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**PSYCHOLOGICAL DISTRESS, AFRICAN AMERICAN ACCULTURATION
AND FAMILY HISTORY OF BREAST CANCER: EFFECTS ON BREAST
SELF-EXAMINATION FREQUENCY**

by

Josephine S. Guevarra

**A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of
the requirements for the degree of Doctor of Philosophy, The City University of New
York**

2000

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PSYCHOLOGICAL DISTRESS, AFRICAN AMERICAN ACCULTURATION AND
FAMILY HISTORY OF BREAST CANCER: EFFECTS ON BREAST SELF-
EXAMINATION FREQUENCY

BY

Josephine S. Guevarra

Adviser: Professor Suzanne Ouellette

Abstract Breast cancer is the most common type of cancer among women. Black women exhibit a lower breast cancer incidence than White women, but their breast cancer mortality is higher. Causes for the racial difference are not known, but the higher breast cancer mortality has been linked to diagnosis at later stages of disease. A possible contributing factor to later stage at breast cancer diagnosis is inappropriate breast cancer screening. Adherence to appropriate breast cancer screening is especially important for women with family histories of breast cancer (FH+) as they are at increased risk for developing breast cancer and have been found to have a higher perception of personal risk for developing the disease and greater psychological distress, both have been linked to inappropriate screening. Evidence from studies with Hispanic women suggests also that level of acculturation plays a role in breast cancer screening. It was hypothesized that psychological factors and acculturation impacts on breast cancer screening. BSE frequency was selected as the breast cancer screening behavior as it is a low-cost behavior that has been found to increase the likelihood of detecting early breast tumors.

The study was done in two parts. The first part compared Black women *with* a first-degree relative with breast cancer (FH+) to Black women *without* a first-degree

relative with breast cancer (FH-) on measures of perception of risk, psychological distress (general, cancer-specific and BSE-specific) and breast self-examination (BSE) frequency (N=100). The Groups differed on perception of risk, BSE-specific distress and short-term BSE frequency. BSE-specific distress mediated the relationship between family history of breast cancer and BSE frequency. When the FH+ and FH- Groups were combined, avoidance and intrusive thoughts were found to be related to BSE frequency. The second part of the study examined the effects African American acculturation on psychological distress and BSE frequency among a sub-sample (N=67). Only the Preference for African American Things and Interracial Attitude sub-scales were related to BSE frequency. These sub-scales were unrelated to general or cancer-specific distress. The utility of African American acculturation in understanding BSE frequency and implications for breast cancer screening interventions are discussed.

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Introduction

Cancer is the second leading cause of death in the United States exceeded only by heart disease (American Cancer Society, 1997). Approximately 70% of all female cancer can be accounted for by breast, colon/rectum, lung, and uterine (gynecological) cancers (Andersen, 1998). Breast cancer accounts for approximately 32% of all cancer in women and is a leading "cancer-killer" of women (Andersen, 1998). Breast cancer incidence has steadily increased about 2% a year since 1980 (Andersen, 1998). In 1999, more than 175,000 new cases of breast cancer will be diagnosed and over 43,000 women will die of the disease (American Cancer Society, 1999).

The two most important risk factors for developing breast cancer are age (American Cancer Society, 1996) and having family history of breast cancer (Hulka, 1996). For example, the risk of developing breast cancer for a 20-year-old woman is one in 2,500; for a 60-year-old woman the risk increases to one in 29 (American Cancer Society, 1996). While the breast cancer lifetime risk for the average American woman without family history of breast cancer is 11%, the lifetime risk of developing breast cancer for a woman with a mother and sister diagnosed with pre-menopausal breast cancer is about 35% (Claus et al., 1994). For women with family histories of breast cancer, risk increases 1) when an affected individual is diagnosed at a younger age; 2) additional family members are diagnosed with breast cancer; and 3) there are diagnoses of bilateral breast cancer in the first-degree relatives (Hulka, 1996).

In the Black community breast cancer has had a substantial impact. Though Black women are diagnosed with breast cancer slightly less often than White women,

their five-year survival rate is significantly lower (Moormeir, 1996). Major factors cited as contributing to the higher breast cancer mortality among Black women include differences in breast cancer screening behavior, presentation at later stages of disease, and lower socioeconomic status (Bagley-Burnett et al., 1995; Bain et al., 1986; Bassett & Krieger, 1986; Dayal et al., 1982; Freeman, 1989; Freeman & Wasife, 1989; Gordon et al., 1992; Long, 1993; Vernon et al., 1985). Recent studies agree that socioeconomic status alone is not sufficient to explain the effect of race on breast cancer stage or survival rates (Eley et al., 1994; Lannin et al., 1998). Other less studied possible contributing factors are perceptions of personal risk, psychological distress, screening differences and level of acculturation.

The review that precedes the study describes commonly cited factors associated with Black and White breast cancer incidence and survival differences, followed by a review of the sparse literature on how acculturation affects breast cancer screening, and concludes with evidence suggesting that the psychological distress associated with having a family history of breast cancer impacts on screening. References to White women will be used as a guide. From the data included in this study, questions of how the Black women in this sample compare to White women in the general population, or to Black women in the general population, can only be speculated upon.

Differences in breast cancer incidence and survival

In 1986, the American Cancer Society reported that over the prior thirty years cancer incidence rose by 12% for Whites, but rose by 27% for Blacks. During the same period, cancer mortality increased 40% in Blacks and only 10% in Whites (American

Cancer Society, 1986).

Breast cancer mortality follows a slightly different pattern. Breast cancer incidence is higher among White women than minorities. However once diagnosed, the mortality rate is higher for Black than for White women (Lannin et al., 1998; American Cancer Society, 1997). For example, the five-year breast cancer survival rate from 1981 to 1986 was 76% for White women and only 63% for African-American (Long, 1993). The higher rate of breast cancer among White women may be shifting. A recent study conducted over a 10-year period in three metropolitan areas found that in some parts of the country (Los Angeles, Nashville and Atlanta), the breast cancer incidence rate for Black women to be 35.3% versus 31.8% for White women (Wu et al., 1998). The researchers conclude that if the differential rate of increase continue, the annual age-adjusted incidence for Black women will surpass that among White women. As incidence rise, we can expect mortality rate to also rise. They suggest a continuing need to develop and then implement culturally sensitive interventions targeted at the Black population (Wu et al., 1998).

Four major clinical factors have been cited as contributing to the higher breast cancer mortality among Black women. They are: 1) genetic differences; 2) biological and constitutional characteristics; 3) treatment differences; 4) advanced stages of disease at diagnosis and socioeconomic status (Bailey, 1987; Long, 1993). Clearly, some of the factors are more interrelated than others. For example, a woman of a lower socioeconomic status (SES) may receive a different treatment regime than a woman of a higher SES, but that does not account for possible differences in biological

characteristics. Except in the last category where I combine the two, there was enough evidence in the literature to suggest that these factors can be examined separately.

Genetic differences

Genetically, American Blacks represent a biracial hybrid population that arose by admixture from Sub-Saharan African and European sources (Leffall, 1981). Due to racial admixture, finding a genetic difference between American Blacks and American Whites may be extremely difficult as some Blacks are more similar to some Whites than they are to other Blacks. In various parts of the United States the admixture ranges from three to 26 percent.

Petrakis (1971) examined this problem from an interesting angle. Based upon the presence of the Duffy gene which is absent in Black Africans and has a high incidence in Caucasian Americans, he found a consistent association between the incidence of breast cancer and the extent of Caucasian admixtures in Duffy gene exposure. This association was not found for other cancers.

Another approach has been to examine the pattern of p53 gene mutations. The p53 mutation occurs in aggressive breast cancer and may contribute to the observed racial difference in breast cancer survival (Shiao et al., 1995). According to Mazars et al. (1992), there is evidence linking the development and progression of cancer to an accumulation of mutations at the genomic level. Mutations are thought to result either in the activation of protooncogenes or in the loss of tumor suppressor (Mazars et al., 1992). Originally thought of as an oncogene --a gene that causes the formation of tumors--it was only recently discovered that the p53 gene in fact possessed tumor suppressing potential

(Mazars et al., 1992). "A mutation affecting the coding sequence of the p53 gene consequently leads to the loss of its negative growth control properties or event to its oncogenic activation" (Mazars et al., 1992), p. 3918, 1992) Patterns of an altered p53 gene might eventually become useful as an epidemiological tool because the gene is often altered in all human cancers and reflects the effects of specific carcinogens in the development of certain cancers (Blayzk et al., 1994). Important to breast cancer research is that a mutation inactivating the tumor suppressing potential of the p53 gene has been identified in sporadic breast cancer (Blayzk et al., 1994). Black women with the genetic mutation die more often than White women with the mutation.

In one study, the researchers examined patterns of the p53 mutation in 47 Black women from Detroit. They chose Detroit because Michigan had the highest average annual age-adjusted mortality in the US for 1984-88 (Blayzk et al., 1994). They found a threefold excess of the mutation. Though they had no evidence to support a particular mechanism for the patterns, they suggest that future research test hypotheses which examine how bio-regulatory molecules, nitric oxide, and other types of nitrites might contribute to the p53 observed patterns. Nitric oxide is of special interest since it is a component of cigarette smoke and an air pollutant (Blayzk et al., 1994).

In another study, Shiao et al. (1995), examined survival and p53 patterns of 209 Black and White women diagnosed histologically with stage I and II breast adenocarcinoma. The researchers hypothesized that racial survival differences might be due to p53 gene alterations. Among the Black women studied in their sample, they found that 55.6% of the cases with p53 gene alterations died of breast cancer during the study

period, compared to only 11.1% of the Black patients without the p53 gene alterations. For Whites, they found 11.1% with the mutation died and 18.4% without the mutation died. They suggest a 4-5 fold excess risk of death from breast cancer for Black women with the mutation. Importantly, a p53 mutation was not found significantly more often in Black than in White women (20.0% versus 19.2%).

This area of research is extremely exciting and speaks to the need for Black women with breast cancer to be tested for a p53 mutation. Though eventually testing for a p53 mutation might alter the future of treating Black women with certain types of breast cancer--which is somewhat an "after the fact" consideration-- the future of genetic testing in breast cancer research is headed toward "before the fact" awareness--testing for inherited susceptibility to breast cancer. Genetic studies in this area have identified the BRCA1 and BRCA2 genes.

Epidemiologic and anecdotal reports of families with many affected members have long suggested an inherited genetic susceptibility to breast cancer. While sporadic breast cancer is the most common type of breast cancer, hereditary breast cancer accounts for 10-14% of all breast cancer cases (Borresen, 1992). The gene responsible for an early onset familial breast and ovary cancer has been mapped to chromosome 17q21 (Borresen, 1992). It is estimated that women who carry a BRCA1 genetic mutation have an 86% lifetime risk of developing breast cancer, a 59% risk by age 50, and between a 25% to 85% lifetime risk of developing ovarian cancer (Offit & Brown, 1994). Though only about one in 300 women carries inherited mutations of breast cancer susceptibility genes (National Institutes of Health, 1995), up to 40% of breast cancers presenting before the

age of 30, and most instances of breast/ovarian cancer syndrome, are associated with abnormalities of the BRCA1 gene (Ford et al., 1994; Easton et al., 1993; Biesecker et al., 1993). Another breast cancer susceptibility gene, BRCA2, has also been identified (Wooster et al., 1995). According to Gayther et al., (1997), germline mutations of BRCA2 account for about 35% of families with multiple case, early onset female cancer, and with an increased risk of male breast cancer, ovarian cancer, prostate cancer and pancreatic cancer.

There is evidence that the mutation may vary in different ethnic groups (Trock, 1996). For example, the carrier frequency of specific BRCA1 mutations have been found to be significantly higher in Ashkenazi Jewish women than in the general population (Struwing et al., 1995). At this paper's writing, there is no evidence that Black women express BRCA1 or BRCA2 mutation at greater or lesser frequency than White women (Amos et al., 1991). Widespread testing for BRCA1 and BRCA2, however, may be a long way off -- especially for low-income Black women. Two recent studies (Newman et al., 1998; Malone et al., 1998) concluded that in the general population, widespread screening of BRCA1 is not warranted. Utility of testing for the genes involves a complex interaction of family history, age, and genetic ancestry, all of which should be taken into account when considering testing or interpreting results (Newman et al., 1998). It just may not be necessary to spend the money. Commercial genetic testing costs from \$800 to \$2,500, and does not include the fee for genetic counseling (which averages \$300-\$500 per session - all women who receive genetic testing must first receive genetic counseling), a fee total many Black women will not be able to afford. Also, qualitative

research from prenatal genetic testing for Down's syndrome suggests that for Black women, experiences of urban poverty, neighborhood safety, and daily experiences of racism loom as larger threats than the chances of mutations (Rapp, 1997). These experiences, more pressing daily monetary concerns and issues of mistrust of may all steer some Black women away from genetic counseling and genetic testing.

Biological and constitutional factors

There are some data demonstrating biological and constitutional evidence that Black women may exhibit a more aggressive phenotype and develop breast cancer earlier than Whites which may contribute to survival disparity (Mayberry & Stoddard-Wright, 1992; Trock, 1996).

A well-studied area is the differential expression of estrogen reception (ER) status. ER status helps determine prognosis and treatment for locally recurrent or metastatic disease (Lefall, 1981). Poor ER status has been correlated with a grade of the tumor--well-differentiated, moderately well-differentiated, or poorly differentiated. Patients with well-differentiated tumors have higher ER status and the better chance of survival (Lefall, 1981). Trock (1996) found that compared to White women, tumors in African-American women "are more likely to occur at a younger age, to be poorly differentiated and estrogen receptor negative, and to exhibit high grade nuclear atypia, more aggressive histology (more medullary and less lobular), and higher S-phase" (p. 11). These factors appear to contribute to Black/White survival disparity. However Trock, as well as others before him (Austin et al., 1979), comes down soft on this issue and concludes that the significance of tumor biologic factors for the comparative breast

cancer survival of African American and White women remains to be determined.

Treatment differences

In one of the earliest studies to examine treatment differences as they relate to breast cancer survival, McWhorter & Mayer (1987) looked at the relation between race, type of initial treatment and survival with breast cancer in a large sample of Black and White cases reported to nine registries in the Surveillance, Epidemiology and End Results (SEER). They found Blacks were less likely than Whites to be treated aggressively and less likely to receive cancer directed therapy. These differences persisted even after adjusting for differences in age, stage and histology (McWhorter & Mayer, 1987). Other treatment differences have been found whereby African-American patients are less likely than White patients to have a progesterone receptor assay or to be referred for post-mastectomy rehabilitation (Diehr et al., 1989). Those same researchers also found that adjuvant therapy varied according to insurance coverage, type of hospital, physician qualifications and treatment regimes for African Americans diagnosed stage I-III breast cancer (Diehr et al., 1989).

Importantly, before cancer is even detected, there is evidence of treatment differences. For example, it is often on the advice of a physician that a woman initially seeks a mammogram (Caplan et al., 1992). In a study of 186 low socioeconomic urban, Black women's perceptions of breast cancer and mammography, 85% of the sample agreed that they would get a mammogram if their physician told them to do so (Alagna et al., 1987). However, physicians of Black women tend to recommend breast cancer screening procedures less often to them than to White clients (Gemson et al., 1988). The

role of the physician and nurse should not be underestimated. The most common reason Black women over 65 years of age gave in one study for not having a mammogram is that their doctor did not recommend one (Caplan et al., 1992).

