

Topics and Sources of Memorable Breast Cancer Messages and Their Impact on Prevention and Detection Behaviors

**SANDI W. SMITH, SAMANTHA NAZIONE, AND
CAROLYN LAPLANTE**

Michigan State University, East Lansing, Michigan, USA

MICHAEL R. KOTOWSKI

University of Tennessee, Knoxville, Tennessee, USA

CHARLES ATKIN

Michigan State University, East Lansing, Michigan, USA

CHRISTINE M. SKUBISZ

University of Maryland, College Park, Maryland, USA

CYNTHIA STOHL

University of California, Santa Barbara, Santa Barbara, California, USA

Often, people are able to recall a message on a particular topic for a long period of time. These memorable messages have the ability to influence behavior when they are recalled from memory long after initial exposure. Knowing the topics and sources of the messages that are remembered about breast cancer can improve the efficacy of future breast cancer outreach. To this end, 359 women completed an online survey about memorable breast cancer messages. Most women (60%) recalled a memorable message, described it, identified its source, and noted whether it had resulted in prevention or detection behaviors. Four categories of message topics emerged: early detection (37.3%), awareness (30.9%), treatment (25.8%), and prevention (6%). Furthermore, five categories of sources of these memorable messages were found: media (35.5%), friends (22.2%), family (21.6%), medical professionals (15.2%), and others (5.5%). The media were a major source of all four topics of messages, although family members, friends, and the medical community were major sources for particular message topics as well. Memorable messages originating from medical professionals were substantially more likely to motivate detection behaviors than prevention behaviors. This research demonstrates that

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Address correspondence to Sandi W. Smith, Director, Health and Risk Communication Center, Michigan State University, 473 Communication Arts & Sciences Building, East Lansing, MI 48824-1212, USA. E-mail: smiths@msu.edu

message topic and source both play roles in determining message recall as well as in determining how memorable messages impacted behavior.

Breast cancer prevention, diagnosis, and treatment compose some of the most compelling and ubiquitous health issues facing society. Within the United States, most women have exposure to the disease either directly or indirectly (Susan G. Komen for the Cure, 2007). Not surprisingly, messages about breast cancer also are prevalent in society. Messages that motivate women toward behaviors that enhance prevention and (or) increase the likelihood of detection are valuable because they can decrease the occurrence of the disease and save lives.

Protective behaviors of prevention and early detection play an important role in decreasing the incidence of, and mortality from, breast cancer (American Cancer Society, Inc., 2005). Studies demonstrate that exposure to breast cancer messages can influence the degree to which women perform protective breast cancer behaviors (Dalessandri, Cooper, & Rucker, 1998; Earp et al., 2002; Jones, Denham, & Springston, 2006; Powell et al., 2005). A message must be recalled, however, in order to influence women's health behaviors after initial exposure (Rimer & Glassman, 1984). Consequently, it is important to determine the characteristics of those breast cancer messages that become memorable.

Although research has examined the different media sources of cancer messages, such as newspaper articles (Moriarty & Stryker, 2007), popular magazines (Dobias, Moyer, McAchran, Katz, & Sonnad, 2001), pamphlets (Kline & Mattson, 2000), as well as interpersonal interaction (Jones et al., 2006), researchers have not examined breast cancer communication within the conceptual framework of memorable messages. Knapp, Stohl, and Reardon (1981) originally defined memorable messages as "verbal messages which may be remembered for extremely long periods of time and which people perceived as a major influence on the course of their lives" (p. 27). Because these messages potentially have a long-term impact on the behaviors of receivers, it is important to determine the topics of memorable breast cancer messages and their sources so that future breast cancer messages can be designed and communicated effectively. This study examines the topics of breast cancer memorable messages and their sources and the relationship between those characteristics and women's performance of prevention and detection behaviors.

Memorable Messages

Memorable messages are pervasive. Smith and Ellis (2001) conducted an investigation of memorable messages as guides to behavior, focusing on messages recalled when self-assessing personal behavior that exceeded or fell below personal standards. Almost all of the participants (99%) were able to report messages that they recalled when self-assessing behavior. The behavioral impact of memorable messages also has been studied in final conversations about religious faith (Keeley, 2004), aging (Holladay, 2002), gendered socialization (Dallimore, 2003), and newcomer socialization in organizations (Stohl, 1986).

People receive hundreds, if not thousands, of messages each day, and most of these messages are processed and then released from the short-term memory's cache. Some of these messages, however, are perceived as important units of

communication that potentially have a strong effect on behavior and sense-making processes (Holladay, 2002). These messages are consequently stored in long-term memory thus becoming memorable. Knapp and colleagues (1981) suggest that the reasons people remember these messages involve several characteristics of the message. Messages perceived as memorable are most often brief and prescribe rules of conduct for solving problems that could occur or have occurred.

