.20$ ,  $df = 2$ ,  $p < .0001$ ) interactions. There was nothing unique about the combination of the other focal predictor and moderator combinations modeled.

Table 7

*Results of Insured and Usual Source of Care as Moderators Between the Focal Predictor and Medication Adherence*

Interactions	DF	Wald $\chi^2$	Pr > Wald $\chi^2$
Doctors Office/HMO*Kids	0	0	.
Doctors Office/HMO*Mrtlstatus	0	0	.
Doctors Office/HMO*Employment	3	3.6703	0.2993
Insured*Kids	1	24.6817	<.0001
Insured* Mrtlstatus	2	411.1885	<.0001
Insured* Employment	0	0	.

**Probability of non-adherence to medication.** Estimates of non-adherence to medication were not particularly useful for understanding health behaviors, primarily because 95% of the sample is performing the behavior, resulting in empty cells (see tables in Appendix). Estimates of negative infinity to infinity occurred in the presence of very small numbers in the non-adherence group. For example, 2% of women who report usual care with a doctor or HMO and having no children are non-adherent, while 3% of married women who report usual care with a doctor or HMO are non-adherent with medication. Similarly, because insured rates were at 91%, probability estimates were not particularly useful. Complete medication non-adherence tables are located in the Appendix.

**Salt intake.** The results detailed in Table 8 show a significant interaction between two of the focal predictors (parental and marital status, but not employment), with marital status showing a significant interaction for both insured and usual source of care, and parental status significant only with insurance. The overall Wald chi square for Doctors office/HMO \*Mrtlstatus ( $\chi^2 = 1048.7$ ,  $df = 2$ ,  $p < .0001$ ). The overall Wald chi square is significant for the both the Insured\*Kids interaction ( $\chi^2 = 91.8$ ,  $df = 1$ ,  $p < .0001$ ) and Insured\* Mrtlstatus ( $\chi^2 =$

121.6,  $df = 3$ ,  $p < .0001$ ). There is nothing unique about the combination of the other focal predictor and moderator combinations modeled. The interpretation of the odds ratio, although significant, was not useful in this analysis due to the large number of women who reported currently reducing salt in the sample.

Table 8

*Results of Insured and Usual Source of Care as Moderators between the Focal Predictor and Salt Intake Reduction*

Interactions	<i>DF</i>	Wald $\chi^2$	Pr > Wald $\chi^2$
Doctors Office/HMO*Kids	1	3.2740	0.0704
Doctors Office/HMO*Mrtlstatus	2	1048.7315	<.0001
Doctors Office/HMO*Employment	1	0.0452	0.8317
Insured*Kids	1	91.8237	<.0001
Insured* Mrtlstatus	3	121.6452	<.0001
Insured* Employment	0	0.0000	.

***Probability of non-adherence to salt reduction.*** An analysis of probability of non-adherence revealed that for salt reduction, the highest probabilities for non-adherence were among parents with no regular doctor or HMO (21%), followed by women with no children but a usual place of care (10%). Additionally, married women with no regular doctor or HMO had a 19% non-adherence probability, followed by widowed women with no regular doctor or HMO (16%), and divorced women who had a usual source of care (12%). Finally, for those women who were not employed full time and had no usual source of care, the estimated percentage of non-adherence was 15%.

The salt reduction non-adherence estimates for parental status and insured as the moderator, had the highest rate of non-adherence among women who were without children but insured (10%). In non-adherence estimates for marital status and insured, women who were widowed had a higher estimated percentage (11%), followed by married women (9%). Finally, for women who were insured but not working full time, the non-adherence estimate was 7%. Complete salt reduction adherence tables are located in the Appendix.

**Exercise.** The results detailed in Table 9 show a significant interaction between two of the focal predictors (parental and marital status, but not employment). The overall Wald chi square for the Insured\*Kids interaction is significant ( $\chi^2 = 145.3$ ,  $df = 1$ ,  $p < .0001$ ), as is the overall Wald chi square for Insured\*Mrtlstatus ( $\chi^2 = 113.11$ ,  $df = 2$ ,  $p < .0001$ ). There is nothing unique about the combination of the other focal predictor and moderator combinations modeled. The interpretation of the odds ratio, although significant, was not useful in this analysis due to the large number of women who reported currently exercising in the sample.

Table 9

*Results of Insured and Usual Source of Care as Moderators between the Focal Predictor and Exercise Adherence*

Interactions	DF	Wald $\chi^2$	Pr > Wald $\chi^2$
Doctors Office/HMO*Kids	1	0.3311	0.5650
Doctors Office/HMO*Mrtlstatus	3	3.6703	0.2993
Doctors Office/HMO*Employment	1	1.7988	0.1799
Insured*Kids	1	145.3336	<.0001
Insured* Mrtlstatus	2	113.1313	<.0001
Insured* Employment	0	0.0000	.

