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Effects of a racist environment on hypertension: Traditional versus acculturated African Americans

Delia Lucia Lang

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EFFECTS OF A RACIST ENVIRONMENT ON HYPERTENSION:
TRADITIONAL VERSUS ACCULTURATED AFRICAN AMERICANS

A Thesis
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Psychology

by
Delia Lucia Lang
March 1997
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Approved by:

Elizabeth Klonoff, Chair, Psychology
Matt Riggs, Psychology
Hope Landrine, Independent Scholar

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The present study investigated the effects of racism on hypertension among traditional and acculturated African Americans. Specifically, the relationships between skin color and acculturation, acculturation and racism as well as racism and hypertension were investigated. The sample consisted of 141 African American volunteers selected from several Colleges and community groups in the Inland Empire. Results indicate that traditional African Americans are more likely to experience racist events than acculturated African Americans. Factors contributing to this relationship were discussed including the perception of traditional versus acculturated African Americans by the White culture. The relationships between skin color and acculturation as well as racism and hypertension were not supported by the data. Possible explanations for the inconclusive results and suggestions for future research were discussed in terms of sample characteristics.
ACKNOWLEDGMENTS

To Liz ... thank you for the entertainment!
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INTRODUCTION

Between 1988 and 1991, 23.1% of Americans between the ages of 20 and 74 suffered from hypertension. Hypertensives have been defined as either having elevated blood pressure (at least 140 mmHg for systolic pressure and 90 mmHg for diastolic pressure) or taking antihypertensive medication (Health United States, 1995). It has been reported that among hypertensives, approximately 95% suffer from primary or essential hypertension (Berglund et al., 1976), with the remaining suffering from secondary hypertension. The causes of secondary hypertension are known and may be treated in many cases. Among such causes are renal disease, renovascular disease, constriction of the aorta, primary aldosteronism and the use of estrogen for contraception among women. The determinants of essential hypertension are unknown. Generally, it is believed that genetics, obesity, environmental factors as well as a number of pathophysiological mechanisms such as renal and nervous system functioning may be involved (Page, 1960).

Whether or not hypertension can be cured depends on how soon it is diagnosed. Hypertension exhibits symptoms such as headaches, nosebleeds, ringing in the ears, dizziness and fainting. Such symptoms are often also found in normotensive people (Weiss, 1972). Therefore, hypertension is considered to be asymptomatic.
Consequently, unless blood pressure is checked frequently, one may not recognize the disease for 10-12 years, during which time irreversible cardiovascular damage can occur (Kaplan, 1980). Some of the consequences of undetected hypertension are straining of the heart and damage to arteries, deposition of fat and cholesterol on vessel walls leading to hardening of arteries, tissue damage from narrow arteries and decreased blood flow, rupture of blood vessels and escape of blood into other tissue. As a result, if hypertension remains untreated, 50% of hypertensives die of heart disease, 33% of stroke and 10-15% of kidney failure (Kaplan, 1980).

Surveys of blood pressure were originally conducted exclusively in white populations. African American populations began to be surveyed only in the 1930's. Results suggested that African Americans had higher levels of blood pressure than Whites (Adams, 1932). Today these ethnic differences persist. Between 1988 and 1991, 37.2% of Black males and 31.1% of Black females between the ages of 20 and 74 suffer from hypertension compared to 25.3% of White males and 18.3% of White females (Health United States, 1996). Ethnic differences in hypertension have been studied extensively resulting in equivocal findings. Research has focused mainly on biological, nutritional, social, behavioral and psychological issues that may explain ethnic differences in hypertension.
Biological Factors

Research in the area of biology has generally focused on four major factors: genetics, the sympathetic nervous system, kidney functioning (renal activity) and obesity (Anderson, 1989).

Genetic research has shown that blood pressure may be genetically controlled. It has been established that hypertension could be predicted in the offspring depending on the degree of hypertension in the parents (Pickering, 1967; Murphy, 1973 & Havlik et al., 1982). It is unclear to what degree these predictions can be accounted for by genes versus environment. Some studies investigated possible genetic causes of ethnic differences in hypertension by selecting skin color as a genetic marker. Skin pigmentation was measured by the amount of melanin in the skin. A positive correlation between skin color and blood pressure was found among African Americans, indicating that the darker the skin color, the higher the blood pressure (Boyle, 1970; Harburg et al., 1978 & Harburg et al., 1978). However, when further studies controlled for social class, the correlation between skin color and hypertension was only evident in African Americans with a low socioeconomic status (Keil et al., 1977 & Klag et al., 1991). Furthermore, Keil et al. (1981) found that blood pressure was associated with level of education and not skin color. Although genetic factors are important for both African American and White
populations in the development of hypertension, it is yet unclear whether there is one gene or multiple genes that control blood pressure and whether these have a direct or indirect impact on blood pressure. In addition, studies support the notion that there is an interaction between genes and environment in the determination of hypertension (Murray, 1991). Therefore, it is hard to conclude whether genes or environment is more important, and which may contribute most to the existing ethnic differences in hypertension.