It appears that even when Black women go for a mammogram, they are still less likely to receive the care they need or benefit from preventive care than are White women. In a recent retrospective review study of over 6,500 breast carcinoma cases in the Department of Defense Central Tumor Registry suggests that ready access to medical facilities improves survival rates for African American women. However, a significant unexplained difference in survival still exists between African American and White women (Wojcik et al., 1998). African American women were significantly younger, more likely to be divorced, and more likely to be diagnosed with stage II breast cancer than the White women. This suggests that the African American women may not have been screened as often as the White women. However, the subject's prior breast cancer screening history was not included in the study. The researchers conclude that differences in tumor biology, socioeconomic status, or sociocultural factors may contribute to diagnoses of African American women at younger ages and at later, higher risk stages of diseases.

Advanced stage of disease at diagnosis and lower SES

A later stage at diagnosis as it may relate to shortened survival time has been identified as contributing to higher mortality in Black women (Farley & Flannery, 1989; Freeman and Wasfie, 1989; Snow, 1983). It has been well-established that low-income minority persons are more likely than White women to present with advanced stages at

breast cancer diagnosis (Freeman & Wasife, 1989). It has also been established that low income minority women are more likely to delay seeking medical care after detecting possible cancer symptoms (Snow, 1983). As a lower survival rate has been linked to a later diagnosis (Bain et al., 1986; Bassett & Krieger, 1986; Dayal et al., 1982; Gordon et al., 1992; Vernon et al., 1985), the lower survival of Blacks was almost exclusively attributed to their lower socioeconomic status. The powerful effect of socioeconomic status on disease progression and outcome is well-established and was first observed in the 12th century (Syme & Berkman, 1990). Nonetheless, recent studies agree that socioeconomic status alone is not sufficient to explain the effect of race on breast cancer stage or survival rates (Eley et al., 1994; Lannin et al., 1998).

For example, in a large study that spanned four cities in three states (Eley et al., 1994), the researchers found that after controlling for geographic site and age, the risk of dying from breast cancer was 2.2 times greater for Blacks than Whites. Adjustment for stage reduced the risk from 2.2 to 1.7; further adjustment for sociodemographic variables had no effect (Eley et al., 1994). Even after adjusting for stage, treatment, co-morbid illness and pathologic and sociodemographic variables, Blacks continued to exhibit increased risk of death. The researchers conclude that 75% of the racial difference in survival was explained by the prognostic factors studied. Those included summary stage, tumor size, number of positive axillary nodes, tumor grade and estrogen receptor status. Sociodemographic variables, according to the researchers, appeared to act largely through racial differences in stage at diagnosis, which may be amenable to change through improved access to and use of screening for Black women (Eley et al., 1994).

Another recent study (Lannin et al., 1998) also concluded that SES factors alone are not sufficient to explain the effect of race on breast cancer stage. They found that it was SES in conjunction with cultural beliefs and attitudes that largely accounted for the effect. Beliefs such as the devil can cause a person to get cancer, women who have breast surgery are no longer attractive to men, and chiropractic is an effective treatment for breast cancer were predictors of late-stage at diagnosis (Lannin et al., 1998). Some other less studied reasons why Black women may delay treatment include suggestions that African Americans tend not to validate their illness out of a necessity to work to provide for their families (Long, 1993), the belief among some Blacks that physicians who practice Western medicine do not understand and therefore cannot as effectively treat their illnesses as can healers who practice folk and popular medicine (Snow, 1983), and as has been found among Hispanics, level of acculturation (O'Malley et al., 1999). Moreover, repeated encounters with discrimination in other settings (e.g., work place, social encounters), fear, pessimism about a cure, concerns about the inconvenience of obtaining medical care at free clinics, and suspicion of experimental treatment may all contribute to underutilization of medical care and increase likelihood of presentation at late stage disease (Long, 1993; Willis et al., 1989). This underutilization of care may be expressed as an underutilization of breast cancer screening.

Breast cancer screening

As breast cancer cannot be prevented, early detection is a woman's best defense. When breast cancer has grown to the point where physical symptoms can be felt or seen, breast changes include a lump, thickening, swelling, dimpling, skin irritation, distortion,

retraction, scaliness, pain, tenderness of the nipple, or nipple discharge (American Cancer Society, 1997). If found before it has spread to other parts of the body--localized breast cancer--the 5-year survival rate today is 97%, up from only 72% in the 1940s (American Cancer Society, 1997). This improvement can be in large part be attributed to the increased use of mammography. However, as breast problems can develop between mammograms, the use of other breast cancer screening methods (e.g., breast self-examination, clinical breast exams) should not be minimized.

Mammography. Mammography has become the "gold standard" for detecting breast cancer early. Mammography uses very low levels of radiation and involves two x-rays of each breast, one taken from the side and one taken from the top. Mammography reduces breast cancer mortality (thereby increases life expectancy), increases use of conservative surgery, and provides the reassurance that breast cancer is not present (Hurley & Kaldor, 1992). Risks associated with mammography, such as discomfort associated with the procedure, unnecessary investigations (including biopsy) in women with false-positive results, over treatment of breast abnormalities, false reassurance, radiation-induced breast cancer, and psychological morbidity (screening, investigations and early diagnosis) appear to be outweighed by the benefits (Hurley et al., 1992).

The National Cancer Institute, NCI, (1997) recommends that women receive a mammogram every one to two years. Women who are at higher risk of developing breast cancer are urged by NCI to seek professional medical advice about when and how often to have mammograms.

Racial/ethnic and socioeconomic differences have been found in use of

mammography such that women with lower incomes (Willis et al., 1989) and minority women (Long, 1993; Stein et al., 1991) are less likely to be screened for breast cancer than are White and higher income women. Even at similar income levels, however, Black women have been reported to utilize mammography at lesser rates. For example, Pearlman et al., (1996) found that Black women with incomes between \$20,000 and \$29,999 were less likely than Whites with comparable incomes to be in the under-screened and unscreened mammography-stages groups (Pearlman et al., 1996).

There have been conflicting findings. A recent reviewer writes that though a number of studies have shown Whites to be significantly more likely to be screened, national studies failed to demonstrate a significant relation between race-ethnicity and participation in mammography screening (Meyerowitz et al., 1998). Overall, mass screening efforts are reaching many women. Mammography screening has almost doubled among African American women (Bloom et al., 1991), yet Black women are still being diagnosed at a later stage of disease than White women. One reason may be that Black women are more likely to delay treatment once symptoms are present (Jones et al., 1995). It is at this juncture that understanding psychological processes may help.

Two important points should be stressed. One, mammography misses at least 10% of breast cancers (Winchester, 1992), and two, the majority of early-stage cancer as well as late-stage cancers are found by the patient herself (Lannin et al., 1998) -- which is why clinical breast examination by a health care provider and monthly breast self-exam are important complementaries to mammography (Foster et al., 1992) and should be encouraged.

Clinical breast exam. A clinical breast exam is typically done by a doctor or nurse as a part of a routine medical checkup (Farley & Flannery, 1989). Winchester (1992) recommends that: 1) physicians conduct the examination without distraction; 2) the patient should be examined in the upright and supine position as clinically subtle tumors in the lower half of the breast may produce skin retraction see only with the patient in the upright position with the arms elevated; and 3) the examination should be unhurried - at minimum 1.9 minutes. Conflicting results have been found between CBE and ethnicity. For example, while Duelberg (1992) found that African-American women were more likely to report having a CBE than White women (Duelberg, 1992), the 1986 Access to Care Survey found that those with lower income and less insurance were less likely to get physical breast exams (Hayward et al., 1988). In that study, ethnicity was not a significant predictor. Then again, because ethnicity and income generally covary, the inclusion of both in a model may contribute to the lack of significance of one or the other (Meyerowitz et al., 1998). Other studies have also found that Whites and higher income women are more likely to receive CBE than other minorities (Vernon et al., 1992; Caplan et al., 1992). As CBE is typically done at the time of a regular medical check-up, prior to mammography screening, or at the time of receiving a Papanicolaou smear, it is perhaps less likely that psychological distress plays a role in preventing women from receiving a CBE.

Breast self-examination. According to Foster et al. (1992), BSE is a lowcost, low-risk technique of breast cancer detection that has been advocated in the United States for over 30 years. BSE is an important health behavior that women have been urged to get in

the habit of performing because most breast cancer cases are discovered by the patient herself either by accident or deliberate self examination (Nemcek, 1990). In a study of 996 newly diagnosed patients, tumor diameters were smaller at the time of diagnosis in women who practiced BSE than in women who never or rarely practiced, a difference that translated into a significant lower five-year mortality (Nemcek, 1990). A more recent study supports the conclusion that women proficient at BSE are at significantly less risk for advanced breast cancer than their less proficient counterparts (Harvey et al., 1997).

Adopting BSE as regular part of one's behavior also appears to be related to other health promoting behaviors, including increased mammography use. For example, women who visit their physicians on a regular basis and incorporate BSE as routines are more likely to adhere to mammography screening recommendations (Bloom et al., 1991; Rimer et al., 1989; Willis et al., 1989). Practicing other cancer screening behaviors such as getting a Pap test, along with regular breast self-exam have been found to be positively associated with mammography screening (Pearlman et al., 1996; Willis et al., 1989). As for the utility of BSE itself, there is evidence that performing certain components of BSE (visual examination of the breasts, palpation with finger pads, and examination of the breasts with three middle fingers) reduces the risk of dying from breast cancer (Harvey et al., 1997). For optimal BSE results, women who are menstruating should examine their breasts monthly just as their menstrual period is ending. For women who are no longer menstruating, BSE should be done at the same time each month (Breastcancerinfo.com, 5/1/99).

Psychological factors related to breast cancer screening

As discussed earlier, studies exploring correlates of breast cancer screening have found that "race," lower income, and those with lower level of education play a role in screening. Minority women, women of lower incomes and lower levels of education do not screen as often. White women with higher incomes and higher education levels (Friedman et al., 1995; Schotenfeld et al., 1984). These "usual suspects" however, are not sufficient to explain non adherence in screening behaviors (Jones et al., 1995; Lannin et al., 1998). It may be important to take into account the "psychology" of breast cancer screening. For example, research has demonstrated that psychological morbidity (e.g., breast cancer worries, cancer anxiety, perception of risk, intrusive thoughts, etc.) impact on breast cancer screening (Lerman et al., 1994; Lerman and Schwartz, 1993; Kash et al., 1992). Thus, while there are obvious barriers to breast screening such as cost of the mammogram (Pearlman et al., 1996; Stein et al., 1991) lack of physician referral (Caplan et al., 1992; Friedman et al., 1995; Long, 1993; Vogel et al., 1997), and variables such as income and education (Meyerowitz et al., 1998), there are also other equally salient, but more subtle, barriers to screening. For example, among Black women, the fear of finding cancer (Friedman et al., 1995) and its social consequences may be a more salient barrier to mammography (Tessaro et al., 1994). Similarly, it has been reported that Black women who had never had a mammogram have higher cancer anxiety compared with Black women who had at least one mammogram (Miller and Hayley, 1994). Important is how psychological distress might impact on a delay in screening among Black women. Caplan (1995) found that 16% of women with potential breast cancer symptoms delay at

least two months before seeking help. He suggests that delay might be due to fear and/or denial of the seriousness of potential breast cancer (Caplan, 1995)-- (denying the seriousness may function as a fear reducer). As Black women are more likely to present with breast cancer at later stages than are White women, this area warrants closer examination.

One construct that may be related to fear of cancer among Blacks is cancer fatalism, the belief that cancer is a death sentence (Powe, 1995). Used used to understand colorectal screening among Blacks, it has been suggested that cancer fatalism is higher among African-Americans than Whites (Powe, 1995). This higher cancer fatalism may act as a barrier to Black women's participation in colorectal cancer screening (Powe, 1995). That conclusion is consistent with Friedman et al., (1995) who found that African-American women were more likely to report cancer-related fears and worries as barriers to mammography, compared with White women who were more likely to report being too busy, inconvenience and procrastination as barriers (Friedman et al., 1995). Though cancer fatalism as measured by the Powe's Fatalism Inventory (Powe, 1995) was not assessed in the present study, a review of psychological distress associated with cancer screening in Black women should make mention of that body of work. Fear, however, was not ignored in this study. Subjects were asked about their fear of finding a lump and how that fear may impact on their BSE behavior. It was also anticipated that the factors related to psychological distress that may contribute to delay in seeking a mammogram may also operate in BSE-- though not necessarily in the same direction. For example, compared to White women, Black women are more likely to perform BSE

at an exaggerated frequency (Epstein et al., 1997)—sometimes as much as every day (Wardlow & Curry, 1996). Consistent with a cancer anxiety hypothesis that Black women have greater cancer anxiety than White women, it has been found that women who perform BSE excessively are more likely to be older, less educated, have a family history of breast cancer, have intrusive thoughts about breast cancer, and to be African-American (Epstein et al., 1997). In our group's work, it was found that Black women with a high perception of risk and more intrusive thoughts about breast cancer were less likely to perform BSE at the recommended monthly interval; they either under or over-performed BSE (Guevarra et al., 1999). The problem with over performing BSE it that it may decrease sensitivity to gradual changes of the breast (Haagensen, 1952). Moreover, according to Epstein et al., (1997), over performance of BSE may increase the likelihood false-findings. Thus, like mammography, BSE may be sensitive to psychological distress. These effects maybe particularly pronounced among women with family histories of breast cancer who have been found two higher levels of cancer-specific distress. The next section explores the central areas of research with this group of women.

Perception of risk and breast cancer screening

It has been found that women with positive family histories of breast cancer differ significantly from women without family histories of breast cancer on measures of psychological distress. This difference may have to do with a greater perception of developing the disease. Having a family history of breast cancer has been shown to be related to an increased perception of developing the disease (Evans et al., 1993). In a

study of women participating in a breast screening program, Vernon et al., (1993) found that having a family history of breast cancer was the best predictor of who perceived their risk as high. In predicting breast cancer screening behavior, Massey (1986) found that women who practice breast self examination (BSE) six or more times a year had a significantly higher mean perceived susceptibility scores than women who practiced BSE less than six times during the preceding year. In related works, Polednak et al., (1991) found that among women without a family history of cancer between 50 and 64 years old, mammography during the past year was significantly more frequent among women with a higher than with a lower perceived personal risk. Among the family history group just the opposite was found: for family history positive women, mammography use during the past year was more frequent among women with a *lower* than with a higher perceived personal risk (Polednak et al., 1991).

Conversely, a recent meta-analytic review of breast cancer risk and mammography screening McCaul et al., (1996) found that feeling vulnerable to breast cancer and cancer worry prompts screening behaviors among women both with and without a family history of breast cancer. As the authors suggest, however, risk-screening relationships may vary for different kinds of screening (e.g., BSE, CBE, and mammography). For BSE, Stefanek and Wilcox (1991) suggest a curvilinear relationship between cancer worry and BSE. That is, increased worry about breast cancer and nervousness about BSE may serve as an energizing, motivational function when mild or moderate, but becomes disabling at higher levels. For mammography use, even the highest levels of concern, promotes screening behavior according to McCaul et al.

(1996). Again, most of these studies have been done with White samples. Research that examines the role that perceived risk, cancer specific distress and general distress play in cancer screening behaviors among Black women is scarce (Price et al., 1992; Royak-Schaler et al., 1993); and no study has examined these variables in a group/comparison study design with Black women.