***Probability of non-adherence to exercise.*** In examining probability estimates for exercise non-adherence for parental status, analysis revealed non-adherence rates for each combination ranging from 21% (children in home and usual source of care) to 35% (no children and no usual source of care). For marital status, women who were widowed with no usual source of care had a non-adherence rate of 55%, with the lowest exercise non-adherence rate at 14% for divorced or separated women with no usual source of care. Finally, women who reported not working full time and having a usual source of care had an estimated non-adherence rate of 42%, followed those who worked full time and had no regular doctor or HMO (37%).

In examining the probability estimates for exercise non-adherence with the moderator “insured,” there was a high probability of non-adherence (33%) for both parents and non-parents who were insured. The probability for non-adherence was similar for all marital categories, ranging from 32% (divorced or separated and never married [single]) to 35% (married or cohabiting). Finally, for the who reported not working full time and being insured, the estimated percentage of non-adherence was 36%. Full exercise adherence tables are in the Appendix.

**“Accept” variable.** The results detailed in Table 10 show a significant interaction between all three of the focal predictors (parental, marital, and employment status) and one of the moderators (insured but no usual source of care). The overall Wald chi square is significant for the both the Insured\*Kids ( $\chi^2 = 134.2$ ,  $df = 1$ ,  $p < .0001$ ) and Insured\*Mrtlstatus ( $\chi^2 = 114.3$ ,  $df = 3$ ,  $p < .0001$ ) interactions, as well as the Insured\*Employment ( $\chi^2 = 235.0$ ,  $df = 1$ ,  $p < .0001$ ) interaction. There is nothing unique about the combination of the other focal predictor and moderator combinations modeled. The reference category was adherence to only one of the medical recommendations (medication, exercise, or salt reduction). Those numbers were too small to be useful for probability analysis.

Table 10

*Results of Insured and Usual Source of Care as Moderators Between the Focal Predictor and Level of Acceptance*

Interactions	<i>DF</i>	Wald $\chi^2$	Pr > $\chi^2$
Doctors Office/HMO*Kids	1	0.0709	0.7900
Doctors Office/HMO*Mrtlstatus	3	3.2623	0.3529
Doctors Office/HMO*Employment	1	1.2591	0.2618
Insured*Kids	1	134.2324	<.0001
Insured* Mrtlstatus	3	114.3723	<.0001
Insured* Employment	1	234.9560	<.0001

The interpretation of these results in the context of the current theories and understanding of hypertension and social roles is presented in the final chapter. Further, study limitations, the strengths of the study, as well as recommendations for further research and a discussion of the potential impact of role conflict in social work are presented.

## **CHAPTER 6**

### **DISCUSSION AND CONCLUSIONS**

The primary purpose of this study was to examine the relationship that an African American woman's existing social roles play in sick role acceptance behaviors, utilizing a role theory and stress and coping theoretical framework. The researcher hypothesized that failure to accept the sick role would be demonstrated by non-adherence to medical recommendations for treatment of hypertension. Conversely, evidence of sick role acceptance would be demonstrated by adherence to a combination of recommended lifestyle modification and prescribed medication.

Secondary data analysis was performed with variables extracted from the National Health and Nutrition Examination Survey (NHANES) years 2011 and 2012 (CDC, 2013). Multiple logistic regression to model the probability of non-adherence was appropriate for this dissertation analysis as the outcome variables were dichotomous (binary), and multiple categorical independent variables (i.e., marital status, employment status, and parental status) were of interest in the analysis.

#### **Research Questions**

The first study question asked if sick role acceptance is a function of African American women's status roles. To test this question, bivariate analysis was conducted to determine the direct relationship between variables. The null hypothesis that there was no association between the dichotomized outcome variables (i.e., medication, salt reduction, and exercise) and the

categorical independent variables (i.e., marital status, employment status, and parental status) could not be rejected. However, least squares means analysis provided the best available estimation of the probability of non-adherence. Summarized, women who reported having children in the home, along with those who were widowed and those who worked full time, had a higher probability of non-adherence to medication. Those women who reported having no children in the home, along with those who were married or cohabiting and those working full time, had a higher probability of non-adherence to salt reduction. Finally, women with children in the home, in addition to those who were divorced or separated, and those working full time, had a high probability of non-adherence to exercise. The only social role that appeared to increase the probability of non-adherence across all bivariate analyses of medical recommendations was being employed full time.

