RACIAL DIFFERENCES IN MAGAZINE COVERAGE OF MAMMOGRAPHY

By
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A thesis submitted to The Johns Hopkins University
in conformity with the requirements for the degree of Master of Arts

COMMUNICATION IN CONTEMPORARY SOCIETY

Baltimore, Maryland
May 2008

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Abstract

This study examined messages regarding mammography in mass circulation African-American and European-American women’s magazines. There were significant differences in the content of African-American and European-American magazines. African-American magazines had a higher grade level, more difficult readability, and more passive sentences. Further, the African-American magazines contained more references to religiosity, activity, positive and negative emotions, risk factors, and racial references than their European-American counterparts. It can be proposed that African-American women view mammography, and perhaps many other health issues, from a weltanschauung of deep emotions, strong religious beliefs, and an abiding faith in their special status in the world --- that their survival from cancer rests in God’s hands. These findings have important implications for communicating information regarding mammography to African-American women.

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Preface

Acknowledgments

I would like to thank Dr. Harry B. Burke for his mentoring and for always believing in me. I am grateful to Dr. Erika S. Falk for her excellent advice. I would also like to extend my appreciation to friends and classmates, especially Erica V. Jefferson, for their encouragement. Finally, I wish to express my deepest gratitude to my husband, Steven M. Petrak, for his moral and financial support of my studies at The Johns Hopkins University (JHU), and my son, Zachary R. Petrak, for providing the inspiration to continue my education.
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Introduction

Breast cancer is a woman’s most common and feared cancer. It strikes one in eight United States (U.S.) women (Breast Cancer Facts and Figures, 2005-2006). Mammography detects breast cancer at an early stage. African-American women are diagnosed later, at a higher stage disease, and have a higher mortality than European-American women (Breast Cancer Facts and Figures). Not only is there a racial disparity in the disease and death from breast cancer, there is a racial disparity in the rate of mammography screening and, as a result, in the early detection of breast cancer, when it is curable (Breast Cancer Facts and Figures). African-American women have a lower rate of mammography screening than European-American women and this lower rate may account, in part, for African-American women’s more severe disease at diagnosis and higher mortality (Breast Cancer Facts and Figures).

One possible reason for this racial disparity in mammography screening rates may be that African-American women receive a different message than European-American women from mass circulation magazines about mammography. I hypothesized that African-American women receive different messages regarding mammography from mass circulation women’s magazines than European-American women. An implication of this research is that, if the messages are different, and the differences can be identified, then the messages can be changed and African-American lives can be saved.

Breast Cancer

Cancer is a disease that causes cells to mutate, grow out of control, and metastasize to surrounding tissue (Hunter, 1998). Cancer is named after the body part where the tumor originates; hence, breast cancer originates in breast tissue. Most types of cancer cells form a
painless mass, a tumor (Herzenberg, Lenhard, & Osteen, 2001). Because pain is rarely a sign of breast cancer, it can go undetected without screening (Love & Lindsey, 1995).

Approximately 212,920 new cases of invasive breast cancer and 40,970 deaths were expected to occur among U.S. women in 2006 (Cancer Facts & Figures, 2006). As of January 2002, approximately 2.3 million American women were living with breast cancer (Breast Cancer Facts & Figures, 2005-2006). Breast cancer is the most frequently diagnosed cancer in women in every U.S. racial and ethnic group, including European-American, African-American, Hispanic-American, American Indian/Alaska Native, and Asian-American women.

Risk of Breast Cancer

A risk factor is anything that increases an individual’s chance of being diagnosed with a disease (Breast Cancer: A Resource Guide for Minority Women, May 2005). The risk of breast cancer is not the same for all women. Age increases a woman’s chance of invasive breast cancer. The National Cancer Institute (NCI) reported that the risk of breast cancer is: “1 in 257 for women ages 30 to 39; 1 in 67 for women ages 40 to 49; 1 in 36 for women ages 50 to 59; 1 in 28 for women 60 to 69 and 1 in 24 for women ages 70 to 80” (Breast Cancer: A Resource Guide for Minority Women, May 2005, p. 3) resulting in a cumulative risk of 1 in 8 women being diagnosed with the disease. In contrast, men are at low risk for breast cancer; it represents less than 1% of male malignancies (Love & Lindsey, 1995).