It has been found that Black women attending a public health clinic greatly overestimate the incidence of breast cancer; two-thirds of the sample believed that 30-50% of women will develop breast cancer at some point during their lifetime (Duke et al., 1994). Psychological factors such as perception of personal risk and beliefs about screening effectiveness have been found to be significantly related to the breast cancer screening behaviors of Black women with family histories of cancer (Royak-Schaler et al., 1993). In a sample of 60 African-American, low-income women with a family history of breast cancer, 55% perceived themselves to be at risk of developing breast cancer during their lifetime, and 50% reported cancer worry and concern about their chances of developing breast cancer. Among women between the ages of 40-49, perception of risk prompted clinical breast exams. Those women were also more likely to have had a mammogram (Royak-Schaler et al., 1993). Consistent with this finding, Price et al (1992) found that among urban Black women, those who perceived themselves to be at highest risk for developing cancer, were also those most likely to desire a mammogram. A recent study examined the responses of 112 Black and 224 White women with positive family histories of breast cancer on measures of risk factors, risk perceptions, breast cancer worries, and breast cancer screening practices (Hughes et al.,

1996). Black and White women were matched for education and age, but not for income. Though there were no differences in past use of mammography, African American women were less likely to practice BSE according to guidelines.

Perception of risk for developing breast cancer has been found to be higher among women with family histories of breast cancer, but do these women also perceive a high personal risk of developing diseases other than breast cancer? For example, coronary heart disease (CHD) is the number one killer of women in the United States and stroke is the third, but women fear breast cancer more than cardiovascular disease (Legato et al., 1999). Among African Americans in particular, cancer is associated with a level of fatalism (Costanza et al., 1992) that CHD apparently does not arouse. The subjective evidence indicates, however, that CHD is the primary cause of excess mortality in younger women (predominantly African American women) in urban communities (McCord and Freeman, 1990). Though it may be that women with family histories of breast cancer perceive their risk for developing breast cancer as higher than women without family histories, they may not perceive a higher risk of developing diseases other than breast, even a disease like CHD. In the present study, both perception of risk for developing breast cancer and risk of developing heart disease was examined.

Psychological distress and breast cancer screening

Several studies have shown that having a family history of cancer, including breast cancer, may be related to elevated levels of distress (Gilbar, 1997; Zakowski et al., 1997; Valdimarsdottir et al., 1995; Kash et al., 1992). In a cohort of first-degree relatives of recently diagnosed breast cancer patients, one study found 53% of the sample reported

intrusive thoughts about breast cancer, 33% reported impairments in daily functioning due to breast cancer worries, and 20% reported sleep disturbance (Lerman and Schwartz, 1993). Most studies that examine psychological adjustment of women with family histories of breast cancer are descriptive in nature and rarely use a comparison group. At this paper's writing only three studies have examined the impact of having a family history of breast cancer on psychological adjustment in women with a family history of breast cancer by comparing them to a group of women without a family history of breast. One, Valdimarsdottir et al., (1995), found that women with positive family histories had significantly higher levels of avoidance and intrusive thoughts about breast cancer, as well as higher levels of general distress. Another, Zakowski et al., (1997) found that, compared to women without a family history of breast cancer, family history positive women report higher levels of intrusive thoughts and avoidance as well a significantly higher perceived risk of developing the disease. The third, Gilbar (1997), found that women with a first-degree relative with breast cancer had significantly higher levels of psychological distress on six of the nine sub-scales on the Brief Symptom Inventory than women with no such histories. These and other studies, however, examined psychological distress in mostly White samples. There is very little known about the impact of having a family history of breast cancer on psychological distress in Black women. From what is known, psychosocial factors such as cancer anxiety, intrusive thoughts about breast cancer; cancer related fears and worry, and cancer fatalism appear to be particularly high among Black women (Powe, 1996; Miller et al., 1994; Epstein et al., 1997), yielding mixed results (Royak-Schaler et al., 1993; Bagley-Burnett et al.,

1995; Stein et al., 1991). While Stein et al., (1991) did not find cancer anxiety to be related to mammography use, Miller and Hailey (1994) did find higher level of cancer anxiety in Black women who had not had a mammogram. Royak-Schaler et al., (1993) did not find breast cancer worries to be related to screening behaviors.

Being at familial-risk of developing breast cancer has been shown to have psychological consequences that affect cancer screening. For example, in a study of younger women at increased risk for breast cancer, Lerman, Kash, & Stefanek (1994) found that psychological distress was associated with non-adherence to mammography and with both infrequent and excessive BSE practice. Strauss et al., (1987) found that women with family histories of breast cancer had significantly higher BSE frequency, proficiency and knowledge than did a general-population group. The general-population group also had significantly lower levels of perceived risk of breast cancer than the family history group. In a sample of women with family history of breast cancer, Kash et al. (1992) found that 27% of the sample was defined as having a level of psychological distress consistent with the need for clinical intervention. Higher anxiety was directly related to poor attendance at a clinical breast examination and poor adherence to monthly breast self-examination. Brain et al., (1999) found that among women with family histories of breast cancer higher anxiety was related to excessive BSE (Brain et al., 1999). These subject population for all of these studies was predominately White. None were less than 85% White.

It has been found that African American women scored significantly higher than White women on avoidance of breast cancer-related thoughts and feelings (Hughes et al,

1996). The psychological variables in the study were associated independently with breast cancer risk perception, taking precedence over demographic and risk factor predictors. One possible explanation is that Black women had significantly greater concern about their personal risk of breast cancer and greater worries about their affected relative than the White women. Greater concern about the affected relative among the African-American women makes sense as 65% of the African-American women, as compared with 50% of White women, reported they were involved in the care of their affected relative. Care of an affected relative appeared to impair mood and daily functioning due to worries about the affected relative (Hughes et al., 1996). This is consistent with Zakowski's et al. (1997) work. Those researchers found that among women with positive family histories, women whose parent(s) died of cancer had the highest levels of intrusive thoughts and avoidance and the highest levels of perceived risk. As Black women are more likely to die of breast cancer than are White women, Black women with positive family histories of breast cancer may be more likely than White women to have experienced the death of a close family member from breast cancer. Experiencing the death of a close family member from breast cancer--a family member that one has cared for--may account for the higher level of psychological distress and, to some degree, breast cancer risk perceptions. These psychological variables may ultimately impact on breast screening behaviors expressed as lower levels of BSE practice and delay in seeking care for cancer symptoms.

There is evidence that having a first-degree relative with breast cancer affects screening in Black women, too. In a study of 1,053 first degree relatives of women with

breast cancer, Epstein, et al, (1997), found 8% of the sample performed BSE excessively (>once per day). Compared with women who did not perform BSE excessively, the excessive self-examiners were more likely to be older, African-American and less educated. The excessive self-examiners were also significantly more likely to have intrusive thoughts about breast cancer and to report that such thoughts affected their mood (Epstein et al., 1997). That study, however, did not have a comparison group of Black women without a family history of breast cancer to determine if the findings hold for women without familial risk. It may be that Black women in general have higher psychological distress than White women. However, the literature on Black women's breast cancer screening behavior has mostly focused on socioeconomic status and how it relates to breast cancer screening, usually by juxtaposing Black to White women. Information on how psychological distress affects breast cancer screening is lacking in both Black women with and without family histories of breast cancer. Another variable that has shed light on minority breast cancer screening patterns is level of acculturation, an avenue that has been left unexamined among Black women.

A theoretical framework: Using acculturation to predict breast cancer screening

When trying to understand the health behavior of any ethnic or racial group, an important factor to consider is level of acculturation. Acculturation is a process that refers to changes in values, norms, attitudes and behaviors as a result of being in contact with other cultures (Marin et al., 1987).

Used mostly to examine the experience of migrants moving to a sociocultural system different from their own, its significance for research comes from gaining an

understanding of psychological changes that result from exposure to a new and different sociocultural environment (Rogler et al., 1991). Acculturation has been called a "strategic research event" (Merton, 1987) as it offers researchers the opportunity to study the immigrant's unique experience of adopting the ways of the host society. The acculturation construct has been mostly used with other cultures. The construct has only recently been applied to African Americans.

Acculturation is a process that can be defined at both the societal and the individual levels (Szapocznik et al., 1978). Studies of acculturation and health behavior, however, have examined the process at the individual level. That is because the individual process of acculturation "involves the modification of the person's customs, habits, language usage, life style and value orientations" (McWhorter and Mayer 1987; Szapocznik et al., 1978). Acculturation impacts individuals at all levels of functioning, including behavioral, affective and cognitive (Cuellar et al., 1995). According to Cuellar et al., (1995), the behavioral level includes verbal behavior or language, customs, foods, and music. At the affective level are the emotions that have cultural connections. At the cognitive level are beliefs about male/female roles, ideas about illness, attitudes toward illness, and fundamental values (Cuellar et al., 1995).

The utility of the construct can be seen in the variety of ways it has been used to explain a diverse range of behaviors and health outcomes in minorities. For example, acculturation has been linked to negative mental health outcomes (Landrine & Klonoff, 1996; Szapocznik et al., 1980; Szapocznik et al., 1978); risk of coronary heart disease (Reed et al., 1982); higher levels of alcohol and drug use (Graves, 1967; Padilla et al.,

1979; Weber, 1996) suicide (Vega et al., 1993), eating attitudes and behaviors (Akan & Grilo, 1995), lower condom use and needle cleaning (Nyamathi et al., 1995), higher prevalence of hypertension (Hollenberg et al., 1997), and under use of pap smear and mammogram screening (Kaplan et al., 1996). What is usually found is that persons who are more highly acculturated (i.e., more like the host society) are those most likely to experience better health outcomes. For example, among Hispanic women acculturation has been found to influence breast cancer screening (Elder et al., 1991; Marks et al., 1987; O'Malley et al., 1999; Richardson et al., 1987; Stein & Fox, 1990; Solis et al., 1990; Suarez, 1994;). A recent study of Hispanic women (e.g., Colombian, Ecuadorian, Dominican, Puerto Rican) in New York City found that when demographics, SES, health system characteristics, and cancer attitudes and beliefs were controlled, women who were more acculturated had significantly higher odds of ever and recently receiving a CBE and of ever having a mammogram (O'Malley et al., 1999).

Other studies of Hispanic women have also found that lower levels of acculturation are linked to lower mammography use (Stein & Fox, 1990; Suarez, 1994) and less likelihood of having a recent Pap smear (Suarez, 1994). English proficiency appeared to act as proxy for acculturation in those studies (Stein & Fox, 1990; Suarez, 1994). Lower levels of acculturation have also been linked to greater psychological distress in Hispanics. However, this finding appears to operate through financial problems and social isolation (Krause & Goldenhar, 1992).

In many of those studies, language acquisition was found to be the strongest predictor of level of acculturation (Stein & Fox, 1990; Suarez, 1994). Stein and Fox

(1990) also found that language preference was a good indicator of mammography use among Hispanic women. Hispanic women requiring or preferring an interview in Spanish (those who were less acculturated) were found to be poorer, considerably less educated, under-insured, and unlikely to have ever had a screening mammogram (Stein & Fox, 1990). Similarly, Kaplan et al., (1996) found that higher level of acculturation was related to higher mammography use in Hispanic women. Similar results have been found among Asians. Among Korean American women, Maxwell et al., (1998) found that greater acculturation was related to "ever having a mammogram", and among college-aged Vietnamese women in the United States, greater language acculturation was related to regular pap smear (Yi, 1999). Prior to the present study, it was unclear if level of African American acculturation would predict breast cancer screening, and if acculturation is predictive, what aspect of African American acculturation (e.g., traditional African American foods, socialization, beliefs, preference for African American things, etc.) would be the most predictive of BSE frequency.

African American acculturation: What is it and how does it relate to breast cancer screening?

African American acculturation has been defined as the extent to which African Americans participate in the cultural traditions, values, beliefs, and practices of their own culture versus those of the dominant 'White' society (Landrine & Klonoff, 1994). According to Landrine and Klonoff (1996) the concept of acculturation is a non-racist way of explaining and understanding ethnic differences. Those researchers examine African American acculturation on a continuum from traditional to acculturated

(Landrine & Klonoff, 1994). The more acculturated one is the more one adheres to the host society's ways and customs. Traditional people are those who remain immersed in beliefs and practices of their own culture of origin.

Acculturation has mostly been used in studies involving persons who immigrate to a host society. Measures of acculturation almost always ask about language usage and preference, foods particular to a particular ethnic group, and social interactions with host society. Some measures of acculturation go further and ask about level of ethnic pride and identity. The hypothesis is that the more one is immersed in his/her ethnic background the less "acculturated" he or she is. Importantly, less acculturated women (e.g., those who shy away from physicians and medical institutions due to language and perceived barriers) may be less likely to learn about proper breast self-examination and other breast cancer screening behavior. Breast cancer screening behaviors are very much related to one another. For example, women who report less regular cancer screening by clinical breast exam, Pap smear, or BSE, are less frequent users of mammography (Pearlman et al., 1996). Similarly, Bloom et al., (1991) found that BSE was the single most important predictors of having a mammogram; Black women who practiced self-examination were almost twice as likely to have a mammogram as those who did not (Bloom et al., 1991). Neither study, however, gathered information on who taught the women how to do BSE. Jacob et al., (1989) found that frequency of breast self-examination among Black women was significantly related to, among other things, having been taught to perform the exam by a doctor or nurse. Moreover, Duke et al., (1994) found among Black women who attend public health clinics that physicians are a

first source of information about BSE. Thus, it appears that Black women who are already receiving care are those most likely to learn BSE and to engage in other cancer screening behaviors. Black women who lack trust in medical institutions and therefore, who do not come in for screening would be those less likely to receive proper cancer screening and less likely to learn about proper BSE behavior. Among those who know how to perform BSE, acculturation may influence women's decisions to engage in this screening behavior. In the present study, data were gathered from a cancer screening clinic where women are taught how to do BSE by a nurse practitioner and received additional information in written and video form on proper BSE.

Linked closely with cultural mistrust is the role acculturation has been reported to play in physical and mental health outcomes. For example, there is evidence that African-Americans who smoke are more traditionally African American than their nonsmoking counterparts (Landrine & Klonoff, 1996). The African-American smokers in that study also exhibited greater distrust of Whites (as measured by the Attitudes subscale on the acculturation measure), more non-Western health beliefs, endorsed more superstitions, and were more likely to eat traditional foods than nonsmokers (Landrine & Klonoff, 1996). The authors suggest that more traditional African-Americans may distrust Whites to such an extent that they distrust the information about smoking provided by Whites. These researchers suggest that current and historical racism and poor relations between Whites and African-Americans may play a role in African-American health (Klonoff & Landrine, 1997). Similar considerations may apply to acculturation and BSE, but have yet to be examined.

Another suggestion by Landrine and Klonoff (1996) is that traditional African-Americans (those scoring lower on acculturation) may experience significantly greater emotional distress (e.g., depression, anxiety, tension) than their more acculturated counterparts *because the two groups are treated differently by European Americans* (Landrine & Klonoff, 1996). Those researchers offer an example whereby Whites would view traditional African-Americans as more stereotypically "Black" than their acculturated counterparts, thus leading to more experienced discrimination by these (i.e., less-acculturated) African-Americans. This pattern would result in higher levels of stress, depression and anxiety among more traditional African-Americans. Those negative states could then lead to greater smoking. Importantly, those researchers examined whether their findings were due to differences in social class rather than acculturation. The sample did not differ on income or type of neighborhood (Black vs. Other Neighborhood) suggesting that the observed relationships between acculturation and smoking was not an artifact of social class or type of neighborhood (Landrine & Klonoff, 1996).