The second research question asked if there are cumulative effects of having multiple social roles on sick role acceptance. To answer this question, both binomial and multinomial logistic regression were used to model the relationship between the independent variables and the outcome variables, controlling for other variables in the model. Neither the binomial nor the multinomial logistic regression analysis yielded significant models. As such, the null hypothesis could not be rejected. An examination of the least squares means again showed that working full time consistently yielded a higher probability of non-adherence. That said, there was a relatively low incidence of non-adherence. In the multinomial regression, a majority of the sample was actively taking medications, reducing salt, and exercising (i.e., level 3 of the “accept” variable), and most of the others were actively taking medications and engaging in at least one lifestyle modification recommendation (i.e., “accept” variable level 2).



The final two research questions examined whether the effect of the primary independent variables on the outcome variables is dependent on the value of a moderator variable.

Specifically, this study tests whether having health insurance and/or having a usual source of care moderates the relationship between social roles (i.e., marital status, employment status, and parental status) and sick role acceptance. A summary of those findings include:

- a. Significant moderation for the interactions of being insured and parental status, as well as being insured and marital status, for non-adherence to medication.
- b. Significant moderation for the interactions of having a usual source of care and marital status; being insured and parental status, as well as being insured and marital status, for non-adherence to salt reduction.
- c. Significant moderation for the interactions of being insured and parental status, as well as being insured and marital status, for non-adherence to exercise.
- d. Significant moderation for the interactions of being insured and parental status; being insured and marital status, as well as being insured and employment status, for level of adherence.

### **Interpretation of the Findings**

This study was restricted to women who self-identified as African American and reported being told by a doctor or other health professional that they had high blood pressure. As expected from the review of the literature, the sample was predominantly obese or overweight. However, the sample was unexpectedly physically active, had lower blood pressure rates than expected, reported routinely seeing a physician, and were mostly insured. Additionally, while the research literature shows that medical non-adherence can be an issue for African American patients, this was not the case for the sample utilized in this analysis (Brown & Kountz, 2015). In fact, the vast

majority of the women studied were not only taking their medication for hypertension but were actively reducing salt and exercising, and doing so in combination. In other words, the women in the study sample had, according to the study definition, accepted the sick role and were actively engaged in behaviors to promote wellness.

Although this study was interested in non-adherence behaviors for hypertension, understanding how this sample reports high rates of adherence to behaviors to reduce hypertension in opposition to what we understand about health disparities in African American women is important. As such, it may be useful to examine relevant social role characteristics of the sample. Interestingly, the mean sample age was close to 60 years old, and a majority of these women reported households with no children, resulting in fewer women in a parenting role. Additionally, a majority of these women reported being low-income, with their primarily employment status being part time. These demographic characteristics could be important. Although this study was unable to directly measure stress and coping, from the literature it is clear that African American single mothers often find themselves living below the poverty line and are especially vulnerable to depression due to chronic stressors and poverty (Broussard et al., 2012; Hatcher et al., 2008; U.S. Census Bureau, 2011). To be without the combined stress of having to care for a child alone while holding down a job, and to be working only part time (as opposed to full time) would fit the theoretical narrative of an appraisal of having adequate resources to move toward sick role acceptance. Further, this supports the study finding that being employed full time was the only social role that appeared to increase the probability of non-adherence across all bivariate analyses of medical recommendations.

Still, there are some findings that conflict with what is found in the literature on African American women and hypertension. For example, the literature points to both low education and

overweight and obesity as a link to hypertension. Collins and Winkleby (2002) found that African American women at risk for uncontrolled blood pressure were likely to be those with low levels of education. A majority of the women in this study had educational attainment levels of high school diploma or below. Additionally, this sample was predominantly overweight or obese, which also has a clear link to CHD and high blood pressure in the literature. Nonetheless, these women seemed to be successful in treating their high blood pressure. Perhaps this could be partially explained by physical activity level. Increasing physical activity is an effective way to manage hypertension, but African American women are one of the least physically active racial/ethnic/gender groups (e.g., Crespo, Smith, Andersen, Carter-Pokras, & Ainsworth, 2000). However, women in this sample were more likely to report that they were currently exercising. In sum, the factors for success in controlling hypertension for these women (e.g. older age, no children in the home) remain unclear. Further analysis with this sample could examine additional covariates to help identify specific pathways to successfully controlling hypertension..

In examining the moderator variables (i.e., insured and usual source of care), again, a majority of the women in the study were insured and had a regular doctor or HMO that they were able to access for care. The research has found that African American women are less likely to have health insurance (Kaiser Family Foundation, 2013), less likely to have a primary care physician or usual source of care (Agency for Healthcare Research and Quality, 2011), and are more likely to utilize emergency care as a usual source of care (Zuckerman & Shen, 2004). However, this was not the case for this sample. While the examination of these moderator variables produced significant *p*-values for the contribution of insurance on the relationship between social roles and sick role acceptance, results must be interpreted cautiously because the majority of the sample was insured and actively engaging in positive health behaviors for

hypertension management. This lack of variability in group membership makes the odds ratios less useful for interpretation.