Both modifiable and non-modifiable factors affect a woman’s risk of being diagnosed with breast cancer. Non-modifiable risk factors that increase a woman’s risk are age, family history of breast cancer, gender, genetic risk factors, menstrual periods,
personal history of breast cancer, previous breast radiation, and race (Breast Cancer: A Resource Guide for Minority Women, May 2005). Modifiable risk factors that increase her risk include alcohol use, combination hormone replacement therapy (estrogen and progesterone, not estrogen alone), obesity, high-fat diets, and smoking (Breast Cancer: A Resource Guide for Minority Women). Further, not bearing children or breastfeeding and/or a late first pregnancy (over 30 years) increases a woman’s risk of breast cancer (World Cancer Research Fund, 2007).

**Mammography**

A mammogram is a radiograph (x-ray) of the breast (Friedewald, Buzdar, & Bokulich, 1997; Breast Cancer Facts & Figures, 2005-2006). Like all x-rays, it visualizes the internal structures of the body. Mammograms reveal calcifications and other breast abnormalities.

The American Cancer Society (ACS) (Breast Cancer Facts & Figures, 2005-2006) acknowledged that, as a diagnostic test, the mammogram is not perfect because mammography does not detect every breast cancer. However, it can detect approximately 80% to 90% of the symptom-free breast cancers and it is better than any other test for breast cancer. In other words, a regularly scheduled mammogram is the most effective screening test for the early detection of breast cancer due to its ability to detect cancer before the patients are symptomatic (Breast Cancer Facts & Figures).

The screening mammogram procedure begins with the mammography technician placing a woman’s bare breast between two plastic or metal plates on the mammography machine. The top plate is then lowered and the breast is compressed. The procedure, which only takes a few minutes, is then repeated on the other breast. The breasts must be
tightly compressed to produce a clear image. The two negative aspects of a mammogram are that the woman receives radiation to her breasts, which may induce genetic changes that give rise to breast cancer, and the compression can produce pain (Sharp et al., 2003).

Mammograms are more accurate when screening less dense tissue (Breast Cancer Facts & Figures, 2005-2006). Breast density decreases with menopause because after menopause breast tissue involutes leaving only fatty tissue (Henson, Tarone, & Nsouli, 2006). Thus, mammography is a more accurate test for postmenopausal women than for pre-menopausal women.

There are two types of mammograms: screening and diagnostic (Understanding Breast Changes: A Health Guide for Women, 2004). A screening mammogram includes two views of each breast: a top and a side view. A diagnostic mammogram requires additional views that produce more detailed pictures and is usually performed in patients who are symptomatic or who have had an abnormal mammogram. This paper is concerned with screening rather than diagnostic mammography.

Mammography Guidelines

The most important action a woman can take to reduce her risk of dying from breast cancer is to follow the national guidelines for mammography screening (Cancer Prevention & Early Detection Facts & Figures, 2004). The mammography screening guidelines of the leading medical organizations are shown in Table 1.
Table 1. Mammography Screening Guidelines

<table>
<thead>
<tr>
<th></th>
<th>National Cancer Institute (NCI)&lt;sup&gt;1&lt;/sup&gt;</th>
<th>American Cancer Society (ACS)&lt;sup&gt;2&lt;/sup&gt;</th>
<th>U.S. Preventive Services Task Force (USPSTF)&lt;sup&gt;3&lt;/sup&gt;</th>
<th>American College of Obstetricians and Gynecologists (ACOG)&lt;sup&gt;4&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of guideline</td>
<td>2006</td>
<td>2007</td>
<td>2007</td>
<td>2003</td>
</tr>
<tr>
<td>Age at first regular mammogram</td>
<td>40 years old</td>
<td>40 years old</td>
<td>40 years old</td>
<td>40-49 years of age</td>
</tr>
<tr>
<td>Time interval between regular mammograms</td>
<td>Every one to two years</td>
<td>Every year</td>
<td>Every one to two years</td>
<td>Every one to two years until age 50, then yearly</td>
</tr>
</tbody>
</table>

<sup>1</sup>From “National Cancer Institute FactSheet: Screening Mammograms,” 2006.
<sup>4</sup>“Breast Cancer Screening,” American College Obstetricians Gynecologists, 2003 April, p. 12.