Studies of the sympathetic nervous system have indicated that the system's activity is often determined by plasma norepinephrine which has also been implicated in causing high blood pressure (Abboud, 1982). However, ethnic comparison studies have found that African Americans exhibited higher level of blood pressure than Whites, even though both groups maintained a similar level of plasma norepinephrine (Sever et al., 1976). In addition, no plasma norepinephrine differences were found between African American and White hypertensives and among African American hypertensives/normotensives and White normotensives. (Lichtman & Woods, 1967; Sever et al., 1979).

Additionally, heart rate studies indicate that there is a positive association between heart rate and elevated blood pressure. Consequently, it would be expected that African Americans have higher heart rates than Whites; however, for
some age groups, the opposite is true. While African American infants do have faster heart rates than their White counterparts (Schacter et al., 1976), African American children between the ages of 5 and 14 have lower heart rates than Whites (Shekelle, 1978). Even though heart rate differences exist in these age groups, no blood pressure differences were found. In fact, blood pressure is similar in both ethnic groups until adolescence (Schacter et al., 1976; Kotchen et al., 1974).

Kidney functioning has also been linked to long term effects in hypertension. Many areas of renal functioning have been investigated such as sodium excretion, blood volume and plasma renin, to name just a few. Low levels of sodium excretion are known to increase the blood volume and thus contribute to increased blood pressure (Vick, 1984). While Blacks take in less sodium than Whites, they also excrete less, which may be a reason for elevated blood pressure in this group (Anderson et al., 1989). In addition, high levels of plasma renin activity have been linked to increased blood pressure (Gillum, 1979). Conflicting findings on plasma renin activity in these two ethnic groups have been reported. While some studies found no racial differences (Luft et al., 1977), others have (Luft et al., 1982; Hohn et al., 1983). It is beyond the scope of this paper to review this literature in great detail; however, it is important to note that a large number of studies which
have found differences in renin levels and sodium excretion between Blacks and Whites were conducted with hospitalized patients. This poses a problem for the generalizability of such results, as evidenced by studies conducted with subject populations outside the hospital which did not obtain the same findings (Voors et al., 1978).

Finally, another biological factor associated with hypertension is obesity. Research has shown that obesity is positively associated with hypertension in African Americans as well as in Africans (Hypertension Detection and Follow-up Program, 1979; Seftel, 1980). It would then follow that since obesity is a serious problem particularly for African American women, they should exhibit higher levels of blood pressure compared to African American men. However, as noted before, the reverse is the case. This would suggest that factors more significant than obesity determine levels of blood pressure for African Americans. Additional studies suggest that this association between obesity and hypertension in African Americans may have been overemphasized, as this association has been found to be more pronounced among Whites than African Americans (Tyroler, 1975).

**Nutritional Factors**

The implication of nutrition in the question of ethnic differences in hypertension has led to research which has focused on three main nutrients: sodium, potassium and
calcium (Lanford, 1980). High sodium intake and low potassium and calcium intake are associated with high blood pressure. African Americans' low level intake of potassium and calcium has been linked to high levels of blood pressure. Within this ethnic group, sodium consumption is lower than that of Whites indicating that lower levels of blood pressure should be found among African Americans (Frisancho, 1984). At the same time, as noted before, African Americans excrete less sodium, thus adversely impacting blood pressure (Anderson et al, 1989).

While ethnic differences in hypertension may in part be attributed to the biological factors discussed above, it is clear that conflicting findings in this area point to other factors that may have an impact on differences in hypertension. Consequently, in recent years researchers have concentrated more and more on environmental issues while searching to explain ethnic differences in hypertension. In this context, social issues as well as behavioral and psychological factors have been investigated.

**Social Factors**

Among potential social stressors responsible for hypertension, the following have been emphasized: social economic status (SES), ecological and social disorganization, urban-rural differences (including migration) and racism.
Socio Economic Status (SES) has been widely researched and the data indicate that hypertension is more prevalent among both Whites and African Americans with low income, low educational level, poor jobs and so forth (Dyer, 1976; Moss & Scott, 1978; Syme et al., 1974). However, even among the low SES groups, African Americans have been found to have higher blood pressure when compared to Whites in the same SES group. Actually, the overall hypertension rate among African Americans was approximately twice as high compared to Whites, among both uneducated individuals and college graduates. (Hypertension Detection and Follow-Up, 1977).

Additionally, factors such as socioecological stress and social disorganization were investigated. A neighborhood that is both low in SES and high in social instability (high adult/juvenile crime, high divorce rate, high residential transiency rate) is characterized as a socioecological stressful neighborhood. Young African American males were found to exhibit higher levels of hypertension in such neighborhoods but not White males (Harburg et al., 1973). The related concept of social disorganization is defined as a) family instability, b) % of illegitimate births, c) rate of males sentenced to prison, d) % of population separated or divorced, e) % of children under 18 not living with parents. Again results show that highly socially disorganized environments cause added stress for both African American males and females; consequently, they have
a higher stroke mortality rate than their White counterparts (Nesser et al., 1971).