Overall, the findings of this study indicate that we cannot confidently conclude that there is a direct or indirect relationship between social roles and sick role acceptance based on the analysis of the NHANES data. We are only able to, at best, estimate the relationships.

Essentially, this research was tasked with examining the influence of social roles on medical non-adherence in a sample that was nearly fully compliant with medical recommendations for hypertension. As might be expected, this task was extremely difficult due to the limited variance in the data.

### **Strengths and Future Research**

To date, no study utilizing the National Health and Nutrition Examination Survey has examined the impact of social roles on sick role acceptance among African American women at risk for CHD indicated by a hypertension diagnosis. Further, to date no study has utilized theories of role conflict, role enhancement, and stress and coping to study African American women's strength in order to understand the process of health decision-making. As such, this research represents an innovative approach to conceptualizing factors that contribute to the persistent health disparities among African American women as well as understanding the social and behavioral motivations that impact adherence to medical recommendations. The strength of the theoretical literature on stress and coping among African American women and disease suggests that it may be useful to study how women rank their perceived level of stress associated with their status and accompanying roles. For example, two women may report being married, but one marriage may be supportive, with shared responsibilities and mutual respect, while the other is fraught with tension and role imbalance (e.g., one person is responsible for the household

and children and also has a job outside the home). Future research must quantitatively address the level of stress women assign to each role, as stress has a tremendous influence on high blood pressure.

Finally, this sample is successfully achieving the distal outcomes this research seeks to influence (i.e., reducing the risk of CHD by reducing blood pressure). As such, there is an opportunity to spend some time examining this sample—or identifying a comparable sample of women—in an effort to identify factors that work to contribute to their success. This could be achieved by conducting focus groups in addition to tailored survey development. The foundation of this dissertation research study was the pursuit of understanding the factors that work to influence health behavior changes. Despite our understanding of the effective evidence-based lifestyle and pharmacological interventions that significantly impact disease, disparities among African American women persist.

### **Potential Study Limitations**

The NHANES dataset is one of the nation's most comprehensive collections of health-related information on adults and children. While there are clear advantages to its use, including reduced study expenses, free access, as well as time saved in data collection, there are also limitations that accompany the use of this and any other secondary data. First, as the data were not collected directly by the researcher, there was no control over the construction of the questionnaire and thus the analysis is limited to the questions and measures collected by the original investigators. This can impact measures that may have been necessary to discover theoretically significant associations. For example, there were no survey items that measured natural social supports such as being part of a faith community. People often find social support and a feeling of belonging in religious activity and religious organizations (Ferraro et al., 1994).

Religion and spirituality are embedded in African American culture and religious institutions and provide the setting and key resources for an increasing number of interventions for health promotion and disease prevention. Further, African Americans are more likely than other racial and ethnic groups to rely on religious and family support systems rather than formal care (Hargrove, 2006; Pickard, Inoue, Chadiha, & Johnson, 2011). However there were no survey items that addressed caregiver support even though research has documented that caregiving has been linked to an increased risk of cardiovascular disease in women and is a top barrier to taking preventive health action (Mosca, Mochari-Greenberger, Dolor, Newby, & Robb, 2010). These caregiving roles may be difficult or impossible to negotiate when personal sickness occurs, forcing women to make extremely hard choices between their own needs and the caregiving needs of others.

Additionally, the outcome variables were binary and self-report. As such this study was unable to determine any dose response relationships for medication, exercise or salt intake with the variables utilized. For example it was not possible to determine how much each participant reduced salt intake compared to another or how much medication was prescribed for one vs another. Future studies might consider examining, for example, self-reports of exercise in conjunction with exact number of hours they report doing physical activity weekly compared to national recommendation. Also, collecting data on consumption and reduction of processed food products could yield more information about salt reduction compliance. The NHANES did contain a physical activity variable that could be used to examine moderate activity levels and should be considered for a fuller understanding in future studies. Further future studies may also consider controlling for age, BMI, and poverty ratio in the model. Efforts at a parsimonious analysis limited this research to utilizing them as sample characterizations only.

Further, research questions used for analysis could not probe for the quality of the social roles (e.g., rating of marital or job satisfaction) to demonstrate the inherent personal and social value associated with those roles. The research could only ascertain membership in a status—not the respondents' self-report of the positive or negative impact of that status and its roles. Additionally, there may be social desirability bias associated with answering some of the questions. Social desirability refers to the tendency of the respondent to report socially favorable behaviors when the question is sensitive. Specifically, each of the dependent variables (medication, salt reduction, and exercise) are behaviors directly related to the diagnosis of high blood pressure and medical recommendations for treatment. Respondents may feel embarrassed about non-adherence and thus respond that they are performing these behaviors when in fact they are not.