The National Cancer Institute and the American Cancer Society recommend that women begin undergoing mammograms at age 40 (Cancer Facts & Figures, 2006). The ACS recommends annual mammograms, whereas, the NCI recommends a mammogram every one to two years. The American Cancer Society’s 2008 nationwide objectives for the early detection of breast cancer is to increase the proportion of women 40 years of age and older that are adhering to the ACS guidelines from 70% to greater than 90% (Cancer Prevention & Early Detection Facts & Figures, 2004). Other medical organizations have made similar recommendations.
Mammography Screening Improves Survival

Breast cancer screening has been shown to save lives (Berry et al., 2005, Berry et al., 2006). In the 1940s, few women were diagnosed with localized breast cancer and they had a five year survival of 72% (Cancer Facts & Figures, 2004). Currently, 63% of women with breast cancer are diagnosed with localized disease and their five-year survival rate is 97% (Cancer Facts & Figures).

Recent evidence suggests that younger women, between 40 and 49 years of age, benefit from screening mammography. “Meta-analyses of randomized, controlled trials demonstrate a 7% to 23% reduction in breast cancer mortality rates with screening mammography in women 40 to 49 years of age” (Armstrong, Moye, Williams, Berlin, & Reynolds, 2007, p. 516). The NCI reported that there is strong evidence that screening lowers breast cancer risk by 30% for women between the ages of 50 and 69 (National Cancer Institute: Cancer Trends Progress Report – 2005 Update). Additionally, Galit, Green, and Lital (2007) found that women over the age of 74 benefited from mammography by being diagnosed with significantly smaller tumors and earlier disease stage. Thus, women with a personal goal of extending life by detecting breast cancer early should begin undergoing an annual screening mammogram at age 40 (Cancer Facts & Figures, 2004).

Racial Disparities in Developing and Dying from Breast Cancer

Rates of developing and dying from breast cancer differ dramatically among racial groups in America. African-Americans, Hispanic-Americans, American Indians and Alaska Natives are more likely to be diagnosed with a more advanced stage of breast cancer and have a worse prognosis than European-American women (Breast Cancer: A
Resource Guide for Minority Women, May 2005). Of these minority groups, African-American women have the highest breast cancer death rate (Breast Cancer Facts & Figures, 2007-2008). In the 35-44 age category, an African-American woman faces twice the risk of death from breast cancer as her European-American counterpart. In addition, in 2003 African-American women were 18% more likely to die of all cancers combined than were European-American women (Cancer Facts & Figures for African Americans, 2007-2008).

Reasons for the African-American racial disparities in breast cancer frequency and severity of onset and mortality include African-Americans receiving less frequent mammograms, a delay from the time of abnormal mammography finding to diagnostic confirmation and treatment, more limited access to health care, more aggressive tumor characteristics (Smigal et al., 2006), and a higher prevalence of coexisting conditions (Cancer Facts & Figures for African Americans, 2003-2004). Additional differences have been attributed to African-American women’s attitudes and health beliefs (Hoffman-Goetz, 1999).

Racial Disparities in Rate of Mammography Screening

“Screening mammography is known to reduce mortality from breast cancer in the general U.S. population with disparities in screening mammography heavily contributing to race/ethnic disparities in breast cancer survival” (Curtis, Quale, Haggstrom, Smith-Bindman, 2007, p. 176). The rate of mammography screening varies with race and ethnicity. African-American, Hispanic-American, Asian-American, and Native American women were less likely than European-American women to have received adequate mammographic screening (Smith-Bindman et al., 2006). “Compared with 72% of
European-American women, only 63% to 68% of African-American, Hispanic-American, Asian-American, and Native American were frequently screened” (Smith-Bindman et al., p. 548) for breast cancer. Additionally, African-American, Hispanic-American, and Asian-American women were more likely to have never had a mammogram. Finally, when the investigators examined women who had been diagnosed with breast cancer, 24% to 34% of the African-American, Hispanic-American, and Native American were inadequately screened before their diagnosis, compared with 18% of European-American and 19% Asian-American (Smith-Bindman et al.).

There are many reasons why African-American women may not undergo an annual mammogram. One reason is that there may be a difference in the information they receive from the mass media generally and mass circulation magazines specifically. In other words, they may receive information that influences them to not seek a mammogram. This information could be related to African-American women’s religious beliefs, health beliefs, and attitudes toward European-American institutions (Hoffman-Goetz, 1999) and it could be related to their being talked down to in terms of their being less educated than European-American women. All of which might make it less likely that they will receive a mammogram (Breast Cancer Facts & Figures, 2005-2006).