Research on the prevalence of hypertension in urban versus rural communities has generally found higher blood pressure in urban areas compared to rural populations, both in the United States and in less industrialized African nations (Akinkugbe, 1969; Burn et al., 1980; Poulter et al., 1984; M'Buyamba-Kabangu et al., 1987). Conversely Kotchen & Kotchen (1978) have found that when high school students from a rural community in Kentucky were compared to high school students from Washington DC, the former group had higher blood pressure than the latter group. Among African American and White adolescents from integrated urban and suburban schools, urban students showed increased blood pressure compared to their rural counterparts. Again, these differences were manifested more in African Americans than in Whites (Burn et al., 1980). Studies have also investigated rural-to-urban migration in Africa and results have shown an increase in blood pressure of migrants, especially in males (Poulter et al., 1984). Based on these findings it would be expected that all else being equal (1) African Americans living in urban areas of the US would experience similar levels of stress and therefore would have comparable blood pressure to those in urban areas in Africa and (2) African Americans in rural US areas would experience less stressors and therefore have lower blood pressure than
those in urban African areas. However, Akinkugbe (1972) has shown that African Americans overall have higher blood pressure than Africans living in urbanized areas. Thus, while urbanization and the resulting stressors may increase blood pressure in some cases, in other instances it has no effect.

The relationship between stress and essential hypertension has also been greatly investigated. Walter Cannon (1929), among the first to contribute greatly to research in this area, coined the term "fight or flight response". He argued that psychological and/or emotional stress could trigger the arousal of the sympathetic nervous system, which would be the manifestation of stress. He stated that heart rate and respiration changes would prepare an organism for a stress provoking situation by "fight or flight".

The concept of stress has been difficult to operationally define. Due to its vague definition, stress research is viewed with skepticism. Among the many definitions of stress are the following: an environmental event, an appraisal of an environmental event, a response or the appraisal of the event and the interaction between environmental demands and one's ability to meet those demands (Kasl, 1984). Additionally, stress can also be defined in a psychological way to refer to an individual's perception of threats to his/her physical or mental well
being (Lazarus, 1966). A more concise definition was presented by Livingston (1982). He contended that there are two important factors pertaining to the concept of stress: (1) the dynamic interaction between a person and his/her sociocultural environment and (2) the dominance of the sociocultural environment. These two factors are crucial in the realization, interpretation and manifestation of stress. Therefore, the interpretation of stress has to take place within the sociocultural context of the person.

Disregarding the ambiguity about the definition of stress, it is clear that several physiological responses occur in the presence of difficult environmental events. Physiological changes in the metabolic rate, cardiovascular functioning, the autonomic nervous system, heart rate, immune reactions (immunosuppression) and blood pressure have been observed (Mason, 1971; Baum, 1982). Stress studies have indicated that men anticipating the loss of their jobs had high blood pressure. Once they found new jobs, their blood pressure decreased (Kasl et al., 1970). Additionally, it has been shown that a population under constant stress such as air traffic controllers had a higher prevalence of hypertension than other airport employees working under less stressful conditions (Cobb & Rose, 1973). Research has also shown that once a stressor is removed, blood pressure does not remain elevated for prolonged periods of time. Instead, external stressors can increase blood pressure only
for the length of time that the stress stimulus is present (Conference on behavioral medicine and cardiovascular disease, 1987). Similarly, when normotensives, borderline and hypertensives were tested on various types of stresses of different duration and magnitude, no specific stress produced a long lasting increase in blood pressure (Mann, 1986). Thus it appears that an interaction between external stressors and factors such as genetics and obesity may contribute to long term increase in blood pressure followed by hypertension.

The role of racism as an ethnic specific stressor in the prevalence of hypertension has been minimally investigated, although many agree that racism is a significant factor in the lives of minorities, especially African Americans. Racist discrimination can occur in many areas of one's life, and it can take many forms. Some fallacies have been identified at the root of racism (Montague, 1942; Gould, 1981; Mayr, 1982; Lewontin et al., 1984): (1) Human races are divided biologically, (2) Genetic racial differences correlate with other attributes such as intelligence, (3) Some races are biologically as well as culturally superior to other races. Based on these false assumptions, White groups which consider themselves superior, justify acts of oppression and discrimination upon other ethnic groups, especially African Americans.
Discrimination can occur at the institutional or interpersonal level. Institutionalized racism has been defined by Jones (1972) as 1) the deliberate effort of institutions to secure racial discrimination or as 2) practices among institutions resulting in the obstruction of racial groups from choices and access to goods and services. Economically, the effects of institutional racism are often felt by minorities in areas such as employment, education, housing, health and social services to name just a few (Feagin & Feagin, 1978; Feagin, 1991; Rothenberg, 1988). In addition, most minorities are confronted with interpersonal racism on a daily basis (Landrine et al., 1995). This is evident in being wrongly suspected of crimes based solely on the color of one's skin, hate speech, threats of violence, hate crimes and being denied proper service among others (Essed, 1991). It is obvious that incidences of racism are significant stressors for African Americans living in a White society, and in turn, such stressors may adversely affect the prevalence of hypertension in this group.