Finally the women in the study were determined to be sick role labeled after confirmation with a doctor or medical professional. The hypertension diagnosis of this study was confirmed with three separate blood pressure examination. However in general, hypertension is asymptomatic for a majority of the population. In fact not only is hypertension asymptomatic, several of illness including diabetes, stroke, and heart disease have no immediate symptoms. It is possible that studying a chronic illness like overweight an obesity that has more obvious symptoms could have yielded different result allowing for an analysis of both illness behaviors as well as sick role behaviors.

### **Conclusions and Implications for Social Work Research and Practice**

Talcott Parsons's (1951) original interpretation of the sick role was as a role of deviance sanctioned by society. As such, society has always had an expectation that those who are sick work to get well and eventually return to a role of productive society member. Failing to do so

would make one a burden on society. However, when people are faced with illness, there is not always an automatic acceptance of this new sick role. How individuals arrive at their decision to heal is clearly a function of not only their individual behaviors, but the powerful mediating influences of the society and culture in which they live.

This dissertation sought to explore the competing obligations of African American women's existing social roles in their decision to take on the role of being sick. Effectively reducing racial disparities for CHD requires identifying and reducing disparities in risk factors, with high blood pressure being most the common of those risk factors (Kanell, 1995). As the prevalence of modifiable risk factors for CHD remains high among this population, there is an urgency as well an obligation to tenaciously explore not only factors that contribute to disease, but ultimately those that contribute to wellness. It has been 30 years since the 1985 Heckler Report became the driving force for ending health disparities and advancing health equity in America. However, 30 years later we are still struggling to understand and eliminate those disparities among African American women.

The greatest improvements in African American health status have resulted from attempts such as the Freedman's Bureau, the Civil Rights Act of 1963, and Healthy People 2010 to address systemic disparities in health care access and disease burden. However, to address the persisting inequalities, it is necessary to further examine the contributions of systems, policies, and institutions, as well as individual motivation, in developing theories and interventions to improve the admittedly complex process of health seeking behavior. Health outcomes are shaped not only by individual choices but by the inequitable distribution of assets, as well as power differentials at both the national and local levels—all of which influence policy choices. This dissertation sought to contribute to the current body of health disparities research by presenting a



novel application of role and stress and coping theories specific to African American women and their health behaviors, recognizing the complexities that transpire in the process of accepting sickness.

**Social work.** As the primary mission of the professional social worker is to “enhance human well-being and meet basic needs,” closing the health disparities gap should be paramount (NASW, 2008). Minority women in general have a bleaker health-related quality of life and the field of social work is well-suited to address the causes of this injustice. Every day, over 500,000 social workers are actively serving in the United States, and half are employed in health care and health-related settings (Van Pelt, 2009). Social workers thus are uniquely positioned to address disparities in health as well as the psychosocial stressors that accompany a chronic illness like hypertension, and also to support the recovery process. There remains a need to not only identify the natural helping resources that African American women use, but to understand the factors that influence them to use those resources to navigate sickness. Because of social workers’ presence in multiple types of practice settings including individual counseling, health care settings, and political advocacy and lobbying, in addition to academic and research settings, the field of social work has an opportunity and responsibility to effectively advocate for the changes necessary to improve the health outcomes of African American women.

## APPENDIX A

### TABLES

Table 11.

*Interaction Results for Medication, Kids, and Often Care*

#### The MEANS Procedure

<i>Analysis Variable : NonCompliant</i>			
<i>OFTENCARE</i>	<i>kids</i>	<i>N Obs</i>	<i>Mean</i>
0	0	149	0
	1	33	0
1	0	428	0.0202990
	1	232	0

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Doctors Office/HMO No Kids	0.000	0.000
Not Doctors Office/HMO Kids	0.000	0.000
Doctors Office/HMO No Kids	0.020	0.070
Doctors Office/HMO Kids	0.000	0.000

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Doctors Office/HMO	1	13.6381	0.0002
Marginal Kids	1	12.8397	0.0003
Doctors Office/HMO*Kids	0	0.0000	.
Not Doctors Office/HMO: Kid	0	0.0000	.
Doctors Office/HMO: Kid	1	25.6793	<.0001

Table 12.