Significance

There is a racial disparity in the rate of mammography screening and, as a result, in the early detection of, and death from, breast cancer. One possible reason for the racial disparity in mammography screening rates may be that African-American women receive different messages than European-American women from mass circulation magazines about mammography. I hypothesize that African-American women receive different
messages regarding mammography from mass circulation women’s magazines than European-American women. An implication of this research is that, if the messages are different, and the differences can be identified, then the messages can be changed and African-American lives can be saved.
First Lady Betty Ford’s diagnosis of breast cancer in 1974 marked the beginning of the U.S. media’s focus on the disease (Gerlach, Marino, & Hoffman-Goetz, 1997). Today, breast cancer and mammography are popular topics for mass circulation newspapers and magazines (Schwartz, Woloshin, Fowler, & Welch, 2004). According to Johnson (1997), magazines are a source of cancer information because they “provide a critical base of information that [women] may use to evaluate subsequently acquired information…when they are confronted with a medical problem” (p. 9). Thus, print media, principally newspapers and magazines, are a powerful tool in disseminating health information.

Meissner, Potosky, & Convissor (1992) found that individuals who receive most of their health information from print media are more likely to be aware of cancer screening procedures and protocols as compared to those who rely primarily on their physicians. According to Rutten, Moser, Beckjord, Hesse, and Croyle (2007), 15.5% of the respondents to their national telephone survey on cancer communication, reported print material as the primary source used during their most recent search for cancer information. These findings suggest that print media may affect the rate of mammography screening by impacting a woman’s decision to undergo a mammogram.

Readability

“Readability is what makes some text easier to read than others” (DuBay, 2004, p. 3). Since the 1920s, educators have used vocabulary difficulty and sentence length to determine reading difficulty (DuBay). According to DuBay, “formulas provide an
objective prediction of text difficulty” (p. 3). Today, these formulas are widely used in journalism and health care.

Magazine Demographics

Magazines began targeting the African-American audience in 1948 (Husni, 2007). Eighty-six percent of African-Americans read magazines, which is comparable to the eighty-five percent of U.S. adults that read magazines (Mediamark Research & Intelligence, Fall 2007). Eighty percent of both African-American and total magazine audiences have a high school education or higher. In addition, they share other characteristics including, one in five are widowed, divorced, or separated; they have less than two children under the age of 18 residing at home; and two-thirds are employed. In terms of categories of magazines, women’s magazines rank third in preference for the African-American reader versus second for the total U.S. magazine audience. Finally, the magazine experience for African-Americans is defined in terms of building relationships, emotional relevance, and visual appeal. These experiences are more important to African-American readers than to all magazine readers.

Amount of Cancer Coverage in Women’s Magazines

Cancer articles often focused on breast cancer. Marino and Gerlach (1999) conducted a content analysis on seven women’s magazines published from 1987 to 1995 for accuracy and balance on cancer coverage. They found that breast cancer was the topic of 34.9% of the 585 articles published on cancer. It was also found that magazines targeting African-American women contained less coverage of breast cancer.

Related to Marino and Gerlach (1999), Gerlach, Marino, and Hoffman-Goetz (1997) asked which cancer received the most coverage in women’s magazines from 1987
to 1995 and what type of information is being disseminated about that cancer. The authors found that breast cancer received more coverage than any other cancer and that women’s magazines neglected lung and colon cancer. These studies showed that when cancer was covered, breast cancer was frequently the topic.

*Media Coverage of Mammography Screening*

Studies show that media coverage of mammography can increase screening. For example, Yanovitzky and Blitz (2000) studied the significance of newspaper coverage and physician advice on a woman’s decision to undergo a mammogram. They conducted monthly telephone interviews and a newspaper content analysis of seven newspapers published January 1989 to December 1991 regarding mammography. The investigators found that 93% of the articles encouraged annual mammography for women 40 years of age and older. They also found that both the media and women’s physicians affected mammogram utilization. Women who had access to a physician were more likely to be persuaded by physician advice, whereas newspaper coverage was more important for those women who did not have access to a physician.