Nancy Krieger (1990) noted that among African Americans, there was a relationship between experiences of racial and gender discrimination and their responses to these experiences and self reported blood pressure. She found that among 51 African American women, those who did not respond to unfair treatment and who were less likely to remember racial discrimination in their lives, were more
likely to report high blood pressure. Thus, internalizing responses to racial and/or gender discrimination as well as not reporting such experiences, may lead to high blood pressure. These results hold true for African American not White women. Furthermore, it has been reported that when compared with general anger-provoking stimuli, racist incidences have a greater impact on blood pressure (Armstead et al., 1989). This study was also conducted on a small sample (27) in which subjects were asked to watch 3 different film excerpts illustrating a neutral, racist and anger provoking situation. Despite the fact that subjects did not personally experience the situations portrayed in the film excerpts, a clear difference in physiological reaction was evident after viewing the anger provoking versus the racist film.

**Behavioral and Psychological Factors**

In an attempt to define a personality trait or behavioral style that would predict hypertension, research has focused on the association between blood pressure and personality traits. As early as 1939, it was hypothesized that individuals suffering from hypertension are unable to express anger without having feelings of conflict and/or guilt (Alexander, 1939). Subsequent experimental research confirmed Alexander's theory, showing that when frustration is induced, those who are not allowed to vent the frustration have higher blood pressure than those who can
release that frustration (Hokansen et al., 1963). In addition, high levels of blood pressure were also associated with a high need for social approval (Fishman, 1965). In fact, hypertensives have been found to be socially incompetent compared to normotensives in that hypertensives are less likely to talk about themselves and disclose themselves to others (Williams et al., 1972).

Perhaps one of the most frequently studied personality traits in association with coronary disease is type A behavior. Friedman and Rosenmann (1959) described it as a reaction style characterized by time urgency, competitiveness, work involvement, striving for achievement and muscle tension. Results on the relationship between type A behavior and blood pressure are unclear. Some surveys have found no relationship between the two variables (Shekelle et al., 1976), while more recent findings have shown that a combination of introversion, Type A behavior and high frequency of socially desirable responses is associated with elevated blood pressure (Drummond, 1982).

There is no evidence yet suggesting the existence of a personality trait that would predict hypertension. Consequently, research began in the areas of hostility and coping mechanisms. Generally, results indicate that individuals who hold in anger and hostility when provoked are more likely to have higher blood pressure as opposed to individuals who cope with anger and hostility in an
expressive manner (Gentry et al., 1982). While these findings hold true for both White and African American individuals, higher blood pressure is reported to occur sooner in African American males and females than in Whites (Johnson et al., 1987). Conversely, results reported by Dimsdale et al. (1986) indicated that among a sample of African American and White middle-aged subjects, blood pressure increased with suppressed hostility only in White men but not in African American men or in women of either race. Additionally, Johnson & Broman (1987) found that expressed anger towards an angry boss was associated with higher blood pressure in African Americans when compared to individuals who suppressed their anger or had a more reflecting coping style. This was true for African American subjects between the ages of 25 and 39 who were unemployed, single and had less than a high school education. These findings indicate that suppressed hostility alone does not necessarily predict hypertension in either race.

John Henryism is another coping style that has been largely investigated regarding its connection to the prevalence of hypertension in Blacks (James, 1983). This coping style received its name from a hard working, African American folk hero who was determined to succeed despite his odds. Thus, the "John Henryism" coping style describes a person who possesses a great deal of determination for success, and at the same time has very limited resources
available to actually succeed (i.e. low SES, limited education etc.). Under such conditions, the autonomic nervous system may be highly aroused, thus initiating higher blood pressure and possibly essential hypertension. Studies conducted with African Americans showed that highest blood pressure was found in those who had little education and scored highest on the John Henryism coping style, in other words, those who tried hardest to beat the odds (James et al., 1984; James et al., 1987).

The relationship between acculturation and blood pressure has also been investigated, since acculturation can be a great stressor unique to minorities living in a White culture. The concept of acculturation refers to the process in which individuals gradually change the traditions, beliefs, values and practices of their culture and adopt those of the dominant culture (Olmeda, 1979; Landrine & Klonoff, 1996). Landrine & Klonoff view acculturation on a continuum. Traditional individuals are at the one extreme. Usually they do not speak the language of the dominant culture and are involved in their own cultural traditions, beliefs, and practices. At the other extreme are the acculturated individuals. Usually they speak the language of the dominant culture, and they have little or no ability to speak the language of their origin. These people are mostly involved in the traditions, beliefs and practices of the dominant culture. Inbetween the two extremes are bicultural
individuals who generally speak both the language of the dominant culture and the language or their origin. They also participate in both the dominant and the original cultural traditions, beliefs and practices.

Several studies have looked at the relationship between degrees of acculturation and health issues such as obesity, diabetes, mortality, and hypertension (Hazuda et al., 1988; Burnam, et al., 1987). Hypertension and acculturation have been linked in several minority groups such as Polynesians (Joseph et al., 1983; Salmond et al., 1989), Navajo Indians (Kunitz & Levy, 1986) Chileans (Cruz-Coke, 1987) and Mexican Americans (Espino & Maldonado, 1990). Predominantly, these studies have looked at the relocation of recent migrants from their countries of origin to new societies or at the acculturation of migrants from rural areas to urban areas of their own country. Findings have shown an increase in the prevalence of hypertension in migrants versus nonmigrants. An evident absence of studies exists concerning the association between acculturation of African Americans to the White society and health issues.