*Interaction Results for Medication, Marital Status, and Often Care***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>				
<i>OFTENCARE</i>	<i>Mrtlstatus</i>	<i>N</i> <i>Obs</i>	<i>Mean</i>	
0	1	48	0	
	2	59	0	
	3	51	0	
	4	24	0	
1	1	194	0.0317189	
	2	184	0	
	3	148	0.0084864	
	4	134	0	

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Doctors Office/HMO MRTLSTATUS=1	0.000	0.000
Not Doctors Office/HMO MRTLSTATUS=2	0.000	0.000
Not Doctors Office/HMO MRTLSTATUS=3	0.000	0.000
Not Doctors Office/HMO MRTLSTATUS=4	0.000	0.000
Doctors Office/HMO MRTLSTATUS=1	0.032	1.002
Doctors Office/HMO MRTLSTATUS=2	0.000	0.000
Doctors Office/HMO MRTLSTATUS=3	0.008	0.234
Doctors Office/HMO MRTLSTATUS=4	0.000	0.000

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Doctors Office/HMO	1	0.3121	0.5764
Marginal Marital Status	3	0.8842	0.8292
Doctors Office/HMO*Marital Status	0	0.0000	.
Not Doctors Office/HMO: Marital Status	0	0.0000	.
Doctors Office/HMO: Marital Status	3	1.2113	0.7503

Table 13.

*Interaction Results for Medication, Employment, and Often Care***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>				
<i>OFTENCARE</i>	<i>Employvar</i>	<i>N</i> <i>Obs</i>	<i>Mean</i>	
0	0	35	0	
	1	147	0	
1	0	155	0.0423074	
	1	505	0.0022645	

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Doctors Office/HMO Not Full Time	0.000	0.000
Not Doctors Office/HMO Full Time	0.000	0.000
Doctors Office/HMO Not Full Time	0.042	0.037
Doctors Office/HMO Full Time	0.002	0.000

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Doctors Office/HMO	1	546.4156	<.0001
Marginal Employment Status	1	10.2954	0.0013
Doctors Office/HMO*Employment Status	1	1.9736	0.1601
Not Doctors Office/HMO: Employment Status	1	2.4713	0.1159
Doctors Office/HMO: Employment Status	1	12.2976	0.0005

Table 14.

*Interaction Results for Salt, Kids, and Often Care***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>			
<i>OFTENCARE</i>	<i>kids</i>	<i>N Obs</i>	<i>Mean</i>
0	0	149	0.0825716
	1	33	0.2113925
1	0	428	0.1033175
	1	232	0.0285716

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Doctors Office/HMO No Kids	0.083	0.056
Not Doctors Office/HMO Kids	0.211	0.183
Doctors Office/HMO No Kids	0.103	0.032
Doctors Office/HMO Kids	0.029	0.013

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Doctors Office/HMO	1	1.8715	0.1713
Marginal Kids	1	0.0268	0.8699
Doctors Office/HMO*Kids	1	3.2740	0.0704
Not Doctors Office/HMO: Kid	1	0.6005	0.4384
Doctors Office/HMO: Kid	1	5.5151	0.0189

Table 15.

*Interaction Results for Salt, Marital Status, and Often Care***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>			
<i>OFTENCARE</i>	<i>Mrtlstatus</i>	<i>N Obs</i>	<i>Mean</i>
0	1	48	0.1979761
	2	59	0.1560501
	3	51	0
	4	24	0
1	1	194	0.0644824
	2	184	0.0895801
	3	148	0.1171364
	4	134	0.0311789

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Doctors Office/HMO MRTLSTATUS=1	0.198	0.191
Not Doctors Office/HMO MRTLSTATUS=2	0.156	0.186
Not Doctors Office/HMO MRTLSTATUS=3	0.000	0.000
Not Doctors Office/HMO MRTLSTATUS=4	0.000	0.000
Doctors Office/HMO MRTLSTATUS=1	0.064	0.074
Doctors Office/HMO MRTLSTATUS=2	0.090	0.093
Doctors Office/HMO MRTLSTATUS=3	0.117	0.152
Doctors Office/HMO MRTLSTATUS=4	0.031	0.036

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Doctors Office/HMO	1	134.6953	<.0001
Marginal Marital Status	3	413.6164	<.0001
Doctors Office/HMO*Marital Status	2	1048.7315	<.0001
Not Doctors Office/HMO: Marital Status	1	381.2227	<.0001
Doctors Office/HMO: Marital Status	3	2.0029	0.5718

Table 16.

*Interaction Results for Salt, Employment, and Often Care***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>			
<i>OFTENCARE</i>	<i>Employvar</i>	<i>N Obs</i>	<i>Mean</i>
0	0	35	0.1548690
	1	147	0.0958788
1	0	155	0.0769413
	1	505	0.0703195

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Doctors Office/HMO Not Full Time	0.155	0.154
Not Doctors Office/HMO Full Time	0.096	0.064
Doctors Office/HMO Not Full Time	0.077	0.041
Doctors Office/HMO Full Time	0.070	0.030

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Doctors Office/HMO	1	1.0070	0.3156
Marginal Employment Status	1	0.1863	0.6660
Doctors Office/HMO*Employment Status	1	0.0452	0.8317
Not Doctors Office/HMO: Employment Status	1	0.1172	0.7321
Doctors Office/HMO: Employment Status	1	0.0118	0.9136

Table 17.