In addition, Wells, Marshall, Crawley, and Dickersin (2001) found that newspaper coverage promoted mammography. The investigators conducted a cross-sectional descriptive study of articles containing a reference to mammography from six of the top U.S. circulating newspapers from 1990 to 1997. Their results demonstrated that newspapers could be reliable sources of medical and scientific information; however, mammography recommendations had not been updated to reflect changing national mammography guidelines.
Magazines also cover mammography. Dobias, Moyer, McAchran, Katz, and Sonnad (2001) examined the quantity and quality of information on mammography in relation to the educational level of the target audience. Data was collected from 37 magazines published from January 1988 through April 1994. The magazines were stratified into three levels by percentage of female college graduates. A content analysis was used to assess the relationship between the media’s message about mammography and reader’s educational level. They found that 78% of articles categorized in the low education level presented an unbalanced view of mammography screening whereas this only occurred in 28% of the highest education level. In other words, “the articles targeted toward women with low education downplayed the uncertainty surrounding mammography, while campaigning strongly for the lifesaving power of the technology” (p. 137). The women in the highest educated level received a more balanced and informative message.

In summary, media coverage of mammography promoted breast cancer screening, especially for women who do not have access to a physician. Newspapers and magazines promoted mammography, without presenting the benefits and risks of the diagnostic procedure.

*African-American Women’s Attitudes and Beliefs about Cancer*

African-American women may not receive the same information regarding breast cancer as European-American women and this may impact their decision to undergo a mammogram. In the previously mentioned Hoffman-Goetz (1999) study of cancer stories in magazines, she found that the stories presented in the African-American magazines exhibited five themes, namely, religiosity, cancer fatalism, quality of life after diagnosis,
interactions with medical personnel, and treatment choices. For religiosity she found that
the women’s magazines emphasized God, faith, and prayer as instrumental in coping with
a diagnosis and treatment of cancer. However, her study was not limited to breast cancer
and it did not compare the African-American themes to themes in European-American
magazines.

Another study found that African-American readers were not passively reading
text; rather, they were constructing and assigning meaning to these texts according to
their socioeconomic, cultural, and ideological perspectives (Beaulieu & Lippman, 1995).
Thus, the breast cancer messages published in magazines aimed at the African-American
audience are associated with their attitudes and beliefs toward cancer, prevention, and
treatment.

*Summary of Literature Review*

Women’s magazines are an important source of information regarding breast
cancer. Studies show that women who receive their health information from print media
are more likely to be aware of cancer screening and protocols. When cancer is covered,
breast cancer is the most frequently covered cancer. Media messages promote
mammography without reporting the risks of mammography. Finally, African-American
women may receive specific cancer information related to their attitudes and beliefs.

*Study Hypothesis*

The purpose of this study is to investigate differences in the media’s message
about mammography that African-American and European-American target audiences
receive from mass circulation magazines. I hypothesize that African-American women
receive different messages regarding mammography from mass circulation women’s magazines than European-American women.
Method

I employed content analysis, “a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use” (Krippendorf, 2004, p. 18). Two research purposes of content analysis are: “To describe the communication and to draw inferences about its meaning or infer from the communication its context of production or consumption” (Riffe, Lacy, Fico, 1998, p. 26).

The content analysis will be computer-aided because this method of data acquisition is easily replicated and optimizes coder reliability (Weber, 1985). Thus, it is an appropriate method for acquiring words in magazine articles related to mammography.

Magazines and Articles

The criteria I used to select the magazines were: (1) published monthly, (2) a circulation greater than one million (Magazine Publishers of America, 2005), (3) contained full-text articles in the ProQuest database, (4) female readership greater than 50 percent, (5) African-American or European-American readership greater than 50 percent, (6) racial concordance between publisher/editor and readers, (7) contained at least 1,000 words across all relevant articles or sections of articles per magazine, and (8) published between January 1, 2002 and December 31, 2007.

To find the magazines that met these criteria, I obtained the most recent list of the top 100 circulated magazines in the United States from the Magazine Publishers of America (MPA). The MPA reported 89 magazines that had a circulation of at least one million. Beginning with the magazine with the highest circulation, I checked the ProQuest on-line database to determine whether it included full-text articles of that
magazine between January 1, 2002 and December 31, 2007. I continued this search in descending order. I eliminated any magazine that was not included in ProQuest.