The acculturation construct has only recently been used to examine the health behaviors of African Americans, and to date, has not been used to understand breast cancer screening in this group. The first reason is that African Americans have long been regarded in psychological research as a "racial group" rather than as a group with a cultural background (Landrine & Klonoff, 1994). In so doing, psychology has removed the culture from African Americans. Second, acculturation has traditionally been applied to understanding the experience of migrants moving to a sociocultural system different

from their own and understanding how they adapt to the host society (Rogler et al., 1991). This application does not pertain well to African Americans. American culture is their own, too. They speak and understand English and are exposed to the same foods, music, television shows, movies, etcetera, as White Americans. Or are they? African Americans do have a culture of their own, one that deviates from "mainstream" America, and one that has its own values, assumptions, styles, preferences, and foods. Thus, for a long time there was not an instrument designed to measure level of African American acculturation. While the acculturation construct has been around since the 1950's, an instrument designed to measure level of African American acculturation was not published until 1996 (Landrine & Klonoff, 1996).

Studies using the instrument for African American acculturation have found that African American smokers tend to be less acculturated than their nonsmoking counterparts (Kimbrough et al., 1996) and less acculturated African-Americans exhibit higher blood pressure than their more acculturated counterparts (Klonoff & Landrine, 1996). This is consistent with the works of Stein et al., (1991) and Maxwell et al., (1998) who have found that, among Hispanics, higher levels of acculturation appear to be related to more positive physical health behaviors. Also relevant to the present study, recent research has found that socioeconomic status in conjunction with cultural beliefs and attitudes predicted later-stage at diagnosis for breast cancer in Black women (Lannin et al., 1998). Though using an unstandardized measure, that study was one of the first to actually assess cultural factors and relate them to breast cancer stage at diagnosis in Black women.

Initial findings using the African American Acculturation Scale find that the sub-scales relate to health outcomes in different ways. For example, more highly acculturated African Americans (as measured by the childhood, superstitions and cultural mistrust sub-scales) tended to have greater knowledge of the behaviors that spread AIDS than more traditional African Americans (Klonoff & Landrine., 1997). In studies of smoking behavior, more highly acculturated African Americans (as measured by the preparation and consumption of traditional foods, interracial attitudes/cultural mistrust, health beliefs and practices, and superstition sub-scales) were less likely to smoke than more traditional African Americans (Klonoff & Landrine, 1996). To date, no study has examined which of the sub-scales might be related to breast cancer screening.

Of particular interest is the Preference for African American Things sub-scale as "preference" for one's own cultural things, which is a fundamental part of, not only African American acculturation, but also the broader acculturation construct. For example, on both of the only published measures of African American Acculturation there is a preference sub-scale (Landrine & Klonoff, 1996; Snowden & Hines, 1999). On the Suinn-Lew Asian Self-Identity Acculturation Scale there are questions about preference for Asian food, music, T.V., movies, language and people (Suinn et al., 1992). Similarly, preference questions are found on the Acculturation Scale for Mexican Americans (Cuellar et al., 1990) and on a measure of Puerto Rican acculturation (Cortes et al., 1994). The Preference sub-scale on the African American acculturation sub-scale assesses preference for African American newspapers, magazines, music and games, and for African American people (Landrine & Klonoff, 1996). According to the authors,

traditional African Americans should show more of a preference for their own culture's music and arts and people than acculturated African Americans (Landrine & Klonoff, 1996).

The literature suggests that level of acculturation might affect screening in Black women (Landrine & Klonoff, 1996). However, this possibility has not previously been put to an empirical test. Using the Hispanic studies as guides, this study was the first to examine relationships between levels of acculturation and psychological distress as they relate to BSE frequency among African American women.

Summary. The present study compared Black women with family histories of breast cancer to those without family histories of breast cancer on perceived risk, psychological distress, and compliance with breast self-examination guidelines. Most studies which have found that psychological distress is related to inappropriate breast self-examination frequency did not include a comparison group. This omission makes it impossible to examine independent and interaction effects of family history on level of distress and BSE frequency. Since the media have recently focused so much attention on breast cancer awareness, it may be that women without a family history of breast cancer also experience psychological distress about breast cancer. This distress may be sufficient to impact on breast self-examination frequency. The present study is also the first to empirically test the impact of acculturation on breast self-examination frequency among Black women and to examine the possible interaction with family history.

For clarity, the study is described in two parts. The first part addresses issues that relate to psychological distress associated with having a family history of breast cancer.

That part compared women *with* a first-degree relative with breast cancer (Family History Positive Group) to women *without* a first-degree relative with breast cancer (Family History Negative Group) on measures of perception of risk, distress (general, cancer-specific, BSE-specific) and breast self-examination (BSE) frequency (N=100). The second part examines how African American acculturation relates to BSE frequency among a sub-sample (N=67).

Study hypotheses: Part 1

Perception of personal risk for breast cancer

Hypothesis 1. Women in the family history positive group (FH+) will differ from women in the family history negative group on measures of perception of personal risk of developing breast cancer. This difference has previously been demonstrated in White women with family histories of breast cancer (Valdimarsdottir et al., 1995; Zakowski et al., 1997). Women in the FH+ Group have been found to have a higher perception of personal risk of developing breast cancer. When Black women with family histories of breast cancer are compared with White women with similar family histories of breast cancer, it has been found that White women report higher perceptions of personal risk following the diagnoses of a relative with breast cancer (61% vs. 82%; $p < .001$) (Hughes et al., 1996).

The FH+ and FH- women will also be compared on their perception of risk for heart disease. For example, it may be that FH+ women are so burdened with their perception of risk for breast cancer, they pay less attention to their risk of heart disease. Comparing FH+ women to FH- women on perception of risk for diseases other than

cancer has not previously been examined in the literature. Although there are studies that examine perception of coronary heart disease (CHD) risk (Avis et al., 1989; Becker & Levine, 1987; Moran et al., 1989) this will be one of the first to examine perception of risk for CHD among women with family histories of breast cancer.

Psychological distress

Hypothesis 2. The Groups will differ on intrusive thoughts about breast cancer. This has previously been demonstrated with White women (Zakowski et al., 1997; Valdimarsdottir et al., 1995). Women with family histories of breast cancer have been found to have high levels of intrusive thoughts about breast cancer. To date, no study has looked at how FH+ Black women compare to FH- Black women on intrusive thoughts about breast cancer.

Hypothesis 3. The Groups will differ in their levels of general distress. There is evidence that having a family history of breast cancer increases psychological distress (Lerman et al., 1994; Kash et al., 1992). Though not always (Zakowski et al., 1997), general distress (as assessed by the Brief Symptom Inventory), has been found to be higher in this group compared with women without a family history of breast cancer (Valdimarsdottir et al., 1995; Gilbar, 1997).

Hypothesis 4. The Groups will differ in their levels of BSE-specific distress. Though psychological distress such as intrusive thoughts about breast cancer and general distress have been found to be higher in women with a family history of breast cancer (Gilbar, 1997; Valdimarsdottir et al., 1995), distress specific to BSE has not been examined. This will be the first study to examine if women with a family history of breast cancer

experience more distress specific to BSE than FH-.

Breast self-examination (BSE) behavior

Hypothesis 5. The Groups will differ on BSE frequency. There is evidence that FH+ women do not adhere to BSE guidelines, either under performing BSE (Stefanek et al., 1992; Houts et al., 1991) or performing BSE excessively (Lerman et al., 1999). It has also been reported that among FH+ women, those who dramatically over performed BSE (once a day) were more likely to be African American (Epstein et al., 1997). In a recent paper that examined how family history affects BSE frequency in Black women, it was found that women with and without family histories of breast cancer do not differ on BSE frequency. However, that paper employed a sample of only 55 women (Guevarra et al., 1999).

Predictors of BSE frequency

Hypothesis 6: Psychological distress (intrusive thoughts about breast cancer, general and BSE-specific distress) and perception of risk will affect BSE frequency. The literature suggests that apart from family history, differences in breast cancer screening behavior may be related to intrusive thoughts about breast cancer, perception of risk and general distress. The main effect of those variables on BSE frequency was examined.

Test of a mediational model

Hypothesis 7. The relationship between family history and BSE frequency will be mediated by psychological distress and perception of risk. At least two prior studies have found that compared with FH- women, women with a family history of breast cancer have higher psychological distress (Zakowski et al., 1997; Valdimarsdottir et al., 1995).

It has also been reported that having a family history of breast cancer affects BSE frequency (Kash et al., 1992), and that psychological distress is related to BSE frequency (Epstein et al., 1997; Brain et al., 1999). It was hypothesized that the relationship between family history and BSE frequency will be due to higher levels of distress and perception of risk in the FH+ Group.

Study hypotheses: Part 2

Differences on acculturation between the family histories groups are not expected, but it will be examined. The focus of Part 2 will be on level of acculturation and its relationship to the outcome variables of interest.

Acculturation and BSE

Hypothesis 8. Level of acculturation will be related to BSE frequency. There is evidence that lower levels of acculturation in Hispanic women are related to never having a mammogram and clinical breast exam (Olsen et al., 1999). There is also evidence among African Americans that lower levels of acculturation are related to negative health behaviors (e.g., smoking.) (Landrine & Klonoff, 1996). The present study will be the first study to examine how levels of acculturation affect BSE frequency among African American women.

Acculturation and Psychological Distress

Hypothesis 9. Levels of acculturation will be related to psychological distress and perception of risk. At least one study has found that lower levels of acculturation among African Americans are related to greater psychological distress (Landrine & Klonoff, 1996). Among Hispanics, lower levels of acculturation have consistently been shown to

be linked to poorer mental health outcomes (Rogler et al., 1991).

Test of a mediation model

Hypothesis 10. The relationship between levels of acculturation and BSE frequency will be mediated by psychological distress. Acculturation has been found to be related to breast cancer screening, at least among Hispanic women (O'Malley et al., 1999).

Acculturation has also been found to be related to psychological distress among African Americans, and other ethnic groups (Landrine & Klonoff, 1996; Rogler et al., 1991; Tran et al., 1996), and as mentioned earlier, psychological distress has been found to be related to BSE frequency. It was hypothesized that the relationship between acculturation and BSE frequency will be due to higher levels of distress and perception of risk.

Method

Data were gathered as part of an ongoing bio-behavioral investigation of the effects of stress associated with having family histories breast cancer. For Part I of this study, data on sociodemographics, general distress, BSE specific-distress, cancer-specific distress, perceived risk of cancer, and breast cancer screening behaviors were gathered in women who self-identified as Black or African American (N=100). Part 2 is comprised of a sub-sample of Part I (N=67). Part 2 involves data from women who self-identified as African American; who answered all measures from Part I; and who completed the African American Acculturation Scale (Landrine & Klonoff, 1996). All data were gathered from a breast cancer screening clinic in Harlem, New York.

Setting. The Breast Examination Center of Harlem (BECH) of Memorial Sloan-Kettering Cancer Center provides comprehensive breast and/or cervical cancer diagnostic

screening services. All services are provided at no out of pocket cost to the client. For clients with insurance, their insurance companies are billed for services provided.

Ninety-seven percent of the BECH's client population is Black or Latina.

Procedure. Women were met and recruited from the BECH clinic on the day of a regular clinical mammogram or pap smear appointment by an African American female researcher. This approach was designed to enhance consistency and the reliability of data collected, and because previous research has found that the acculturation measure needs to be administered with an explanation (Landrine & Klonoff, 1996), preferably by an African American researcher. Precautions are taken because previous researchers have found that some African Americans, usually those who are more acculturated, have become offended by the questionnaire (Landrine & Klonoff, 1996).

To ensure that normal clinical results had been received by all study participants, the first assessment was scheduled for three weeks to one month after the initial recruitment contact. A woman was not eligible to participate if an abnormal clinical finding was reported. Only two participants contacted after recruitment were not eligible to participate because of suspicious findings.

On the day of study assessment, women again came to the clinic and were greeted by study personnel. After informed consent was obtained, women completed a 55-minute assessment that gathered information on psychological, behavioral and cultural variables of interest. To reduce subject burden, a 20-minute questionnaire was completed at home and returned by mail the next day. All subjects received \$20 plus the cost of round trip public transportation. For Part 2, women were screened to ensure that: they

self-identified as African American; they understood that the questionnaires were culturally specific to African Americans; and they were aware that some persons find the questionnaire offensive (Landrine & Klonoff, 1996). Of the 68 subjects given these instructions, only one refused to answer the questionnaire. Her data were not included in Part 2's analysis.

Participants. To be eligible, subjects had to be 25 or older, able to read and write English, and be able to provide meaningful informed consent. Women who had a personal history of neoplasm or abnormal pathologic reports were excluded. As part of the larger study, women who were pregnant or had an infectious illness were also excluded.

Measures

Demographics

Demographic Questionnaire. A standard questionnaire was used to obtain information on age, education, income, employment, marital status and living arrangements, race/ethnicity, and health related variables (Valdimarsdottir et al., 1995).

Psychological Distress Measures

General Distress

Brief Symptom Inventory (BSI) (Derogatis & Spencer, 1982). The 53-item, self-report measure has nine symptom dimensions and three global indices of distress. The nine sub-scales are: Somatization; Obsessive-Compulsive; Interpersonal Sensitivity; Depression; Anxiety; Hostility; Phobic Anxiety; Paranoid Ideation; and Psychoticism. The three global indices are the Global Severity Index (GSI); the Positive Symptom Distress Index (PSDI); and the Positive Symptom Total (PST). The reliability of the

scale has been demonstrated by internal consistency ($r=.77-.90$) and test- re-test reliability ($r=.80 -.90$) for all scales. The measure was selected because it has been used in previous studies of distress in women at familial risk for breast cancer (Valdimarsdottir et al., 1995; Kash et al., 1992). Participants were asked to report on symptoms experienced within the past three weeks of the in-person visit. For purposes of this study, only data from the GSI were used. *Statistical transformation:* The results of the GSI were not evenly distributed and were therefore dichotomized at the median (median .471; $N= 49$ and $N = 51$).

Cancer-specific distress

Impact of Events Scale (IES). The IES (Horowitz et al., 1979) assesses distress anchored to a specific stressor (in this case, the threat of breast cancer), yielding sub-scores for intrusive and avoidance experience. Reliability has been demonstrated by total score split-half reliability ($r=.86$) and total scale and sub-scale test-retest correlations (total $r=.87$, intrusion $r=.89$, avoidance $r=.79$). Subjects reported their experiences over the past three weeks.

The Intrusion sub-scale of the IES was used to measure the frequency and severity of intrusive thoughts and feelings related to breast cancer. This sub-scale has adequate internal consistency (Chronbach's alpha .78) and has been used in previous studies as a measure of the psychological impact of having a family history of breast cancer (Lerman et al., 1994). The Avoidance sub-scale has also been used in studies with Black and White women with families histories of breast cancer and has revealed significantly higher avoidance in Black women (Hughes et al., 1996).

Statistical transformation: In this sample, results on the Intrusion and Avoidance sub-scales of the IES were bi-modally distributed, with a large number of women scoring zero on the sub-scales. The intrusion sub-scale was dichotomized at the median (median = 3; N=52 and N=48), and the Avoidance sub-scale was also dichotomized at the median (median = 4.5; N=50 and N=50). Possible scores on the Intrusion sub-scale range from 0 to 35, and on the Avoidance sub-scale the possible range is 0 to 40. In this sample, the Intrusion results ranged from 0 to 31, and the Avoidance sub-scale ranged from 0 to 38.

Breast self-examination specific distress

BSE specific distress. One question, "*I would rather not perform breast self-exams because I'm afraid that something would be found*" was used to assess BSE specific distress. The item, adapted from a mammography questionnaire developed by Rimer et al (1991), was scored on a five-point scale ranging from (1) *Strongly disagree* to (5) *Strongly agree*. Women circling at the low end of the scale were categorized as "low" distress. For theoretical reasons, the question was trichotomized into low (N=75), medium (N=12) and high distress (N=10).