Breast Cancer

Excluding skin cancer, breast cancer is currently the most commonly diagnosed cancer in women. Statistics suggest that one out of every nine women will develop the disease between the ages of 20 and 80. Approximately 2.3 million women were alive at the beginning of 2002 who had direct experience with breast cancer (American Cancer Society, Inc., 2005). An estimated 178,480 American women developed breast cancer and 40,460 women died from the disease in 2007 (American Cancer Society, Inc., 2007a). Breast cancer is second only to lung cancer in cancer deaths among women. Nevertheless, due to better treatment and earlier detection the death rate from breast cancer has decreased since 1990 (American Cancer Society, Inc., 2005).

There are four main phases of knowledge and experience with breast cancer. The first is *awareness* of the disease, followed by active *prevention* attempts. Next is an effort to *detect* the disease, which can involve a diagnosis. Finally, if needed, *treatment* of the disease follows. Although not all women will experience every phase, most women likely will be aware of breast cancer due to national campaigns and its prominence in television news broadcasts (Pribble et al., 2006). Additionally, these phases do not necessarily occur in sequence. For example, a woman may be aware of breast cancer and make efforts to detect it, but she may never try to prevent it. Furthermore, research has identified the different topics of cancer messages women are exposed to: awareness (Papas, Logan, & Tomar, 2004), prevention, detection (Dillard & Nabi, 2006), and treatment (Liang et al., 2002), and these topics mirror the phases of breast cancer experience. It is unknown, however, what topics of messages become memorable. Therefore, this study is interested in answering the following research question:

RQ1: What topics of breast cancer messages are reported as memorable?

Sources of Memorable Messages

Message source is an important aspect of any message because it affects persuasiveness (Heesacker, Petty, & Cacioppo, 1983). For example, remembered messages typically originate from sources that are higher in status and familiar to the receiver (Dallimore, 2003; Holladay, 2002; Stohl, 1986). Consequently, memorable breast cancer message source credibility differs from person to person based on the recipient's age, education, socioeconomic status (Jones et al., 2006; Rees & Bath, 2000), active or passive health attitudes (Carlsson, 2000), culture (Rajaram & Rashidi, 1999), and health status (Pecchioni & Sparks, 2007). Some research has taken this knowledge and applied it, examining the effectiveness of specific sources for breast cancer messages. For example, although messages about

breast cancer awareness, prevention, detection, and treatment are offered frequently through the media, doctors often are claimed to be the best sources of breast cancer messages (Atkin, Smith, Ferguson, & McFeters, 2008). Additionally, a study of cancer patients found that the most common source of information was a doctor, followed by family, nurses, friends, the Internet, other medical personnel, and other patients (Pecchioni & Sparks, 2007). Another study conducted to investigate the sources of breast cancer messages that women valued found that doctors were favored, followed by media, family, and friends (Meissner, Potosky, & Convisser, 1992). Family members of cancer patients on the other hand reported being most satisfied with information obtained from the Internet (Pecchioni & Sparks, 2007).

Studies also have found that women are likely to seek screening for breast cancer if they are instructed to obtain a screening by a doctor (Clark et al., 2000; O'Malley et al., 2001). When a doctor fails to recommend that their patients receive screening for breast cancer or work toward preventing an illness, however, patients turn toward media sources such as celebrities and journalists. For example, Meissner and colleagues (1992) found that breast cancer patients preferred to get their information from their health care providers at the time of their diagnosis but often were unsatisfied with the information they received. When dissatisfaction occurs, patients turn to media sources that were more readily available to meet their needs (Rees & Bath, 2000). A study of the general population found health care professionals were the most frequently used source of health information followed by the media (O'Malley, Kerner, & Johnson, 1999). Atkin and colleagues (2008) found that women who used media sources to retrieve information about breast cancer were significantly more likely to have heard of cancer screenings than those women who received most of their information from their doctor.

Patient information-seeking tendencies in the face of aversive health information as a method of coping also has been examined to understand the preferred sources for breast cancer messages. Active patients, or monitors (Miller, 1980, 1987), are proactive in their search for breast cancer information, whereas passive patients, or blunters (Miller, 1980, 1987), allow the information to come to them. One study asked cancer patients where they turned for medical advice and found that monitors sought information from medical books, narratives, the Internet, and telephone hotlines (Pecchioni & Sparks, 2007). Blunters, on the other hand, the more common of the two groups, received information about their cancer from the television, radio, newspapers, other patients, and friends. Mothers' and daughters' preferred sources for breast cancer messages also have been studied. Jones and colleagues (2006) found that while mothers tended to turn most often to media sources, daughters tended to turn most often to interpersonal resources like family and friends.