Beginning with the magazine with the highest circulation, I searched Echo Media for female readership demographics; Echo Media (“For over 10 years,” 2008) is a direct response advertising firm and provides readership demographic profiles on magazines. For magazines not included in the Echo Media list, I searched the Project for Excellence in Journalism (“Project for Excellence,” 2008) for female readership demographics. This site also provided the percentage of male and female readers of magazines. I eliminated all the magazines that did not report at least 50 percent female readership.

I then determined the percentage of African-American and European-American readers from information obtained from the Magazine Publishers of America (“The definitive resource,” 2008). This website listed the percent of readers by race for specific magazines in 2004. For magazines that were not included in this list, I searched the individual magazine’s website to learn the percentage of European-American readers. I eliminated any magazine that did not have a minimum of 50 percent African-American or European-American readership. All magazines from the Magazine Publishers of America top 100 circulated list that met the inclusion criteria were accepted for analysis.

I then searched the potentially relevant magazines using the ProQuest database using the search descriptor “mammo.” I found 124 full-text on-line articles in ProQuest published between January 1, 2002 and December 31, 2007. I read all the magazine articles and determined which articles or sections of articles were devoted to mammography.
Categories of Words

After reading the selected articles I grouped the words sharing similar meanings into seven categories: (1) religiosity, by which I mean spirituality; (2) activity, by which I mean a call to action; (3) positive and (4) negative emotions, by which I mean feelings; (5) medical terms, by which I mean both scientific or common; (6) risk factors, by which I mean factors that affect one’s risk of being diagnosed with breast cancer; and (7) race portrayed, by which I mean when race was noted in an article as African-American/Black or European-American/White. I applied these categories to develop a coding instrument (See Appendix).

Word Frequencies

After enumerating each magazine for identification purposes, I electronically searched each magazine using the Window’s “CTRL F” command for the targeted words in the code book. I tallied the frequency with which each word occurred in the magazine and wrote that number on the code sheet.

Readability

Microsoft Word has a built-in program to determine reading ease, grade level, and number of passive sentences (“Test your document’s readability,” 2008). Readability was based on the Flesch Reading Ease test. This test rates text on a 100-point scale based on the formula 206.835 – (1.015 x ASL) – (84.6 x ASW), where ASL was the average sentence length (the number of words divided by the number of sentences) and ASW was the average number of syllables per word (the number of syllables divided by the number of words).
The same program assessed the text according to U.S. reading grade level. The formula for the Flesch-Kincaid Grade Level test was \((.39 \times \text{ASL}) + (11.8 \times \text{ASW}) - 15.59\) (“Test your document’s readability,” 2008). The result was a score that identified the minimum grade level for the reader to understand the text. For example, a score of 10.0 meant that an individual who can read at the tenth grade reading level should understand the article. The program also scores passive sentences.

Statistics

I used the Pearson product-moment method to calculate correlations. The African-American magazines contained 61% of the words in the European-American magazines; therefore, I calculated relative frequencies by multiplying the European-American absolute frequency by 0.61. I used the Student’s t-test for correlated samples to compare the means of the continuous variables. I used McNemar’s test to assess the difference between two correlated proportions. Significance was set at the 0.05 level, one-tailed (“VassarStats,” 2008).
Results

The magazines that met the study criteria were the African-American magazines *Ebony* and *Essence* and the European-American magazines *Good Housekeeping*, *Marie Claire*, *Redbook*, and *Vogue*.

First, I report the number of selected words per magazine. Second, I report the grade level, number of passive sentences, and the reading ease of the different magazines. Third, I report the correlation between the two types of magazines across all words and the mean word frequencies per category. Fourth, I report the means and the differences in the means for the categories of words.

The six magazines yielded the following total number of words per magazine that focused on mammography: (a) *Ebony*: 17,221 words, (b) *Essence*: 20,257 words, (c) *Good Housekeeping*: 12,998 words, (d) *Marie Claire*: 7,654 words, (e) *Redbook*: 29,201 words, and (f) *Vogue*: 11,482 words.

The grade level was lower for the European-American magazines (mean 8.1) than the African-American magazines (mean 10.1), p = 0.02. There were fewer passive sentences in the European-American magazines (mean 2.3) than in the African-American magazines (mean 7.5), p = 0.001. The reading ease was easier for the European-American magazines (mean 57.3) than in the African-American magazines (mean 53.5), p = 0.13. According to Flesch (1949), a score between 50 and 60 is fairly difficult.