Perception of Risk

Perceived risk of developing breast cancer. Individuals frequently over- or underestimate their risk of developing cancer when asked to simply give a numerical value of risk suggesting that administering questions in more qualitative terms may increase subject understanding (Hallowell et al., 1998). In this study, both numerical and qualitative questions about of breast cancer risk were used. Numerical. Subjects were asked: 1) *On a scale 0% (not at all likely) to 100% (extremely likely) how likely do you*

think it is that you will develop breast cancer in your lifetime; 2) What is the lifetime risk of developing breast cancer for the average women in the United States (0%-100%?).

Qualitative: *1) If you had to think of the possibility that you might someday get breast cancer, how would you rate your chances compared to other individuals with a similar family history of cancer? A) Much higher B) A little higher C) The same D) A little lower E) Much lower.*

Statistical transformation: On Question 1 (likelihood of developing cancer), 39 women answered "50" thus the results were trichotomized into less than 50 (N=40); equal to 50 (N=39); and greater than 50 (N=21) Question 2, (lifetime risk for the average women), was trichotomized into less than 50 (N=32); equal to 50 (N=25); and greater than 50 (N=43). On Question 3, (rate your chances of developing breast cancer compared to others), the results were also trichotomized into Lower (N=27); the Same (N=38); and Higher (N=32).

Objective Risk

Family History of Breast Cancer. The questionnaire is designed to assess the occurrence of cancer in subjects' biological relatives as well as other variables related to cancer diagnosis (Zakowski et al., 1997). Familial risk of breast cancer was quantified by using the Claus et al., (1994) model for determining heritable risk for cancer. The model is based on the number of affected relatives and on age at diagnosis of the affected relatives. According to the model for example, a woman with a history of just one first-degree relative affected with breast cancer in her thirties, has an estimated risk of 16.5 percent of developing breast cancer by age 79 (Claus et al., 1994). The estimated risk

increases to 44 percent if the woman has two first degree relatives diagnosed with breast cancer in their thirties (Claus et al., 1994).

Perceived risk of developing heart disease. One question assessed perception of risk for heart disease: 1) *On a scale 0% (not at all likely) to 100% (extremely likely) how likely do you think it is that you will develop heart disease in your lifetime. Statistical transformation: The scale was dichotomized into less than 50 (N=57) and greater than 50 (N=43).*

African American Acculturation.

African American Acculturation Scale (AAAS) (Landrine & Klonoff, 1994). The AAAS 74-item scale assesses eight dimensions of African-American culture: (1) *African American religious beliefs and practices; (2) African American family structure and practices; (3) African American socialization; (4) Preparation and consumption of traditional foods; (5) Preference for African American things; (6) Interracial attitudes; (7) Superstitions; and, (8) African American health beliefs and practices.* These dimensions individually, or as a summary score, are thought to provide an identification of cultural connection rather than racial attributions per se (Landrine & Klonoff, 1994). Answers range from 1 (I totally disagree, this is not at all true of me) to 7 (I totally agree, this is absolutely true of me); total scores on the AAAS have a range of 74 to 518. The AAAS has demonstrated high internal consistency, reliability and high split-half reliability, as well as group differences and concurrent validity. (Landrine & Klonoff, 1994). The AAAS is designed to measure aspects of African American acculturation on an unidimensional continuum, high scores indicate low acculturation (traditionally

African American lifestyle, views), and low scores indicate high acculturation (closer to the American mainstream) (Landrine & Klonoff, 1996).

According to Landrine and Klonoff, (1996), about one-third of their African American subjects complained about the scale, becoming quite angry and writing negative comments on the questionnaire. When Landrine and Klonoff (1996) examined the scores of subjects who complained, they found that those subjects were highly acculturated to American society. The subjects who were traditionally African American appeared to enjoy the scale. Landrine and Klonoff (1996) cautioned researchers in a footnote about such volatile responses. In anticipation of possible negative reactions, the scale was administered only by an African American female researcher to women who first self-identified as African American. All participants were given a brief description of the AAAS and asked if they would like to answer the questions. Only one woman refused to answer the questionnaire. Her data were excluded from the acculturation analysis.

Statistical transformation: The original scale contains 74-items and eight scales that added approximately 25-minutes to the larger study's assessment. To reduce subject burden, a five sub-scale "short" version was administered to 31 women. The shortened scale contained only five of the eight sub-scales, and only some of the items from five sub-scales. For example, only 4 of 10 items from the Foods sub-scale, 8 of 12 items from the Health Beliefs sub-scale, 6 of 11 items from the Socialization sub-scale were on the shortened-scale. All of the items from the Preference (11 items) and Interracial Attitudes sub-scales (7 items) were on the shorten-scale. Later, an additional 34 women answered

the entire eight sub-scales (74 items).

To effectively use the data from all women answering questions on acculturation, Dr. Winkel and Dr. Valdimarsdottir assisted me in an imputation statistical process. The procedure generated complete data for the sub-scales with items missing, (Health Belief, Foods, and Socialization). In the process for example, data from the women that answered all 11-items on the food scale was used to compute a score for the women answering only 4-items. The imputed score generates a score for the subject "as if" she answered all Food questions. For the acculturation analysis, data from 67 women answering five sub-scales were used (three imputed scales, and two entire scales).

A first examination of the data from the 36 women who answered the entire scale found that of the eight sub-scales, the Preference for African American Things was the only sub-scale significantly related to both long and short-term BSE frequency (ANOVA analysis). This lends support for what was found when data from the entire sample (N=67) was analyzed using a backwards elimination regression procedure.

Psychological, BSE, demographic and family history data from the women who answered the entire scale (N=36) did not significantly differ from the women that answered the short-version (N=31).

Behavioral Measure

Breast Self-Examination - The Breast Cancer Screening Behavior Checklist (BCSBC). The BCSBC developed by researchers at Memorial Sloan Kettering Cancer Center (Kash et al., 1992) was used to assess BSE frequency. Two questions on breast self-examination frequency were used for this study:

BSE yearly. To assess compliance with the recommended guideline of monthly BSE (American Cancer Society, 1999), subjects were asked to indicate how frequently they performed BSE over the past 12 months: (1) *more than once a month*; (2) *Once a month (12 times a year)*; (3) *Every other month (6 times a year)*; (4) *Four or five times a year*; (5) *Two or three times a year*; (6) *Once a year*; (7) *Never*. Following the methodology of Lerman et al., (1991), subjects were categorized as appropriate performers if they performed BSE once per month (N=26); under performers if they performed BSE less than once a month (N=44); and over performers if they performed BSE more than once a month (N=30).

BSE over past three weeks. Unlike the yearly measure which has set guidelines, but may be subject to memory bias, the short-term BSE measure assessed BSE performance over the past three weeks. The 6-point scale asked the women to assess their BSE performance on a scale of: (a) *never* (b) *once* (c) *2-3 times* (d) *4-5 times* (e) *six or more times*. The scale was trichotomized and subjects were categorized as appropriate performers if they performed BSE (N=32); under performers if they did not perform BSE (N=33); and over performers if they performed BSE over two or three times (N=34). As expected, the short and long-term BSE measures were significantly related to one another (chi-square $F=55.36$, $p < .001$).

Results

Part 1

The first analyses compared the FH+ Group to the FH- Group on demographic variables. No significant Group differences were found on any of the demographic

variables (See Table 1). Subject demographics. One hundred Black women participated in Part 1. Forty-three had at least one first-degree relative (FDR) with breast cancer (FH+ Group) and 57 did not (FH- Group). Demographic variables for the FH+ and FH- Groups are shown in Table 1. No significant demographic differences between the Groups were found. The following is a summary of the subject characteristics:

Age. Age ranged between 26 - 72 years. Median age was 45 years. Mean age was 45.5 years, standard deviation equaled 10.53 years. FH+ and FH- Groups did not differ on age ($F=.50, p < .480$).

Education. 38% of the sample completed some college or received specialized training. 84% completed at least high school. Only 16% did not finish high school--and 12% of those who did not finish high school completed at least the 10th grade. For statistical purposes, education was divided into two categories: High School Graduate and Non-High School Graduate. The FH+ and FH- Groups did not significantly differ on education ($\text{chi-square} = .235, p < .628$).

Income. The majority of the sample, (63%), had a family income between \$10,000-\$39,999. When examined more closely, 18% had a family income of less than \$10,000; 30% had a family income between \$10,000 and \$19,999; 33% had an income between \$20,000 and \$39,999; 18% had a family income of greater than \$40,000 or more. Only 1 woman had a family income over \$100,000. For statistical purposes, the sample was divided into three categories: less than \$10,000 (N=18); \$10,000-\$39,999 (N=63); and greater than \$40,000 (N=19). The idea was that the \$10,000-\$39,999 category captured the most subjects (N=63) and created a "middle-income" range for the sample. No significant differences were found between the FH+

and FH- Groups on income (chi-square 4.119, $p < .128$).

Employment. The majority of the sample, 62%, worked either part or full time - (43% worked full -time and 19% worked part-time). Subjects were asked "Which category best describes your occupation? If you are not currently employed, which best describes your LAST job? If you are a homemaker, which best describes your spouse's usual occupation?" 10% answered "manager, administrator or proprietor"; 28% "professional, technical & related occupations (as teachers/professors, nurses, lawyers, physicians & engineers"; 32% held positions in "clerical and related occupations (secretaries, clerks or mail carriers); and, 20% "other." Women writing in answers in the "other" category most commonly wrote "babysitting" or "childcare provider." For statistical purposes, the results were dichotomized into employed and unemployed. The FH+ and FH- Groups did not significantly differ on employment status (chi-square=.043, $p < .836$).

Marital Status. 29% of the women were currently married; 29% never married; and 42% were either separated, widowed or divorced. 33% lived with a spouse or partner and 24% lived with their children, no partner. Results were examined and compared as percentage currently married, percentage living with a spouse or partner, and percentage living with children but no partner. FH+ and FH- Groups did not significantly differ on either marital status or living arrangements.

Objective risk of developing breast cancer.

The objective lifetime risk of developing breast cancer for the "average" American woman is 1 in 9, or about 12%. Consistent with their family histories of breast

cancer, the FH+ Group had a lifetime objective breast cancer risk of 19.6%, significantly higher than the 11% for FH - Group ($F=6.90, p <.010$) (See Table 2).

Perception of personal risk for breast cancer

Hypothesis 1. The women will differ on personal risk of developing breast cancer.

As predicted, women in the FH+ Group were more likely to report a higher perception of personal risk than women in the FH- Group (Table 2). When asked to rate the "lifetime likelihood of developing breast cancer," Nearly one third of the FH+ Group rated their lifetime risk as greater than 50% , while less than one eighth of the FH- Group rated their chances as greater than 50%. An overall significant difference (chi-square = 10.60, $p <.005$).

The FH+ Group had also a significantly higher perception of risk when asked to rate their risks of developing breast cancer *compared to other same age women with similar histories of breast cancer* (See Table 2). When the FH+ Group compared themselves to other women, about 39% rated their chances of developing breast cancer as higher. Only about 28% of the FH- rated their chances as higher. Conversely, 39% of the FH- Group and about 14% of the FH+ Group rated their chances as "lower" than other women. This overall difference was significant (chi-square 7.41, $p <.025$).

Both the Family History Positive and Family History Negative Groups over estimated the lifetime risk of developing breast cancer for woman in the United States. The actual risk is 11%. Only 10% of the entire sample rated the average women's risk around 11%. In chi-square analysis, the Groups did not differ significantly on this question (See Table2).

These next analyses were to examine how FH+ women perceive their risk of other diseases. As shown in Table 2, only about one third of the FH+ rated their lifetime chance of developing heart disease *as high*, while over 50% of the FH- did. At the low end, about 70% of the FH+ rated their chances *as low*, compared to about 47% of the FH-. The overall difference was significant (chi-square = 5.017, $p < .025$). (See Table 2). Women in the FH+ Group rated their chance of developing breast cancer as higher than the FH- Group, but their chances of heart disease as lower compared to the FH- Group.

Intrusive thoughts

Hypothesis 2. The Groups will differ on intrusive and avoidant thoughts about breast cancer. The FH+ and FH- Groups did not differ significantly on intrusive thoughts and avoidance about breast cancer. Although the women in the FH+ were slightly more likely to have higher intrusive thoughts and avoidance than FH- Group, the differences were not significant (See Table 3).

Psychological distress

Hypothesis 3. The Groups will differ on general psychological distress (Brief Symptom Inventory -Global Severity Index, GSI). As shown in Table 3, the Groups did not significantly differ on general psychological distress (chi-square, $F=.187$, $p < .665$).

Hypothesis 4. The Groups will differ on BSE -specific distress. The women in the FH+ Group were significantly more likely to report higher BSE-specific distress than women in the FH- Group (chi-square= 6.155 , $p < .046$). As shown in Table 3, the percentage for the FH+ Group was 19.05% versus 3.64% for the FH- Group for women answering

"strongly agree."

Breast self-examination (BSE) behavior

Hypothesis 5. The Family History Groups will differ on BSE frequency.

BSE yearly. There were no significant differences found on BSE yearly between the FH+ and FH- Group (See Table 4). Briefly, the FH- Group was only slightly more likely than the FH+ Group to perform BSE according to ACS *yearly* guidelines - once a month (28.07 vs. 23.26%).

BSE Never - Yearly. Upon a closer analysis of the BSE frequency scores, it was found that the women in the FH+ were more likely to say "NEVER" on this question. It was of interest to see if the FH+ Groups significantly differed from the FH- in their "NEVER" answers. It was found over 23% (N=10) of the FH+ compared to only about 7% (N=4) of the FH- answer "NEVER" to the how often do you perform BSE in a year question. This difference was significant (chi-square = 5.31, $p < .021$) (See Table 4).

BSE over past three weeks. About half the women in the FH+ Group reported never doing BSE in the three-week interval while only about a quarter of the FH- Group failed to do so. In the over-performance category, 39.29% of the women in FH- Group compared to 27.91% of the women in the FH+ Group were over-performing BSE. In the "once" category, 37.50% of the FH- women, compared to 25.58% of the women in the FH+ Group performed BSE once. Again, the women in the FH+ Group were more likely to answer "NEVER" on short-term BSE (See Table 4). The difference was significant (chi-square=5.94, $p < .051$).

Psychological distress and BSE frequency

Hypothesis 6: Psychological distress (general, cancer-specific and BSE-specific) and perception of risk will affect BSE frequency. In these analyses, univariate effects of psychological distress were examined in the sample as a whole. In summary, perception of risk was unrelated to BSE-short term (chi-square 3.658, $p < .454$) or BSE long-term (chi-square = 4.328, $p < .363$). Similarly, general psychological distress was not related to BSE short-term (chi-square = .051, $p < .975$) or BSE long-term (chi-square = .519, $p < .468$). However, both cancer-specific distress (intrusive thoughts and avoidance) and BSE-specific distress was significantly related to BSE frequency.