Recently, one study has found that traditional African Americans who adhere to their cultural norms while living in a White society experience more racism than acculturated African Americans who have adopted the norm of the White culture (Landrine & Klonoff, 1995a). This may be due to a greater similarity in cultural norms between acculturated
African Americans and Whites leading to greater acceptance by the White culture. Conversely, very dissimilar cultural norms between traditional African Americans and Whites may lead to rejection of that group by the White culture. As a result, traditional African Americans who experience more racism are more prone to increased blood pressure as was discussed before (Armstead et al., 1989; Krieger, 1990). This suggests that acculturation is associated with blood pressure, but only through the effects of racism. (Landrine & Klonoff, 1996).

Skin color seems to play an important role in the experience of racism. Allport (1954) commented that judgements about other people are made based on visible differences. Consequently, in White societies, the group membership and social status of an individual have often been decided based on skin color. Thus, darker skinned African Americans have suffered more racism than their lighter skinned counterparts. Landrine & Klonoff (1996) suggest that darker skinned African Americans may be seen as more different from the White culture than lighter skinned African Americans. Conversely, light skinned African Americans may be viewed as similar to the White culture which could facilitate their acculturation. Results supporting this idea have shown that dark and medium skinned African Americans were more traditional than light skinned African Americans. However, it was the degree of
acculturation that directly resulted in different experiences of racism. Skin color was only indirectly related to racism as it may have been related to level of acculturation. (Landrine & Klonoff, 1996).

In conclusion, it is clear from the literature reviewed above that biological factors are not the sole contributors to the observed ethnic differences in hypertension. As the biomedical model has not been able to provide solutions for this health problem, other research has indicated that it is time to consider not only biology but also environmental factors surrounding African Americans daily. As such, the interaction of this ethnic group with its sociopsychocultural environment is investigated. Since it appears that the risk of hypertension for African Americans is higher due to their interaction with a racist environment it is hypothesized that: (1) darker skinned African Americans will be less acculturated than lighter skinned African Americans, (2) traditional African Americans will experience more racism than acculturated African Americans and (3) African Americans who experience more racism will have higher blood pressure than those who experience less racism.

METHOD

Participants

One hundred forty one African-American volunteers were asked to participate in this study. The sample included 26
males and 115 females ranging from 18 to 67 years in age (mean = 32.78 and standard deviation = 11.59). The educational level among participants was divided among 8 participants having no high school education, 39 having completed less than four years of college, 31 having graduated from a 4 year college, 23 who have a Master's Degree and 5 who have a graduate school education. The mean income ranged from 0 to $730,000 per year with a mean of $15,000 and a standard deviation of $68,074. Among the 141 participants, 19 indicated that they were smokers and 100 indicated to be non smokers. Finally, perceived skin color was rated as follows: 10-very light skinned, 23-light skinned, 74-medium skinned, 25-dark skinned and 8-very dark skinned.

Volunteers received a free blood pressure reading for their participation. Additionally, based on previous research findings indicating that a $1 incentive increases response rate by approximately 12% (Yammarino et al., 1991), participants also received $1 for their participation. Volunteers were treated in accordance with the "Ethical Principles of Psychologists and Code of Conduct" (American Psychological Association, 1992).

Procedure

Volunteers were approached by a research assistant on college campuses, at airports, malls, community groups and social service departments in the Inland Empire. Their blood
pressure was recorded, and they were asked to complete 4 questionnaires.

Materials

Systolic and diastolic blood pressure was taken with an automatic oscillometric digital blood pressure monitor (Moron HEM-707). The reliability of this instrument was tested against readings from conventional sphygmomanometer measures taken by a trained RN on a small number of subjects prior to the start of the study.

A battery of questionnaires consisting of four measures was administered. First, the African-American Acculturation Scale (AAAS) was used (Landrine & Klonoff, 1995b). This is a 74 item measure assessing the degree of acculturation of African-Americans to the White culture on 8 specific subscales. Participants respond to all items on a 7-point Likert scale ranging from 1 (totally disagree/not true at all) to 7 (I strongly agree/absolutely true). Each participant receives one score by summing the scores on all 74 items. Sample items are (#31) "Sometimes I cook ham hocks"; (#11) "It's best for infants to sleep with their mothers". The split-half reliability on the 74 items is r=.93. The Chronbach’s alpha results for each of the 8 subscales are as follows: 1) preference for African American things (11 items), .9020; 2) family practices and values (12 items), .7007; 3) health beliefs, practices and folk disorders (12 items), .7814; 4) socialization (11 items),
.7814; 5) foods and food practices (10 items), .8168; 6) religious beliefs and practices (6 items), .7555; 7) interracial attitudes (7 items), .7870; and 8) superstitions (5 items); .7235. The criterion-related validity was determined by comparing responses of African Americans and non African Americans on this scale. An ANOVA showed that the two group means were significantly different (t=13.03; p=.0001), indicating that the AAAS differentiated between African Americans and non African Americans.