Across all the words, the two African-American magazines were highly correlated, r = 0.85. The mean correlation of the four European-American magazines, r = 0.67. The African-American magazines were combined as were the European-American
magazines and, across all words, the correlation between the African-American and European-American magazines was 0.73 (p < 0.001).

The relative word frequencies across all words were significantly different. The African-American mean word frequency was 1.6 times the European-American mean word frequency, African-American was 35.02 and European-American was 22.26 (p = 0.0015).

The word categories were compared in terms of their relative word frequencies (See Table 2).

Table 2. Comparison of African-American and European-American Word Frequencies, Overall and by Word Category

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean AA word frequency</th>
<th>Mean EA word frequency</th>
<th>Ratio (AA/EA)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>35.02</td>
<td>22.26</td>
<td>1.6</td>
<td>0.0015</td>
</tr>
<tr>
<td>Religiosity</td>
<td>5.17</td>
<td>1.93</td>
<td>2.8</td>
<td>0.083</td>
</tr>
<tr>
<td>Activity</td>
<td>39.25</td>
<td>29.20</td>
<td>1.3</td>
<td>0.083</td>
</tr>
<tr>
<td>Positive emotions</td>
<td>36.75</td>
<td>21.25</td>
<td>1.7</td>
<td>0.049</td>
</tr>
<tr>
<td>Negative emotions</td>
<td>14.78</td>
<td>8.93</td>
<td>1.7</td>
<td>0.069</td>
</tr>
<tr>
<td>Medical terms</td>
<td>37.00</td>
<td>32.29</td>
<td>1.1</td>
<td>0.212</td>
</tr>
<tr>
<td>Risk factors</td>
<td>55.43</td>
<td>38.00</td>
<td>1.5</td>
<td>0.090</td>
</tr>
<tr>
<td>Race</td>
<td>6.0 (CI 1.77, 20.37)</td>
<td></td>
<td>Odds ratio =</td>
<td>0.00075</td>
</tr>
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21
For religiosity, the African-American relative mean word frequency was 2.8 times the European-American relative mean word frequency, African-American was 5.17 and European-American was 1.93 (p = 0.083). For activity, the African-American relative mean word frequency was 1.3 times the European-American relative mean word frequency, African-American was 39.25 and European-American was 29.2 (p = 0.083). For positive emotions, the African-American relative mean word frequency was 1.7 times the European-American relative mean word frequency, African-American was 36.75 and the European-American was 21.25 (p = 0.049). For negative emotions, the African-American relative mean word frequency was 1.7 times the European-American relative mean word frequency, African-American was 14.78 and European-American was 8.93 (p = 0.069). For medical, the African-American relative mean word frequency was 1.1 times the European-American relative mean word frequency, African-American was 37 and European-American was 32.29 (p = 0.212). For risk, the African-American relative mean word frequency was 1.5 times the European-American relative mean word frequency, African-American was 55.43 and European-American was 38 (p = 0.090). For race, the African-American mean word frequency was 24 times the European-American mean word frequency and the odds ratio was 6 (CI 1.77, 20.37), p = 0.00075.

The results show that there are differences in the mammography messages presented in the African-American and the European-American magazines. The results are discussed and the limitations are presented in the Conclusion.
Conclusion

In terms of mammography-related articles, I found that the African-American magazines had a higher grade level, more difficult readability, and more passive sentences. Thus, for mammography, African-American magazines were more literate than their European-American counterparts. The literature regarding readability and race have generally found that European-American magazines have a higher grade level, more difficult readability, and more passive sentences (Dobias, Moyer, McAchran, Katz, & Sonnad, 2001). My study suggests that readability may be content-specific rather than race-specific. In other words, the mammography-related content of the African-American magazines was not the result of a “dumbing down” of their message.

In terms of the categories, the African-American magazines contained more references to religiosity, activity, positive and negative emotions, and risk than their European-American counterparts. The African-American and European-American magazines did not differ in their medical information. Finally, it was striking that racial references to African-Americans were ubiquitous in the African-American magazines, whereas, racial references to either African-Americans or European-Americans were almost completely absent from the European-American magazines. To the best of my knowledge, this is the first study to compare the mammography-related messages presented in African-American and European-American magazines.