*Interaction Results for Exercise, Kids, and Often Care***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>			
<i>OFTENCARE</i>	<i>kids</i>	<i>N Obs</i>	<i>Mean</i>
0	0	149	0.3527496
	1	33	0.2113925
1	0	428	0.2981899
	1	232	0.2970742

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Doctors Office/HMO No Kids	0.353	0.101
Not Doctors Office/HMO Kids	0.212	0.183
Doctors Office/HMO No Kids	0.298	0.043
Doctors Office/HMO Kids	0.297	0.088

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Doctors Office/HMO	1	0.0396	0.8422
Marginal Kids	1	0.2005	0.6543
Doctors Office/HMO*Kids	1	0.3311	0.5650
Not Doctors Office/HMO: Kid	1	0.2728	0.6015
Doctors Office/HMO: Kid	1	0.0002	0.9899



Table 18.

*Interaction Results for Exercise, Marital Status, and Often Care***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>			
<i>OFTENCARE</i>	<i>Mrtlstatus</i>	<i>N Obs</i>	<i>Mean</i>
0	1	48	0.3473620
	2	59	0.5493156
	3	51	0.1452530
	4	24	0.2099089
1	1	194	0.3298314
	2	184	0.2183161
	3	148	0.3623336
	4	134	0.2746191

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Doctors Office/HMO MRTLSTATUS=1	0.347	0.099
Not Doctors Office/HMO MRTLSTATUS=2	0.549	0.189
Not Doctors Office/HMO MRTLSTATUS=3	0.145	0.138
Not Doctors Office/HMO MRTLSTATUS=4	0.210	0.182
Doctors Office/HMO MRTLSTATUS=1	0.330	0.091
Doctors Office/HMO MRTLSTATUS=2	0.218	0.055
Doctors Office/HMO MRTLSTATUS=3	0.362	0.080
Doctors Office/HMO MRTLSTATUS=4	0.275	0.119

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Doctors Office/HMO	1	0.0000	0.9960
Marginal Marital Status	3	0.8151	0.8459
Doctors Office/HMO*Marital Status	3	3.6703	0.2993
Not Doctors Office/HMO: Marital Status	3	1.9831	0.5759
Doctors Office/HMO: Marital Status	3	6.2605	0.0996

Table 19.

*Interaction Results for Exercise, Employment, and Often Care***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>				
<i>OFTENCARE</i>	<i>Employvar</i>	<i>N</i> <i>Obs</i>	<i>Mean</i>	
0	0	35	0.1548690	
	1	147	0.3656145	
1	0	155	0.4148350	
	1	505	0.2612950	

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Doctors Office/HMO Not Full Time	0.155	0.154
Not Doctors Office/HMO Full Time	0.366	0.091
Doctors Office/HMO Not Full Time	0.415	0.075
Doctors Office/HMO Full Time	0.261	0.049

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Doctors Office/HMO	1	0.4081	0.5229
Marginal Employment Status	1	0.1177	0.7316
Doctors Office/HMO*Employment Status	1	1.7988	0.1799
Not Doctors Office/HMO: Employment Status	1	0.7680	0.3808
Doctors Office/HMO: Employment Status	1	5.0697	0.0243

Table 20.

*Interaction Results for Medication, Kids, and Insured***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>			
<i>INSURED</i>	<i>kids</i>	<i>N Obs</i>	<i>Mean</i>
0	0	29	0
	1	47	0
1	0	548	0.0154306
	1	218	0

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Insured No Kids	0.000	0.000
Not Insured Kids	0.000	0.000
Insured No Kids	0.015	0.012
Insured Kids	0.000	0.000

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Insured	1	23.4507	<.0001
Marginal Kids	1	23.7989	<.0001
Insured*Kids	1	24.6817	<.0001
Not Insured: Kid	1	0.0000	1.0000
Insured: Kid	1	472.9805	<.0001

Table 21.

*Interaction Results for Exercise, Kids, and Insured***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>			
<i>INSURED</i>	<i>kids</i>	<i>N Obs</i>	<i>Mean</i>
0	0	29	0
	1	47	0.0499769
1	0	548	0.3268529
	1	218	0.3384494

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Insured No Kids	0.000	0.000
Not Insured Kids	0.050	0.052
Insured No Kids	0.327	0.042
Insured Kids	0.338	0.094

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Insured	1	239.1317	<.0001
Marginal Kids	1	71.6777	<.0001
Insured*Kids	1	145.3336	<.0001
Not Insured: Kid	1	109.2853	<.0001
Insured: Kid	1	0.0135	0.9074

Table 22.