Table 5 shows that avoidance affects BSE long-term BSE (chi-square = 4.498, $p < .034$). Specifically, at low levels of avoidance, fewer women were over performing long-term frequency, while at higher levels of avoidance more women were over performing BSE¹. Notice that the deviation in the under performer's cell is +5, while in the over performers' cell the deviation is -4. Table 6 shows that avoidance affects short-term BSE (chi-square = 7.046, $p < .008$). At low levels of avoidance, more women were underperforming BSE, while at high levels of avoidance women were over performing BSE. At low avoidance, the over performers' cell shows the frequency is 11 while the expected is 17. This suggests that at low levels of avoidance, women were under performing BSE (cell chi-square = 2.11). At high levels of avoidance, more women were over-performing BSE (cell chi-square = 2.11). For intrusive thoughts, Table 7 shows that at low levels of intrusive thoughts the model expected 17.68 women, while only 10 women were in the over performing BSE category (see cell chi-square 3.33),

¹ This was confirmed in manual calculations performed by Dr. Winkel.

suggesting that fewer than expected women were over performing BSE. At high levels of intrusive thoughts, more women (N=24) than expected (N = 16.32) were over performing short-term BSE (cell chi-square 3.614).

Another aspect of psychological distress not previously examined in the literature is BSE-specific distress. Table 8 shows that at low and at medium levels of BSE specific distress, the cell chi-squares are not significant. However, at high levels of BSE-specific distress women were significantly underperforming short-term BSE (chi-square 3.94, $p < .047$).

Hypothesis 7: The relationship between family history of breast cancer and BSE frequency will be mediated by psychological distress.

According to Barron and Kenny, (1986), a test of a mediational model requires certain facts of the data set be in place. In this data set, family history must be significantly related to BSE. Second, family history must be significantly related to psychological distress, and third, psychological distress must be significantly related to BSE. Family history was only related to short term BSE. Of the psychological distress variables, the FH Groups differed only on BSE-specific distress, and BSE-specific distress was related to short-term BSE. Therefore, family history, BSE-specific distress and short-term BSE were used in the mediational analysis. Table 9 depicts the results.

In the analysis, family history of breast cancer was entered first yielding significance at $p < .05$. Then BSE distress was entered and the model yielded significance at $p < .041$. When family history and BSE-specific distress were combined in the analyses, the results showed that the significance level for family history dropped to $p <$

.1208, suggesting that the relationship between family history and BSE frequency (at least short-term BSE) was mediated by psychological distress. Women with a family history of breast with high BSE specific-distress are more likely to under perform BSE frequency.

Part 2

A sub-group of women (N=67) from the sample answered questions relevant to African American Acculturation. In the results and discussion sections, these analyses will be referred to as Part 2.

Subject characteristics.

In this sub-sample 39 women had at least one first-degree relative with breast cancer, 28 women did not. Demographic variables for Part 2 were similar to those in Part 1 (See Table 10). Only one woman who completed all other questionnaires refused to complete the AAAS. Her data were excluded from these analyses.

African American Acculturation and BSE frequency

Hypothesis 8. African American acculturation will be related to BSE frequency.

Table 11 (for short-term BSE frequency) and Table 12 (for long-term BSE frequency) depict the results of a backwards elimination regression procedure. In the procedure, five African American acculturation sub-scales (Preference for African American Things, Beliefs, Interracial Attitude, Food and Social) were entered into the regression, and one by one are eliminated until the sub-scale that best predicts BSE remains. The results are laid out in a series of Steps.

Table 11 shows that in Step 0, the $F = 1.72$, $\text{Prob} > F = 0.1443$ suggesting that

with the five sub-scales, the model is not significant. The Preference for African American Things sub-scale comes close with an $F = 3.52$ and $p < .065$. The parameter estimates, individual F scores, and p values are also shown for each of the Steps.

In Step 1, Social is removed and the Preference sub-scale becomes significant $p < .039$. Step 2 shows that Belief is removed and the significance of Preference is $p < .043$. Step 3 shows that with just Food and Preference in the model, significance of Preference is $p < .078$. In the last step, Food is removed and the significance of Preference became $p < .015$. This suggests that of these five sub-scales, Preference is the best predictor of BSE short-term. These findings were confirmed in maximum R-square improvement regression analysis where Preference was the only predictor of BSE short-term $F = 6.19$, $p < .015$.

Similar to the results from BSE short-term analysis, Table 12 shows Preference was related to BSE long-term frequency, however, the Interracial Attitude sub-scale was also significant. In Step 0, the $F = 3.56$, $\text{Prob}>F = .0069$ suggesting that with all five sub-scales, the model is significant. The parameter estimates, individual F - scores and p values are also shown for Table 12. In Step 0, the Preference for African American Things sub-scale is significant with an $F = 4.17$ with $p < .045$. The Attitude sub-scale also comes close ($F = 3.06$, $p < .085$).

In Step 1, Social is removed first. Preference is significant ($p < .003$), and there is a trend for Attitude ($p < .074$). Step 2 shows that when Belief is removed, the significance of Preference is ($p < .006$) and Attitude becomes significant ($p < .034$). In the final, Step 3 shows that when Food is removed, Preference ($F = 13.06$, $p < .0006$) and

Attitude ($F = 5.23, p < .025$) remain in the model. This suggests that both Preference and Attitude predict BSE long-term. However, the parameter estimate for Preference is positive while the parameter estimate for Attitude is negative. This suggests that the Preference sub-scale is related to BSE over performance, while the Interracial Attitude sub-scale is related to BSE under-performance. These findings were confirmed in maximum R-square improvement regression analysis where Preference and Attitude were both predictors of BSE frequency ($F = 7.45, p < .0082$).

African American Acculturation, psychological distress and perception of risk

Hypothesis 9. Level of acculturation will be related to psychological distress and perception of risk.

Table 13 shows that the psychological distress and perception of risk variables were unrelated to the Preference for African American Things sub-scale or the Interracial Attitudes sub-scales. For variables that were dichotomized (e.g., lifetime risk of heart disease, intrusive thoughts, avoidance, general distress) logistic regression was used. For variables that were trichotomized (perception of risk of breast cancer, perception of risk compared to other women, BSE-specific distress) ANOVA was used.

African American Acculturation: Mediation

Hypothesis 10. The relationship between level of acculturation BSE frequency will be mediated by psychological distress. As the Preference for African American Things and Interracial Attitudes sub-scales did not relate to any of the psychological distress or to the perception of risk questions, the criteria necessary to test a mediation model was not met and therefore was not done.

Discussion

There were two major hypotheses underlying this research. The first was that women with a first-degree relative of breast cancer would significantly differ from women without a first-degree relative with breast cancer on psychological and behavioral outcomes. The second was that African American acculturation would have predictive value in understanding psychological distress and breast self-examination frequency.

Part One.

Part one compared Black women with at least one first-degree relative of breast cancer (FH+) with Black women without first-degree relatives (FH-) on measures of perception of risk, psychological distress and breast self-examination frequency (BSE). This was done to examine if women with a first-degree relative of breast cancer have higher psychological distress than women without a first-degree relative of breast cancer and if that higher psychological distress affects breast self-examination frequency. Prior studies with White women have found that psychological distress impacts on breast cancer screening (Kash et al., 1992; Lerman et al., 1994). The present study examined these relationships in Black women.

The first set of analyses compared the FH Groups on objective risk of developing breast cancer. The FH+ Group had a significantly higher objective risk (19.6%) than the FH- (11%) as calculated based on the algorithms of Claus et al., (1994). The risk for the average a woman in the US is about 11% (American Cancer Society, 1997). The FH+ women had at least one first-degree relative (FDR, e.g., mother, sister or daughter) diagnosed with breast cancer. Consistent with the possibility that having an FDR

diagnosed with breast cancer increases personal perception of risk of developing breast cancer, women in the FH+ Group rated their risk of developing breast cancer significantly higher than women in the FH- Group on both qualitative and quantitative measures of perception of risk. This finding is consistent with the higher perception of personal risk of developing breast cancer found among White women with an FDR with breast cancer (Evans et al., 1993; Valdimarsdottir et al., 1995; Zakowski et al., 1997), and confirms what has been found among Black women (Vernon et al., 1993).

To examine perception of risk in FH+ women on other diseases, women were asked about their perception of risk of developing heart disease. For example, it may have been that FH+ women rate their chances as higher for developing every disease, not just breast cancer. The risk of developing heart disease is significantly greater than the risk of developing breast cancer for most women and heart disease is the chief cause of death in American women (Legato et al., 1999). In this study, the FH+ Group rated their chances as significantly lower than the FH- Group on the perception of risk for heart disease question. This is consistent with a study that found twice as many women reported being worried about breast cancer as about heart disease (59% versus 29%) (Pilote & Hlatky, 1995). It may be that the FH+ Group believes that you cannot die of both breast cancer and of heart disease, it's either breast cancer or heart disease, since they believe they have a greater chance of developing breast than the general population, they can't have a high risk of dying of heart disease, too. This possibility remains to be tested in the future.

Intrusive thoughts and avoidance about breast cancer reflect cancer-specific distress that has been found to be high in White women with family histories of breast

cancer (Lerman et al., 1993). This higher cancer specific distress is found among FH+ women after notification of normal mammogram and when compared to FH- women (Zakowski et al., 1997; Valdimarsdottir et al., 1995). That finding was tested in this study, but not confirmed. When the FH+ women were compared with the FH- women, they exhibited higher cancer-specific distress, but the difference was not significant. This result may be because so many of the women in both Groups think about breast cancer, and believe that breast cancer is a serious disease. Though not used as germane to the paper, subjects were also asked to rate the seriousness of breast cancer on a scale ranging from 0 to 100. Answers for the sample ranged only from 94 to 100. Apparently, these women believe breast cancer is a very serious disease.

Finding that the FH Groups did not differ on cancer specific distress, that the sample believes breast cancer to be such a serious illness, and the such a high proportion of the sample believes the risk of developing breast cancer for the average US women exceeds 50%, may mean that media have done a very good job of making the public aware of breast cancer. The much reported "one in nine" statistic may have women, even those without a family history breast cancer, grossly overestimating their risk of breast cancer and having intrusive thoughts about breast cancer (Phillips et al., 1999). In a recent study that analyzed breast cancer coverage in women's magazines during the years 1987-1995, Marino & Gerlach (1999) found while popular magazines are a significant source of health information for many women, the risk factors for breast cancer were not discussed in proportion to their impact on risk. For example, the one in nine statistic was not explained as a lifetime average risk (Marion & Gerlach, 1999).

That may be part of the reason why in this study, at least 65% of the FH+ and 52% of the FH- Group answered affirmatively to having at least one intrusive thought about breast cancer during the three weeks prior to assessment. There are questions on the intrusion sub-scale such as: "thought about it when I didn't mean to" and "I had trouble falling asleep or staying asleep because of pictures or thoughts about it that came into my mind." Similarly, on the avoidance sub-scale, 65% of the FH+ and 65% of the FH- Group answered affirmatively to at least one avoidance question during the three weeks prior to interview. Questions on the avoidance sub-scale include such items as: "I stayed away from reminders of it" and "I tried not to think about it." Again, these answers are consistent with the entire sample's answers on the seriousness of breast cancer as a disease and the media's attention. But how does this relate to BSE frequency?

It may seem intuitive that women at high avoidance would underperform BSE, but not as clear why the high avoidance women would also over-perform BSE frequency. To understand this, it may be helpful to elaborate on the sub-scale items and the development of the measure avoidance sub-scale. The avoidance sub-scale taps "ideational constriction, denial of the meanings and consequences of the event, blunted sensation, behavioral inhibition or counter-phobic activity, and awareness of emotional numbness" (Horowitz, et al., 1979). The sub-scale is meant to assess the unconscious aspects of the denial process. It may be that women who are most anxious about developing breast cancer over-perform BSE to counteract their distress. Consistent with this, Epstein and Lerman (1997) have found that those FH+ women who are most likely to be excessive breast self-examiners are significantly more likely to think often or

always about breast cancer and to report that such thoughts affected their mood. The same may also be true of women without a first-degree relative with breast cancer. Moreover, in this data set, the intrusive thoughts' sub-scale and the avoidance sub-scale are highly correlated, ($p < .0001$).

Prior research has found that women with a family history of breast cancer have higher psychological distress (as measured by the BSI) than women without a family history of breast cancer (Gilbar, 1997). However, the present study did not confirm those findings. Women in the FH+ Group and those in the FH- Group had virtually the same amount of general distress, (GSI mean for the FH+ 53.49 versus mean for the FH- 49.12). It should be noted however, that in one study that found a difference, the subjects had suspected syndrome for breast cancer (Gilbar, 1997). The women with a family history of breast cancer in that study might be expected to score higher on measures of Somatization, depression and anxiety, three of the six sub-scales where significant differences were found. The almost equal levels of general distress between the Groups in the present study might also reflect the situation for American Black women. Indeed, in comparison to norms for the general population (Derogatis & Spencer, 1982), this sample answered above the average norms on all of the BSI sub-scales indicating that this sample of Black women had high levels of general distress. General distress was not related to having a family history of breast cancer or to BSE frequency. A more generic question for future research may be how does general distress differ between Black and White women and what are the implications for breast cancer screening?

Distress specific to BSE was also examined. Breast self-examination specific

distress has not been examined prior to this study. It was found that the FH+ women had significantly higher BSE-specific distress than the women in the FH- Group. The FH+ women were significantly more likely to answer that they were not performing BSE because they were afraid that something would be found. This became apparent later in the analysis examining BSE frequency. These results, however, need to be interpreted with caution as only a single item was used. Single item measures have previously been used with FH+ women and have yielded significant results. For example, Lerman & Schwartz, (1993) found that a single 4-point Likert-style item assessed the presence of breast cancer worries that interfered with daily functioning. The item used in the present study is a variation of a question used to predict why women do not go for regular mammograms (Rimer et al., 1991). The finding that FH+ women were significantly more likely to report not performing BSE because of being afraid that something would be found became apparent later in the analysis examining BSE frequency.

Overall, both Groups were performing BSE frequency at about the same long-term frequency. Upon closer examination, it was found that the FH+ Group was significantly more likely to not perform yearly BSE than the FH- Group. This finding may have to do with their greater BSE- specific distress. On the short-term BSE frequency question, the FH Groups significantly differed. More than 46% of the FH+ Group versus only about 23% of the FH- Group did not perform BSE during the prior three weeks. This supports what was found in the long-term BSE analysis that women in the FH+ Group were not performing BSE because of the fear of finding something. Both the short and long-term BSE questions were highly correlated. The fear that something

may be found is also a reason why some women don't get mammograms (Rimer et al., 1991).

As a number of studies with White women have found that psychological distress and perception of risk is related to breast cancer screening, it was of interest to examine how the psychological variables selected possibly affected BSE frequency in the entire sample.

Consistent with previous research, psychological distress did affect BSE frequency (See Tables 5, 6, 7, 8). Both low and high levels of intrusive thoughts and avoidance about breast cancer were related to BSE frequency. Women who performed BSE appropriately did not appear to be significantly affected by intrusive or avoidant thoughts. Given that the FH Groups did not differ on cancer-specific distress or long-term BSE frequency, it appears that intrusive thoughts about breast cancer is an important factor to consider for all women, regardless of family history. Yet another direction for future research would be to examine the role cancer-specific distress plays in screening in the general population.

As the literature suggests that having a family history of breast cancer increases psychological distress (Gilbar, 1997; Lerman & Schwartz, 1993; Valdimarsdottir et al., 1995; Zakowski et al., 1998), and that having a family history of breast cancer also impacts on breast cancer screening (Lerman & Schwartz, 1993), it was important to examine if the relationship between family history and BSE is mediated by psychological distress. Thus, the next set of analyses examined if the relationship found between family history of breast cancer and short term BSE frequency was mediated by

psychological distress. BSE-specific distress acted as the mediator.