A previous study demonstrated that religiosity was a theme in African-American magazine stories related to cancer (Hoffman-Goetz, 1999). I have extended this finding to articles related to mammography. I found that African-American magazines displayed more religiosity than European-American magazines. In terms of mammography, there is
no literature on racial differences in activity and emotionality nor is there any literature regarding racial differences in medical or risk information. Finally, there is no literature regarding racial differences in racial references. Thus, my findings in these areas are novel.

The relationship between the editorial content of a magazine and the psychosocial reality of its readers is complex (Guidry, Matthews-Juarez, & Copeland, 2003). Although magazine editors want to inform and persuade; they, like all successful communications media, must understand and reflect their readers (Abrahamson, 2001; “Credibility bridges gap with the public,” 1997). Readers are active participants in the reading process (Krippendorf, 2004; Beaulieu & Lippman, 1995). Further, they bring their sociological and psychological perspectives to what they read (Zimbardo & Leippe, 1991). Finally, African-American women assign meaning to what they read according to their socioeconomic, cultural, and ideological perspectives (Beaulieu & Lippman, 1995).

African-American magazines provide very similar messages to their African-American readers; much more similar than those provided by European-American magazines to their readers. In other words, the African-American editorial content was very similar, suggesting that their readers shared the same psychosocial perspective. Further, African-American magazines were suffused with race. It was as if African-American women feel that they are different, perhaps even special, compared to European-American women. The African-American magazines said that the information about mammography was for “you,” the reader because you are an African-American woman. For example, in *Ebony* “…a battle against one of the most serious conditions Black women have to face” (Kinnon, 2006, p. 151) and in *Essence* “The loss of hair is
one of the most devastating experiences for cancer patients, especially Black women” (Burt-Murray, 2007, p. 20).

Both African-American and European-American magazines contained similar references to medical information, suggesting that the objective content of the magazines was the same for both African-Americans and European-Americans. African-American magazines expressed more activity and emotions than European-American magazines which suggest that mammography had a greater active and emotional component to African-Americans than to European-Americans.

It can be proposed that African-American women view mammography, and perhaps many other health issues, from a weltanschauung of deep emotions, strong religious beliefs, and an abiding faith in their special status in the world --- that their survival from cancer rests in God’s hands (Hoffman-Goetz, 1999). One can speculate that this perspective may result into a feeling that, because of their special status in the world, God will take care of African-American women through His power to heal (Wardlow & Curry, 1996), so they do not need to screen for breast cancer.

My study had several limitations. One limitation was that the magazines were mass circulation monthlies and future research may examine how mammography is covered in other types of magazines. Word frequency was both a strength and a limitation. It was a strength because its variables were relatively objective. Although we can draw inferences about meaning from the communication (Riffe, Lacy, Fico, 1998), we cannot completely account for the connotation of the sentences. Finally, although there were large differences in the magnitude of the racial differences in all the categories except medical information; some of the differences approached did not reach...
significance. A larger study might have allowed a larger number of category differences to have achieved significance.
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References


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Vita

Gina A. Petrak, a native of San Antonio, Texas, was the first woman to receive a full athletic tennis scholarship from Northeast Louisiana University (NLU). She was awarded a Bachelor of Arts degree in Education (Cum Laude) from Saint Mary’s University of San Antonio, Texas. Ms. Petrak has worked in sales and marketing for Texas Instruments (TI), Southwestern Bell (SBC), and Procter and Gamble (P&G). She has also taught Health and English in secondary education.

Since 1998, Ms. Petrak has advocated for cancer patients at the local and national levels. After successfully completing Project LEAD, the National Breast Cancer Coalition’s (NBCC) advocacy course, Ms. Petrak served on an Institutional Review Board (IRB) at The Wayne State University (WSU) from 2000-2005. Currently, Ms. Petrak serves as a founding member of the National Cancer Institute’s Consumer Advocates in Research and Related Activities (CARRA) program.

At The Johns Hopkins University’s Communication in Contemporary Society Advanced Academic Program she focused on health communication with an emphasis on social corporate responsibility and integrated marketing communications. She studied Communication in China at the JHU campus in Nanjing, China. Ms. Petrak’s current research interests include breast cancer, mammography, advocacy, and persuasion.