*Interaction Results for Salt, Kids, and Insured***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>			
<i>INSURED</i>	<i>kids</i>	<i>N Obs</i>	<i>Mean</i>
0	0	29	0
	1	47	0.0499769
1	0	548	0.1019883
	1	218	0.0478359

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Insured No Kids	0.000	0.000
Not Insured Kids	0.050	0.052
Insured No Kids	0.102	0.033
Insured Kids	0.048	0.031

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Insured	1	130.0716	<.0001
Marginal Kids	1	84.8958	<.0001
Insured*Kids	1	91.8237	<.0001
Not Insured: Kid	1	137.8240	<.0001
Insured: Kid	1	0.8795	0.3483

Table 23.

*Interaction Results for Medication, Marital Status, and Insured***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>				
<i>INSURED</i>	<i>Mrtlstatus</i>	<i>N Obs</i>	<i>Mean</i>	
0	1	14	0	
	2	21	0	
	3	18	0	
	4	23	0	
1	1	228	0.0259475	
	2	222	0	
	3	181	0.0068356	
	4	135	0	

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Insured MRTLSTATUS=1	0.000	0.000
Not Insured MRTLSTATUS=2	0.000	0.000
Not Insured MRTLSTATUS=3	0.000	0.000
Not Insured MRTLSTATUS=4	0.000	0.000
Insured MRTLSTATUS=1	0.000	0.000
Insured MRTLSTATUS=2	0.000	0.000
Insured MRTLSTATUS=3	0.007	252.7
Insured MRTLSTATUS=4	0.000	0.000

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Insured	1	0.0000	0.9998
Marginal Marital Status	3	1.4140	0.7023
Insured*Marital Status	2	411.1885	<.0001
Not Insured: Marital Status	1	0.0000	1.0000
Insured: Marital Status	3	5.6698	0.1288

Table 24.

*Interaction Results for Exercise, Marital Status, and Insured***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>			
<i>INSURED</i>	<i>Mrtlstatus</i>	<i>N Obs</i>	<i>Mean</i>
0	1	14	0
	2	21	0
	3	18	0.1781342
	4	23	0
1	1	228	0.3509110
	2	222	0.3266490
	3	181	0.3170900
	4	135	0.3177637

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Insured MRTLSTATUS=1	0.000	0.000
Not Insured MRTLSTATUS=2	0.000	0.000
Not Insured MRTLSTATUS=3	0.178	0.172
Not Insured MRTLSTATUS=4	0.000	0.000
Insured MRTLSTATUS=1	0.351	0.077
Insured MRTLSTATUS=2	0.327	0.090
Insured MRTLSTATUS=3	0.317	0.088
Insured MRTLSTATUS=4	0.318	0.129

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Insured	1	1033.1964	<.0001
Marginal Marital Status	3	145.0464	<.0001
Insured*Marital Status	3	113.1313	<.0001
Not Insured: Marital Status	3	150.5953	<.0001
Insured: Marital Status	3	0.1365	0.9871

Table 25.

*Interaction Results for Salt, Marital Status, and Insured***The MEANS Procedure**

<i>Analysis Variable : NonCompliant</i>				
<i>INSURED</i>	<i>Mrtlstatus</i>	<i>N</i> <i>Obs</i>	<i>Mean</i>	
0	1	14	0	
	2	21	0	
	3	18	0.1781342	
	4	23	0	
1	1	228	0.0989682	
	2	222	0.1157737	
	3	181	0.0780148	
	4	135	0.0326648	

<i>Label</i>	<i>Estimate % Not Compliant</i>	<i>Standard Error</i>
Not Insured MRTLSTATUS=1	0.000	0.000
Not Insured MRTLSTATUS=2	0.000	0.000
Not Insured MRTLSTATUS=3	0.178	0.172
Not Insured MRTLSTATUS=4	0.000	0.000
Insured MRTLSTATUS=1	0.099	0.048
Insured MRTLSTATUS=2	0.116	0.063
Insured MRTLSTATUS=3	0.078	0.058
Insured MRTLSTATUS=4	0.033	0.024

<i>Contrast</i>	<i>DF</i>	<i>Wald Chi- Square</i>	<i>Pr &gt; Chi-Square</i>
Marginal Insured	1	512.9129	<.0001
Marginal Marital Status	3	147.1405	<.0001
Insured*Marital Status	3	121.6452	<.0001
Not Insured: Marital Status	3	178.3256	<.0001
Insured: Marital Status	3	2.3014	0.5123



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