According to Barron and Kenny's (1986) model of mediator relationship, the independent variable (IV) must be related to the mediator (MED) and the outcome variable (DV), and the mediator must be related to the outcome variable. In this instance, family history (IV) was related to both BSE-specific distress (MED) and to short-term BSE (DV); and, BSE-specific distress was related to BSE-short term (DV). These were the only variables in this data set that fit the criteria statistically and theoretically. If mediation is evident, the relationship between the IV and DV should disappear, or be significantly reduced once, the MED is introduced. This is what was found in these analyses. The finding that BSE distress mediated the relationship between family history and short-term BSE frequency sheds light on why the FH+ women are under performing BSE, at least short-term. This may have to do with the fact that these women were interviewed only three weeks after their visit to a cancer screening clinic and comes after they have received normal mammogram results in the mail or their doctor performed the clinical breast exam and said they were fine. Why go looking for trouble by performing BSE?

This study lends support to findings from Lerman and colleagues (1994) who found that higher levels of psychological distress among women with family histories of breast cancer were associated with both under- and over-performing breast self-examination behavior and Kash et al.'s (1992) finding that higher anxiety among women with a family history of breast cancer was related to poor adherence to monthly breast self-examination. Women in this sample at high and low levels of cancer specific distress

were both over and under performing BSE. Moreover, in this study the FH+ women were more likely than the FH- Group to underperform BSE in the short-term. If the idea of mediation is to test the "why" a main effect is found (Baron and Kenny, 1986), why the relationship between FH and BSE frequency was found is in part due to the FH+ Groups higher level of BSE-specific distress--the FH+ Group were more likely to under perform short-term BSE frequency because they were more likely to be afraid that something would be found. An avenue of future research may be to investigate other of psychological distress particular to Black women with family histories of breast cancer to better understand how psychological distress impacts on other cancer screening behaviors.

In sum, the family history groups differed on perception of risk breast cancer, risk of heart disease and BSE specific distress, the Groups did not differ on intrusive thoughts, avoidance or general distress. As for BSE frequency, the Groups differed only on short-term BSE frequency. When the sample was combined, low avoidance related to long and short-term BSE under and over performance. The same pattern was found for intrusive thoughts, but only for BSE short-term. High BSE specific distress was related to BSE short-term. BSE specific distress mediated the relationship between family history and BSE frequency. The second part examined how levels of African American acculturation might impact on BSE frequency in a sub-sample.

Part two.

Though acculturation is not a new construct, it had been applied to almost every other major ethnic group in the United States except African Americans prior to the

development of the African American Acculturation scale in 1996 (Landrine & Klonoff, 1996). Landrine and Klonoff (1996) suggest the reasons for this are because 1) psychology as a whole assumes that African Americans have little or no culture because it was destroyed during slavery (Jones, 1991); and, 2) psychology conceptualizes African Americans as a race, not as an ethnic or cultural group like other minorities (Jones, 1991; Yee et al., 1993).

The cultural measure used in this study was the first scale developed to assess acculturation among African Americans (Landrine & Klonoff, 1996). The 74-item scale is extensive and assesses eight dimensions of African American culture. In prior studies, the measure has been used as both as a global index and with individual sub-scales to predict health outcomes (Landrine et al., 1996). In the analysis for this paper, data from five sub-scales were first examined to determine the predictive value of the scale in assessing BSE frequency. Initial analyses revealed that demographics for the sub-sample of women (N=67) were similar to those in the larger data set and that when divided by family history of breast cancer, the women did not differ on demographics.

To reduce subject burden, when the study was first begun only some of the sub-scales and some of the items from those sub-scales were used. Subsequently, only five of the African American Acculturation sub-scales were used in the analysis. Backwards elimination regression analysis showed that, of the five sub-scales, only the Preference for African American Things and the Interracial Attitudes sub-scales were related to BSE frequency; Preference for short-term BSE and both Preference and Attitude for long-term BSE. The Preference sub-scale and the Attitude sub-scales were unrelated to

demographics.

It was found that women who are least like America mainstream (the women scoring higher on the Preference scale -- the more traditionally African American) were those most likely to over-perform BSE. This supports previous findings that Black women are more likely to over-perform BSE (Epstein et al., 1998). A good question is why are women who score higher on African American acculturation more likely to over-perform BSE?

The scale taps preferences for African American things. Questions include such items as: *"I feel more comfortable around Blacks than Whites," "The person I admire most is Black," "I try to watch all the Black shows on T.V.," "I listen to Black radio stations,"* and *"I read (or used to read) Essence or Ebony magazines."* There has been a concerted effort to increase breast cancer screening among minorities. For Black women who read and listen to media focusing on Blacks, it may be that the increased attention breast cancer has received lately is actually encouraging BSE over-performance. Many times messages about breast cancer screening are not accompanied by guidelines. The media's focus has been on raising awareness and increasing screening. Either the message to "do BSE" is not being heard, or *how often to do BSE* is not being conveyed or is missed. For example, one participant without a family history of breast cancer proudly announced to me "I phone my mother every day to ask her if she did her BSE, and if I don't call her, she calls me and asks me if I did mine." Though I informed her verbally and gave her a guideline and instruction booklet on BSE, I didn't get the feeling that she would change her routine. Not only is the information about frequency being missed,

notions about how breast cancer develop are also more likely to be misunderstood by Black women (Lannin et., at, 1998). For example, many Black women still believe that a blow to the breast can cause breast cancer and that having surgery if a lump is found will cause the cancer to grow (Lannin et al., 1998). This may have something to do with how Black women obtain their cancer information. Like White women, many Black women receive their cancer information from women's magazines. In the study mentioned earlier that analyzed breast cancer coverage in women's magazines (Marino & Gerlach, 1999), they found that magazines that targeted African American audiences had fewer breast cancer articles than the White women's magazines. They also found that the women's magazines in general, not just the Black ones, while heightening breast cancer awareness, neglected to explain breast cancer risk. The Black magazines analyzed were Ebony, Essence, and Jet. Two of the magazines are mentioned by name on the African American Acculturation Scale as examples of prototypical African American magazines. Table 15 shows the individual item correlation for the Preference sub-scale. Preference items that relate to the media are those that are significantly correlated with short and long-term BSE frequency. The media campaigns that have focused so diligently on breast cancer awareness perhaps can now turn to educating a frightened public about prevention strategies (such as diet, reduced alcohol and caffeine consumption, etc.), proper screening techniques (eg., how to do BSE, what to expect during a mammogram, etc.) and appropriate screening guidelines (ex., when to have a mammogram and CBE, and how often to perform BSE). Only 66% of the articles analyzed by Marino and Gerlach (1999) presented the American Cancer Society screening guidelines. It was unclear from the

article what percentage of the Black magazine's gave the ACS guidelines.

The flip-side is that in the backwards elimination procedure, the Interracial Attitudes sub-scale was related to long-term BSE under-performance. That sub-scale was designed to assess attitudes about Whites and White institutions that are known as "cultural mistrust" (Landrine & Klonoff, 1996). Examples of items on the scale include "*I don't trust most White people,*" "*Deep in their hearts, most White people are racist,*" and "*IQ tests were set-up to purposefully to discriminate against Black people*". This sub-scale has been used in prior research and found to be related to level of knowledge regarding risk behaviors associated with AIDS (Klonoff & Landrine, 1997). Consistent with AIDS knowledge and levels of acculturation among Hispanics (Epstein, Dusenbury, Botvin, & Diaz, 1994), Klonoff & Landrine (1997) found that African Americans who were least acculturated were the most distrustful of Whites and those who knew the least about risks behaviors that cause AIDS. Those researchers suggest that a history of racism and cultural mistrust may cause more traditional African Americans to reject information put forth by Whites. However, in the individual item correlations, the items individually did not reach significance. The Preference and Attitude sub-scale are highly correlated (actual correlation $p < .0001$). Not finding that the Attitude items individually related to BSE may mean that the sub-scale best predicts under-performance in a model with Preference.

The possibility that the relationship between acculturation and BSE frequency would be mediated by psychological distress (e.g., perception of risk, intrusive and avoidant thoughts, general distress, BSE-specific distress) was considered. However, the

psychological variables selected for this study were found to be unrelated to scores on the Preference for African American Things sub-scale. Thus, there was no evidence to support the mediation hypothesis. That is not to say that African American acculturation is necessarily unrelated to every psychological instrument. One reason why a relationship was not found is perhaps because the AAAS sub-scales might assess psychological and behavioral outcomes differently. For example, in Landrine and Klonoff's (1996) research, smokers scored higher (more traditionally African American) than non smokers on four of the sub-scales (Foods, Attitudes, Beliefs and Superstitions), while hypertensive African Americans scored higher on the Social and Foods sub-scales. So while Preference may be related to BSE frequency and possibly other behavioral outcomes not assessed in this study, another one of the AAAS sub-scales might be a better predictor of psychological outcomes. As only 36 women completed all eight sub-scales, it would be unfair to Landrine and Klonoff's work to say that African American acculturation is unrelated to psychological outcomes. The finding that the Preference and Attitude sub-scales were related to BSE supports the notion that the AAAS is related to behavioral outcomes in African American women. Determining which sub-scales assess cancer-specific BSE-specific and general distress is warranted in future research with a larger sample size.

In sum, only the Preference for African American Things sub-scale and Interracial Attitude sub-scales were related to BSE short and BSE long-term frequency in the sub-sample. It was found that women scoring higher on the Preference sub-scale were more likely to over perform long and short-term BSE frequency while women scoring high on

the Interracial sub-scale were more likely to underperform long-term BSE. While the Preference and Interracial attitude sub-scales were related to BSE frequency, they did not relate to the psychological variables. Thus, a test of a mediational model was not warranted.

Conclusions

It is reported by some researchers that 75% of all cancer deaths in the US potentially can be avoided by eliminating or reducing cancer risk factors (Lerman et al., 1989). That statistic is more apropos of tobacco-related cancer deaths than of breast cancer. In the fight against breast cancer, early detection is the best defense. Amazingly, if detected at stage 1-- a time when no cancerous lymph nodes are present--about 90% of breast cancers can be "cured" (Wertheimer et al., 1986). Moreover, programs which utilize mammography and a clinical breast exam can help reduce breast cancer mortality by as much as 35% (Wertheimer et al., 1986). Despite the success of early detection methods, acceptance of mammography remains below the recommendations of the National Cancer Institute (NCI) and other organizations (Wertheimer et al., 1986), especially for Black women. Though this is changing, low participation in breast screening programs continues to be a major factor contributing to health problems. Only 54.9% of Black women over 50 report having a mammogram (American Cancer Society, 1997). It would be ironic if the tremendous attention the media has given to breast cancer while raising awareness, may have also raised levels of perception of risk and cancer-specific distress that may have a negative effect on screening. As higher cancer-specific distress was related to both under and over performance in this sample, it may be that

women in the general population with the highest levels of perception of risk and cancer-specific distress may also be those most likely to avoid important messages about breast cancer screening, for example, a message like BSE should be performed, but only once a month. Women with the highest distress may also be those least likely to come in for mammography screening. However, that cannot be determined from this study as women were recruited from a clinic that performs mammograms, CBEs, and gives instruction on how to perform BSE to its clients. One direction for future research is to examine how cancer-specific distress and perception of risk affects screening in the general population. Yet, even in this sample, perception of lifetime risk was overestimated in both the FH+ and FH- Groups and cancer-specific distress was found to be related to BSE over and under performance. Messages about breast cancer screening could best benefit women if they were also tailored to allay breast cancer anxieties.

Initiatives that seek to increase early detection and reduce mortality among Black women should focus on increasing knowledge, efficacy, advocacy and reducing treatment cost (Long, 1993). Community health programs across the United States that give instruction on how to perform breast self-exam (BSE), offer low cost or free clinical breast exams (CBE) and mammography, and utilize mobile cancer screening units have been the most effective (Long, 1993). Physicians play an important role in the use of breast cancer screening methods, especially among older, Black women (Caplan et al., 1992; Danigelis et al., 1996), thus, a variety of educational programs and practice interventions should target physicians (Lerman et al., 1989).

The role culture plays in understanding breast cancer screening practices among

African- Americans is yet another avenue warranting further research in trying to understand the screening practices of African Americans. As this study provides support for the notion that the AAAS is predictive of BSE frequency in African American women, future research can begin to examine ways to use what has been learned to increase appropriate screening. Direct interventions tailored to African Americans is but one way. Using the Black media to dispense knowledge about appropriate screening is another.

Future research.

Very few studies have compared Black women with White women on the measures used in this study. Thus, it is not clear if Black women with a family history of breast cancer perceive their risk of developing breast cancer as higher than White women with similar histories, or if FH+ Black women are having more intrusive thoughts about breast cancer than their White counterparts. A challenge will be to control for socioeconomic as well as cultural differences in such studies in the future.

Other lines of research might include studies designed to assess 1) how well the AAAS might help us understand other cancer screening behaviors (e.g., pap smear, colorectal, and mammography) in African American women; 2) how the AAAS, along with racism and cultural mistrust, might interact to predict breast and other cancer screening behavior in African American women; and, 3) how the AAAS, racism and cultural mistrust might interact to predict Black women's attitudes toward breast cancer genetic counseling and testing.

Medical technology is rapidly moving toward identifying newer and better ways

to detect breast cancer early. It is important that those services are also maximized by those who might be the most afraid, least trusting, and most vulnerable to cancer. Ensuring that necessary information is conveyed in an understandable, culturally sensitive and non-anxiety provoking manner may increase the likelihood that the information is accepted and acted upon by African American women.