The second measure used was the Schedule of Racist Events, consisting of 18 items and measuring the frequency with which African Americans experience certain types of racial discrimination (Landrine & Klonoff, 1996). Three subscales are assessed with this measure: a) racist events experienced during the past year (RE Year), b) racist events experienced during one's lifetime (RE Life) and c) appraisal of the stressfulness of the racist events experienced (RE Appraisal). Participants respond on a 6-point Likert scale ranging from 1 (this has never happened) to 6 (this has happened almost all of the time - more than 70% of the time). Three responses are required for each of the 18 items: first, for how often an event happened in their entire lifetime; second, for how often that event happened in the past year; third, for how stressful that event was for the participant. By summing the responses to the 18 items for each of the three questions, each participant
receives 3 scores. Sample items are (#12) "How many times did you want to tell someone off for being racist but didn't say anything?" or (#7) "How many times have you been treated unfairly by neighbors because you are Black?". The internal consistency reliability for each of the subscales (RE Year, RE Life and RE Appraisal) resulted in coefficients of .95, .95 and .94 respectively.

The third measure used was the PERI-Life Events Scale (PERI-LES) (Dohrenwend et al., 1978) consisting of 102 items and measuring general life hassles. Participants respond to each item twice: once for their experience of that event during the past year, and once for the past 3 months. The scores for each of the two time periods are summed up separately. Thus, each participant receives 2 scores. Sample items are (#33) "Married couple separated"; (#46) "Child died"; (#59) "Built a home or had one built".

The fourth questionnaire included items used to determine blood pressure history as well as its present status, smoking habits, height, weight, age, education and income of volunteers. These items were selected from the National Health Interview Survey. Participants were also asked to rate the color of their skin. This item was answered on a Likert type scale ranging from 1 (very light skinned) to 5 (very dark skinned).
RESULTS

Prior to analyzing the data, accuracy of data entry, missing values, outliers as well as the assumptions of normality, homogeneity of variance and linearity were examined for the following variables: systolic/diastolic blood pressure, total acculturation score and experiences of racism (lifetime, year and appraisal). All analyses were performed on SPSS. No outliers were found to be extreme enough to justify their exclusion. For each analysis, missing data was deleted pairwise to minimize the loss of cases. As evidenced by frequency histograms and box plots, most variables appear to be approximately normally distributed. Responses to the frequency of racist events during the past year are slightly positively skewed but not enough to warrant a transformation of that variable. Additionally, a ceiling effect is observed for RE Appraisal indicating an increase in response scores toward the high end of the distribution. The assumption of homogeneity of variance can be examined by looking at the standard deviation of each variable for each group. Results indicate that the variance of all variables is approximately equally spread around the means for the different groups. Finally, the assumption of linearity appears to be met as evidenced by scatterplots showing linear relationships among all pertinent variables.
To test the comparability of the sample statistics to the population parameters, two independent t-tests were conducted including gender and age as grouping variables and blood pressure, experiences of racism (RE Life, RE Year and RE Appraisal) and acculturation as dependent variables. Significant gender differences were found with respect to systolic blood pressure only ($t = -2.08; df(139); p = .04$). Males had higher systolic blood pressure ($\text{mean}=133.58; \text{sd}=10.11$) than females ($\text{mean}=125.25; \text{sd}=12.26$). Mean differences for diastolic blood pressure, acculturation and racism scores were in the expected direction, however, they were not significant. The second t-test examined differences in blood pressure, experiences of racism and acculturation between two age groups: younger than 34 and older than 35 years. Significant age differences were found with respect to diastolic blood pressure ($t = -3.23; df(137); p = .002$), systolic blood pressure ($t = -2.80; df(137); p = .006$), RE Appraisal ($t = -2.72; df(130); p = .007$), RE Life ($t = -2.64; df(129); p = .009$) and acculturation ($t = -3.21; df(135); p = .002$). Young participants had lower systolic and diastolic blood pressure ($\text{mean systolic}= 123.2; \text{mean diastolic}= 78.21$) compared to older participants ($\text{mean systolic}= 132.11; \text{mean diastolic}= 84.69$). Similarly, African Americans under the age of 34 also scored significantly lower on RE Life and RE Appraisal ($\text{mean RE Life}= 50.03; \text{mean RE Appraisal}= 51.30$) compared to those over the age of 35 ($\text{mean RE Life}= 58.40$;
mean RE Appraisal= 61.45). Finally, young African Americans appeared to be more acculturated (mean= 307.51) than their older counterparts (mean= 343.93) as indicated by their acculturation scores.

To test the first hypothesis stating that darker skinned African Americans would be less acculturated than lighter skinned African Americans, a Spearman rank order correlation was performed. This is a nonparametric analysis equivalent to the Pearson correlation except that it is based on ranks rather than actual values of the data. Results indicate that the relationship between the two variables is not significant (r= - .0512, p=.551).

To test the second hypothesis stating that traditional African Americans experience more racism than acculturated African Americans, a Pearson correlation was performed. Results indicate that there is a significant, positive correlation between the acculturation measure and racism during the past year (RE Year) (r=.2590, p=.002) as well as racism throughout one’s lifetime (RE Life) (r=.1839, p=.036). No significant relationship was found between level of acculturation and appraisal of racist events (RE Appraisal) (r=.1485, p=.089). Results are illustrated in Table 1.

Furthermore, the hypothesis that African Americans who experience more racism will have higher blood pressure compared to those who experience less racism was tested. Two
blood pressure measures were collected in this study. First, a self-report measure was obtained based on participants’ responses to the question "Have you ever been told by a doctor or other health professional that you had hypertension, sometimes called high blood pressure?". Twenty-eight participants responded "Yes" and 98 responded "No". Second, an objective blood pressure measure was taken with an automatic blood pressure monitor. Given the nature of these measures, a MANOVA was performed to identify the relationship between self-reported blood pressure and experiences of racism, and two Pearson correlations were used to examine the relationship between measured systolic and diastolic blood pressure and experiences of racism. In the MANOVA, the self-report measure of blood pressure was used as the grouping variable with the three racism scores as the dependent variables. Results indicate no significant differences in racism scores between the two groups (Hotellings $T^2 = .04$; Exact $F(3,110) = 1.482$; $p = .223$; effect size = .039; power = .38) (Table 2). As presented in Table 1, the results of the first Pearson correlation indicate no significant relationships between systolic blood pressure and experiences of racism (RE Year: $r = .0920$, $p = .280$; RE Life: $r = .1637$, $p = .061$; RE Appraisal: $r = .0688$, $p = .430$). Similarly, the second Pearson correlation indicates no significant relationships between diastolic blood pressure and experiences of racism (RE Year: $r = .0753$, $p = .376$; RE

Replication of results obtained in the original study using self reported blood pressure levels and the same acculturation and racism scales was not achieved (Landrine & Klonoff, 1996). Due to the powerful results obtained by the authors in that study, frequency comparisons were made to determine the comparability of the current sample with that obtained in the previous study. A brief contrast of variables including demographics is presented in Table 3.

Additional tests were performed to examine the replicability of the original results with respect to smokers and non smokers and their experiences of racism as well as their level of acculturation. Results have previously indicated that smokers and non smokers score differently on RE Life and RE Appraisal. Smokers and non smokers were determined based on responses to the question "Do you smoke cigarettes now?". There were 100 smokers and 19 non smokers. Smoking versus non smoking was used as the grouping variable with the three racism scores as the dependent variables. Results of the MANOVA suggest that there were no significant differences in racism scores between smokers and non smokers (Hotellings T^2=.042; Exact F(3,110)=1.542; p=.208; effect size=.040; power=.40).

Results are illustrated in Table 4. In addition, a one way ANOVA was performed to test the level of acculturation between smokers and non smokers. Results suggest that there
were no differences in acculturation scores between smokers and non smokers (F(1,115)=2.280; p=.134; effect size=.019; power=.322). This result replicates findings in the original study in which acculturation did not predict membership to the smokers or non smokers group.

**DISCUSSION**

The 3 hypotheses of this study were only partially supported by the data. With respect to the first hypothesis, no conclusive statements can be made about the relationship between skin color and acculturation. The second hypothesis was partially supported suggesting that more traditional African Americans, are more likely to experience more racist events during the past year as well as during their entire lifetime. No conclusions can be drawn regarding the level of stress with which African Americans appraise such racist events. Finally, the last hypothesis was not supported; therefore, no conclusive statements can be made about the relationship between experiences of racism and blood pressure.

Due to the limited number of participants (N=141), this study lacked the statistical power necessary to obtain stronger results. The power ranged between .172 to .44. This indicates that for all analyses performed, the likelihood of detecting significant differences between the groups was below 50%. A minimum of 220 participants would have been needed to obtain a power of .80.
Having an insufficient number of participants may have affected the distribution and the range of variability on most variables. As such, 7.1%, 16.3%, 52.5%, 17.7% and 5.7% of participants rated themselves as being very light skinned, light skinned, medium skinned, dark skinned and very dark skinned respectively. The limited data available on both light and dark skinned African Americans may have contributed to the lack of significant results obtained with regards to levels of acculturation among the three skin color groups (Hypothesis 1).

With respect to the second hypothesis investigating experiences of racism in relation to acculturation, current results confirm previous findings (Landrine & Klonoff, 1995a) indicating that the more traditional African American individuals are, the more likely they are to experience an increased number of racist events. Conversely, individuals who are acculturated are likely to experience less racist events. This relationship may be explained by studying the way in which African Americans are perceived by Whites. African Americans adhering to traditional cultural beliefs could be viewed as very different than their acculturated counterparts. As such, rejection as well as racial discrimination by White society could be more evident among traditional than acculturated African Americans. Future research is needed to examine these processes.
The lack of support for the third hypothesis investigating the relationship between experiences of racism and blood pressure may also be attributed to small sample size. Specifically, the gender distribution in this sample was highly skewed with 82% females and 18% males. The lack of male representation in this study may have contributed to the non significant results by narrowing the mean differences in blood pressure found in the population between males and females. While male blood pressure measures (mean systolic=133.58, sd=10.11; mean diastolic=82.54, sd=12.97) were slightly higher than those of females (mean systolic=125.25, sd=12.26; mean diastolic=80.48; sd=19.46), they did not sufficiently increase the gender variation in blood pressure. Therefore, gender differences in blood pressure were obtained for the systolic measure only. Furthermore, a larger sample of both males and females would have been needed to allow for better comparisons between blood pressure and experiences of racism at various levels of blood pressure (Hypothesis 3). In the current sample, 14.4% of females and 21.2% of males suffered from high blood pressure compared to 31.1% and 37.2% in the US population respectively.