Table 1. Demographic Characteristics

	Family History Groups	
	FH+ Group (N=43)	FH- Group (N=57)
Mean Age (SD)	46.31	44.80
Completed High School	86.05%	82.46%
Income (\$10,000-\$39,999)	58.14%	66.67%
Employed Part- or Full-time	63.41%	65.45%
Currently married	34.88%	24.56%
Living w/spouse or partner	30.23%	35.09%
Living w/children no partner	23.26%	24.56%

No significant differences were found

Table 2. Comparison of Family History Groups on Objective Risk and Perception of Risk

	FH+ Group (N=43)	FH- Group (N=57)	Significance
<u>Objective Risk of Developing Breast Cancer</u>			
Claus score (M=14.80 S/D=7.53)	19.60%	11.00%	< .010
<u>Perception of Breast Cancer Risk</u>			
Quantitative Response (% Reporting)			
<i>Less than 50%</i>	23.26% (N=10)	52.63% (N=30)	
<i>Equal to 50%</i>	44.19% (N=19)	35.09% (N=20)	
<i>Greater than 50%</i>	32.56% (N=14)	12.28% (N= 7)	< .005
Qualitative Response (% Reporting)			
<i>Higher</i>	39.53% (N=17)	27.78% (N=15)	
<i>The same</i>	46.51% (N=20)	33.33% (N=18)	
<i>Lower</i>	13.95% (N= 6)	38.89% (N=21)	<.025
Knowledge of Breast Cancer Risk (% Reporting)			
<i>Less than 50%</i>	27.91% (N=12)	35.09% (N=20)	
<i>Equal to 50%</i>	20.93% (N= 9)	28.07% (N=16)	
<i>Greater than 50%</i>	51.16% (N=22)	36.84% (N=21)	n.s.
<u>Perception Heart Disease Risk</u>			
Quantitative Response (% Reporting)			
<i>Less than 50</i>	69.77% (N=30)	47.37% (N=27)	
<i>Greater than or equal 50</i>	30.23% (N=13)	52.63% (N=30)	<.025

Table 3. Comparison of Family History Groups on Psychological Outcomes

	FH+ Group (N=43)	FH- Group (N=57)	Significance
<u>Intrusive thoughts (sub-scale of IES)</u>			
Intrusive $\geq 3^a$	53.49% (N=23)	43.86% (N=25)	
Intrusive $< 3^a$	46.51% (N=20)	56.14% (N=32)	n.s.
<u>Avoidance (sub-scale of the IES)</u>			
Avoidance $\geq 4.5^a$	58.14% (N=25)	43.86% (N=25)	
Avoidance $< 4.5^a$	41.86% (N=18)	56.14% (N=32)	n.s.
<u>General distress (GSI)</u>			
GSI $\geq .471^a$	53.49% (N=23)	49.12% (N=28)	
GSI $< .471^a$	46.51% (N=20)	50.88% (N=29)	n.s.
<u>BSE-specific distress</u>			
High	19.05% (N= 8)	3.64% (N= 2)	
Medium	11.90% (N= 5)	12.73% (N= 7)	
Low	69.05% (N=29)	83.64% (N= 46)	.046

^aMedian split

Table 4. Comparison of Family History Groups on Breast-Self Examination Behavior (BSE)

	FH+ Group (N=43)	FH- Group (N=57)	Significance
<u>Breast self-examination over the past year</u>			
More than once a month	30.23% (N=13)	29.82% (N=17)	n.s.
Once a month*	23.26% (N=10)	28.07% (N=16)	
Less than once a month	46.51% (N=20)	42.11% (N=24)	
<u>Did not perform BSE - past year</u>			
Never	23.26% (N=10)	7.02% (N= 4)	.021
Everyone else	76.74% (N=33)	92.98% (N=53)	
<u>Breast self-examination over the past three weeks</u>			
More than > 2 times	27.91% (N=12)	39.29% (N=22)	.051
Only once	25.58% (N=11)	37.50% (N=21)	
Never	46.51% (N=20)	23.21% (N=13)	

*The American Cancer Society recommends that women over 20 perform BSE once a month

Table 5. Avoidance as a predictor of long-term BSE frequency

Avoidance	Under performers	Appropriate Performers	Over Performers		
Frequency	27	12	11	N = 50	
Expected	22	13	15		
Deviation	5	-1	-4		
Cell chi-square <i>Low</i>	1.1364	0.0769	1.0667		
Percent <i>Avoidance</i>	27.00	12.00	4.00		50.00
Row pct	54.00	24.00	11.43		
Col pct	61.36	46.15	13.33		
Frequency	17	14	19	N = 50	
Expected	22	13	15		
Deviation	-5	1	4		
Cell chi-square <i>High</i>	1.1364	0.0769	1.0667		
Percent <i>Avoidance</i>	17.00	14.00	19.00		50.00
Row pct	34.00	28.00	38.00		
Col pct	38.64	53.85	63.33		
	N = 44	N = 26	N = 30	N = 100	

Cochran-Mantel-Haenszel Statistics (Modified Ridit Scores)
 Statistic Alternative Hypothesis DF Value Prob

1	Nonzero Correlation	1	4.498	0.034
2	Row Mean Scores Differ	1	4.498	0.034
3	General Association	2	4.514	0.105

Table 6. Avoidance as a predictor of Short-term BSE frequency

Avoidance	Under performers	Appropriate Performers	Over Performers	
Frequency	22	17	11	N = 50
Expected	17	16	17	
Deviation	5	1	-6	
Cell chi-square <i>Low</i>	1.4706	0.0625	2.1176	
Percent <i>Avoidance</i>	22.00	17.00	11.00	50.00
Row pct	44.00	34.00	22.00	
Col pct	64.71	53.13	32.35	
Frequency	12	15	23	N = 50
Expected	17	16	17	
Deviation	-5	-1	6	
Cell chi-square <i>High</i>	1.4706	0.0625	2.1176	
Percent <i>Avoidance</i>	12.00	15.00	23.00	50.00
Row pct	24.00	30.00	46.00	
Col pct	35.29	46.88	67.65	
	N = 34	N = 32	N = 34	N = 100

Cochran-Mantel-Haenszel Statistics (Modified Ridit Scores)

Statistic Alternative Hypothesis DF Value Prob

1	Nonzero Correlation	1	7.046	0.008
2	Row Mean Scores Differ	1	7.046	0.008
3	General Association	2	7.228	0.027

Table 7. Intrusive thoughts as a predictor of short-term BSE frequency

Intrusive thoughts	Under performers	Appropriate Performers	Over Performers	
Frequency	23	19	10	N = 52
Expected	17.68	16.64	17.68	
Deviation	5.32	2.36	-7.68	
Cell chi-square <i>Low</i>	1.6008	0.3347	3.3361	
Percent <i>Intrusive</i>	23.00	19.00	10.00	52.00
Row pct <i>Thoughts</i>	44.23	36.34	19.23	
Col pct	67.65	59.38	29.41	
Frequency	11	13	24	N = 48
Expected	16.32	15.36	16.32	
Deviation	-5.32	-2.36	7.68	
Cell chi-square <i>High</i>	1.7342	0.3626	3.6141	
Percent <i>Intrusive</i>	11.00	13.00	24.00	48.00
Row pct <i>Thoughts</i>	22.92	27.08	50.00	
Col pct	32.35	40.63	70.59	
	N = 34	N = 32	N = 34	N = 100

Cochran-Mantel-Haenszel Statistics (Modified Ridit Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	9.858	0.002
2	Row Mean Scores Differ	1	9.858	0.002
3	General Association	2	10.873	0.004

Table 8. BSE- specific distress as a predictor of short-term BSE frequency

Intrusive thoughts	Under performers	Appropriate Performers	Over Performers	
Frequency	22	27	26	N = 75
Expected	26.289	24.742	23.969	
Deviation	-4.289	2.2577	2.0309	
Cell chi-square <i>Low</i>	0.6996	0.206	0.1721	
Percent <i>BSE</i>	22.68	27.84	26.80	77.32
Row pct <i>Distress</i>	29.33	36.00	34.67	
Col pct	64.71	84.38	83.87	
Frequency	5	4	3	N = 12
Expected	4.2062	3.9588	3.8351	
Deviation	0.7938	0.0412	-0.835	
Cell chi-square <i>Medium</i>	0.1498	0.0004	0.1818	
Percent <i>BSE</i>	5.15	4.12	3.09	12.37
Row pct <i>Distress</i>	41.67	33.33	25.00	
Col pct	14.71	12.50	9.68	
Frequency	7	1	2	10
Expected	3.5052	3.299	3.1959	
Deviation	3.4948	-2.299	-1.196	
Cell chi-square <i>High</i>	3.4846	1.6021	0.4475	
Percent <i>BSE</i>	7.22	1.03	2.06	10.31
Row pct <i>Distress</i>	70.00	10.00	20.00	
Col pct	20.59	3.13	6.45	
	N = 34	N = 32	N = 31	N = 97

Statistic	Alternative Hypothesis	DF	Value	Prob	(Cochran-Mantel-Haenszel Statistics Modified Redit Scores)
1	Nonzero Correlation	1	3.942	0.047	
2	Row Mean Scores Differ	2	4.452	0.108	
3	General Association	4	6.872	0.143	

Table 9: Test of the Mediation Model: Relationship Between Family History and BSE Frequency Mediated by Psychological Distress

Source	DF	SS	Mean Square	F Value	Pr > F
Model	1	2.61117911	2.61117911	3.91	.0507
Error	98	65.38882089	0.66723287		R-Square 0.038400
Corrected Total	99	68.00000000			
Parameter	Estimate		Parameter=0	Pr > T	Std Error of Estimate
Family History	-0.326397389		-1.98	0.0507	0.16499359
Source	DF	SS	Mean Square	F Value	Pr > F
Model	1	2.78238364	2.78238364	4.25	0.0419
Error	95	62.12483286	0.65394561		R-Square 0.042867
Corrected Total	96	64.90721649			
Parameter	Estimate		Parameter=0	Pr > T	Std Error of Estimate
BSE Distress	-0.160553964		-2.06	0.0419	.07783651
Source	DF	SS	Mean Square	F Value	Pr > F
Model	2	4.36141113	2.18070556	3.39	.0380
Error	94	60.54580537	0.64410431		R-Square 0.067195
Corrected Total	96	64.90721649			
Source	DF	Type I SS	Mean Square	F Value	Pr > F
BSE- Distress	1	2.78238364	2.78238364	4.32	.0404
Family History	1	1.57902749	1.57902749	2.45	.1208
Source	DF	Type III SS	Mean Square	F Value	Pr > F
BSE Distress	1	1.87107775	1.87107775	2.90	.0916
Family History	1	1.57902749	1.57902749	2.45	.1208

Table 10. Demographic characteristics: Part 2

	Family History Groups	
	FH+ Group (N=28)	FH- Group (N=39)
Mean Age (SD)	46.23 (10.21)	44.12 (11.09)
Education (H.S. Graduate)	84.62%	85.71%
Income (\$10,000-\$39,999)	57.14%	64.10%
Employed Part or Full-time	59.26%	70.27%
Currently married	34.95%	27.83%
Living w/spouse or partner	28.21%	28.57%
Living w/children no partner	28.21%	25.00%

No significant group differences were found.

Table 11. African American Acculturation and Short-Term Breast Self-Examination Frequency (N=67)

All variables entered	DF	Sum of Squares	Mean Square	F	Prob<F
Regression	5	5.80	1.159	1.72	0.1443
Error	61	41.19	0.675		
Total	66	46.99			

R-square = .123

Sub-Scale	Parameter Estimate	Standard error	Type II SS	F	Prob<F
Preference	.213	.011	2.37	3.52	.065
Attitude	-.010	.011	.509	.75	.388
Beliefs	-.010	.023	.146	.22	.643
Social	-.003	.026	.009	.01	.905
Food	.184	.017	.768	1.14	.290

	Parameter Estimate	Standard Error	SS	F	Prob<F
Step 1. Social removed					
Preference	.020	.009	2.94	4.43	.039
Step 2. Belief removed					
Preference	.019	.009	2.79	4.25	.043
Step 3. Attitude removed					
Preference	.014	.007	2.10	3.21	.078
Step 4. Food removed					
Preference	.018	.007	4.08	6.19	.015

Table 12. African American Acculturation and Long-Term Breast Self-Examination Frequency (N=67)

All variables entered	DF	SS	Mean Square	F	Prob<F
Regression	5	11.55	2.31	3.56	0.0069
Error	61	39.63	0.68		
Total	66	51.19			

R-square = .225

Sub-Scale	Parameter Estimate	Standard error	Type II SS	F	Prob<F
Preference	.022	.011	2.70	4.17	.045
Attitude	-.019	.011	1.99	3.06	.085
Beliefs	-.029	.023	1.02	1.58	.212
Social	-.030	.026	.892	1.37	.245
Food	.020	.017	.957	1.47	.229

	Parameter Estimate	Standard Error	SS	F	Prob<F
Step 1. Social removed					
Preference	.029	.009	5.86	8.97	.003
Attitude	-.020	.011	2.15	3.29	.074
Step 2. Belief removed					
Preference	.026	.009	5.21	7.93	.007
Attitude	-.023	.010	3.07	4.67	.034
Step 3. Food removed					
Preference	.031	.008	8.66	13.06	.0006
Attitude	-.025	.011	3.46	5.23	.025

Table 13. African American Acculturation and Trichotomized Psychological Variables (N=67)

Measure	Preference for African American Things Mean (SD)*	Interracial Attitudes Mean (SD)*
Perception of personal risk of breast cancer		
Less than 50% (N=21)	47.99 (15.13)	23.45 (9.80)
Equal to 50% (N=18)	49.61 (15.34)	49.61 (11.10)
Greater than 50% (N=28)	50.11 (11.94)	50.11 (11.57)
Perception of risk, compared to others		
Higher (N=16)	47.84 (15.92)	25.69 (10.17)
The Same (N=26)	52.72 (9.57)	28.29 (10.09)
Lower (N=23)	46.65 (16.23)	27.31 (12.40)
BSE-specific distress		
Low (N=51)	48.69 (14.12)	25.24 (10.73)
Medium (N=8)	51.63 (10.98)	34.37 (8.78)
High (N=5)	45.30 (15.53)	28.71 (12.60)

*No significant differences were found

Table 14. African American Acculturation and Dichotomized psychological variables (N=67)

Measure	Preference for African American Things	Interracial Attitudes
Intrusive thoughts^a (Above N=31 Below N=36) <i>Parameter estimate</i> <i>Standard error</i> <i>Pr > Chi-square</i>	.0052 .0217 .8106*	-.0139 .0272 .6100*
Avoidance^a (Above N=32 Below N=35) <i>Parameter estimate</i> <i>Standard error</i> <i>Pr > Chi-square</i>	.0207 .0222 .3517*	-.0143 .0273 .2740*
General distress^a (Above N=32 Below N=35) <i>Parameter estimate</i> <i>Standard error</i> <i>Pr > Chi-square</i>	-.0099 .0219 .6484*	.0254 .0275 .3557*
Likelihood heart disease (Greater than 50% N=33 Less than 50% N=34) <i>Parameter estimate</i> <i>Standard error</i> <i>Pr > Chi-square</i>	.0194 .0224 .3861*	.0141 .2639 .6074*

^a Median split

*Not significant

Table 15. Individual item correlation: Preference for African American Things with BSE

Preference for African American Things	Short term BSE	Long-term BSE
I know how to play bid whist.	.570	.180
Most of my friends are Black.	.090	.196
I feel more comfortable around Blacks than around Whites.	.529	.691
I listen to Black radio stations.	.008	.002
I try to watch all the Black shows on TV.	.038	.088
I read (or used to read) <i>Essence</i> magazine.	.034	.002
Most of the music I listen to is by Black artists.	.077	.040
I like Black music more than White music.	.885	.853
The person I admire the most is Black.	.040	.034
When I pass a Black person (a stranger) on the street, I always say hello or nod at them.	.866	.598
I read (or used to read) <i>Jet</i> magazine.	.013	.005

Table 16. Individual Item Correlation: Interracial Attitude with BSE Frequency

Interracial Attitudes*	Short-term BSE	Long-term BSE
Most tests (like the SATs and tests to get a job) are set-up to make sure that Blacks don't get high scores on them.	.497	.688
Deep in their hearts, most White people are racists.	.803	.603
IQ tests were set-up purposefully to discriminate against Black people.	.291	.737
Whites don't understand Blacks.	.560	.159
Some members of my family hate or distrust White people.	.860	.996
I don't trust most White people.	.579	.994
Most Whites are afraid of Blacks.	.296	.63

*No significant correlations were found

Table 16. Summary of Results

Part 1

- FH+ women had a higher objective risk of developing breast cancer, higher perception of risk of developing breast cancer, and lower perception of risk of developing heart disease than FH- women
- FH+ and FH- women did not differ on intrusive thoughts, avoidance or general distress
- FH+ and FH- women differed on BSE-specific distress
- FH+ and FH- women differed only on short-term BSE frequency—FH+ women were more likely to under perform BSE frequency
- When the FH+ and FH- Groups were combined, women scoring both *higher and lower* on the Impact of Events Scale sub-scales were those less likely to perform BSE according to recommended guidelines—they either under or over-performed BSE frequency
- Women scoring higher on BSE-specific distress were more likely to under-perform BSE frequency
- BSE-specific distress mediated short-term BSE frequency

Part 2

- Of the five sub-scales used from the African American Acculturation Scale, only the Preference for African American Things sub-scale was related to short-term BSE frequency
- Both the Preference for African American Things and the Interracial Attitude sub-scales were related to long-term BSE frequency
- Preference for African American Things and the Interracial Attitude sub-scales were unrelated to the psychological variables selected

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