Additionally, the present study did not obtain information on how participants deal with experiences of racism. Previous studies have shown that the relationship between experiences of racism and level of blood pressure
may depend on whether the individual accepts the incidences as a fact of life, tries to do something about the incident, talks to other people about what happened or does not talk to others (Krieger & Sidney, 1996). Krieger and Sidney's findings were that among working class individuals who reported racist experiences, accepted them as a fact of life and did not talk to other people about them had higher systolic blood pressure compared to those who reported racist experiences, tried to do something and talked to others about them. In addition, when individuals who reported no experiences of racism were compared to those who reported such incidences, the former group had higher blood pressure. Among professional individuals results were different. Attempting to do something about a racist event and NOT talking to others resulted in lower blood pressure. Similarly, those who reported no racist incidences had lower blood pressure. It is evident that identifying the coping patterns of African Americans with respect to experiences of racism is important, and such information should be collected in future studies.

Based on the current study, no conclusive statements can be made about the associations between skin color and acculturation nor between experiences of racism and hypertension. However, upon examination of the group means in the analyses reported above, the hypothesized trends among these variables are indeed evident. Future studies
should attempt to maximize their power by collecting a sufficiently large sample. In doing so, the sample is more likely to be representative of the population and to provide the variation necessary for meaningful comparisons. The importance of studying the contribution of ethnicity as it relates to experiences of racism and ultimately to issues of physical health becomes more evident with the realization that explanations for health and illness often lie beyond the biological model.
### Table 1.
**Correlation Matrix**

<table>
<thead>
<tr>
<th></th>
<th>RE_YEAR</th>
<th>RE_LIFE</th>
<th>RE_APP</th>
<th>SYSTOLIC</th>
<th>DIASTOLIC</th>
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<td>(130)</td>
<td>(132)</td>
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<td>(139)</td>
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<tr>
<td></td>
<td>p=.002</td>
<td>p=.036</td>
<td>p=.089</td>
<td>p=.533</td>
<td>p=.457</td>
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</tr>
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<td></td>
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<td>.6683</td>
<td>.0920</td>
<td>.0753</td>
<td></td>
</tr>
<tr>
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<td>(132)</td>
<td>(133)</td>
<td>(140)</td>
<td>(140)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p=.000</td>
<td>p=.000</td>
<td>p=.280</td>
<td>p=.376</td>
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<td><strong>RE_LIFE</strong></td>
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<td>(131)</td>
<td>(132)</td>
<td>(132)</td>
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</tr>
<tr>
<td></td>
<td>p=.000</td>
<td>p=.061</td>
<td>p=.232</td>
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<td>(134)</td>
<td>(134)</td>
<td></td>
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<td>p=.430</td>
<td>p=.729</td>
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<tr>
<td><strong>SYSTOLIC</strong></td>
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<td>.6913</td>
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<td>(141)</td>
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Table 2.
Demographic comparison: present and original study (Landrine & Klonoff, 1995a)

<table>
<thead>
<tr>
<th>DEMOGRAPHICS</th>
<th>ORIGINAL STUDY</th>
<th>PRESENT STUDY</th>
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<tbody>
<tr>
<td></td>
<td>N</td>
<td>MEAN</td>
</tr>
<tr>
<td>Sample Size</td>
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<tr>
<td>Men</td>
<td>66</td>
<td>-</td>
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<tr>
<td>Women</td>
<td>83</td>
<td>-</td>
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<td>Age</td>
<td>- 30.14</td>
<td>11.66</td>
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<td>Income/year</td>
<td>- $21,451</td>
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Table 3.
Comparing Smokers and Non Smokers on the Schedule of racist Events

MANOVA

Hotellings $T^2 = .042$  Exact $F = 1.54$  DF = 3,110,  $p = .208$

UNIVARIATE F-TESTS

<table>
<thead>
<tr>
<th>Racist Events Scale</th>
<th>Smokers (n=19) Mean</th>
<th>Non Smokers (n=100) Mean</th>
<th>$F$</th>
<th>Effect Size</th>
<th>Power</th>
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<tr>
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<td>43.08</td>
<td>4.66</td>
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<td>.569</td>
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<td>SRE Life</td>
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<td>52.10</td>
<td>3.56</td>
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<td>54.07</td>
<td>2.49</td>
<td>.022</td>
<td>.347</td>
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</tbody>
</table>
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