Taken together, these studies suggest that breast cancer messages are transmitted by three categories of sources: medical professionals, media sources, and interaction with people personally known by the receiver. Therefore, we offer the following research question:

- RQ2: Will the main source categories of memorable breast cancer messages be medical professionals, media sources, and interpersonal relations, including both family and friends?

Behavioral Outcomes

Although it is likely that women receive exposure to several different topics of breast cancer messages from several different sources, it is unknown whether message topic or source is associated with particular behavioral outcomes. One meta-analysis found that mediated health communication campaigns are successful in changing the behavior of about 8% of the target population (Snyder et al., 2004). Mullen, Mains, and Valez (1992) reviewed studies of cardiac interventions in clinics and found that exposure to the intervention had a measurable effect on several different behaviors, but that the effect was variable depending on the type of behavior targeted. Furthermore, various studies have shown that mediated messages are effective at modifying abstinence, smoking, seatbelt use, and condom use (Egger et al., 1983; Kim, Kols, Nyakauru, Marangwanda, & Chibatamoto, 2001; Shapiro, Meekers, & Tamashe, 2003; Wells, Malenfant, Williams, & Van Houten, 2000).

Findings on the effectiveness of communication campaigns to bring about behavioral outcomes in breast cancer prevention or detection related behaviors are mixed. Although conclusive evidence declaring that certain sources or topics are more likely to change behaviors is elusive, the results of these studies provide a glimpse into this relationship. For example, medical professionals have been found to be the most frequent, valued, and consistent source of health information (Meissner et al., 1992; O'Malley et al., 1999; Pecchioni & Sparks, 2007). The literature is also beginning to show that messages from medical professionals can increase women's prevention and detection behaviors. One study found that a phone call from a nurse increased mammography use fivefold when compared with a control group who received only a pamphlet (Dalessandri et al., 1998). Additionally, Strickland, and colleagues (1997) reported on an intervention that tested the effects of receiving one, two, or all of the following messages: physician messages, a class on breast self-examination, and message reinforcement through a postcard and a phone call. Women who received all three messages reported engaging in the most breast self-examinations. There were reported increases of breast self-examination across all levels of the intervention, however.

Like messages originating from medical professionals, research indicates that some messages from media sources are more effective at increasing breast cancer prevention and detection behaviors than others. One study reviewed 15 media campaigns to promote physical activity, which aids breast cancer prevention, and found that although the majority were recalled, there was little or no influence on behaviors (Cavill & Bauman, 2004). Another study of a statewide media campaign revealed that the messages might have had adverse effects on women's breast cancer detection behaviors (McCaul, Jacobson, & Martinson, 1998). Other studies, however, have recorded significant increases in the desired behavioral outcomes. Media in China used two public service announcements to increase detection behaviors and found that they were effective in improving knowledge of breast health, knowledge of breast self-exams, and improving breast health practices (Sun, Zhang, Tsoh, Wong-Kim, & Chow, 2007). Additionally, a study of culturally tailored messages in magazines increased *both* breast cancer prevention (eating fruits and vegetables) and detection (mammography) behaviors in women (Kreuter et al., 2005).

Finally, interpersonal sources are known to affect breast cancer prevention and detection behaviors as well. One study found that dialogue with friends and relatives increased the chances that African American women would seek screening for breast

cancer (Husaini et al., 2001). Another study using a telephone intervention strategy in which women contacted friends and encouraged them to have a mammogram showed that these interpersonal contacts increased mammography usage when compared with a control group (Calle, Miracle-McMahill, Moss, & Heath, 1994). Similarly, Jones, Denham, and Springston (2006) found that discussion with relatives about breast cancer led to higher numbers of breast self-exams performed by college-aged women.

These studies demonstrate that although the effect is not consistent, messages can influence the performance of prevention and detection behaviors. Therefore, we pose the following research question:

RQ3: What is the relationship between different topics and sources of memorable messages and the enactment of breast cancer prevention and detection behaviors?

Method

Participants

Participants were recruited from breast cancer awareness organizations, advocacy groups, a large Midwestern university, and a medium-sized Western university in the United States. In sum, 359 female respondents completed the survey. Participants ranged from 18 to 85 years old. Caucasians composed the majority of the sample, 85%. African Americans (4%), Latinos (3%), Asian Americans (2%), Native Americans (2%), Pacific Islanders (3%), and those choosing not to respond (1%) composed the remainder of the sample. When participants were asked about their highest level of education, 11% reported a high school degree or less, 35% participants completed some college, technical school, or earned an associate's degree, 32% earned a bachelor's degree, and 22% had graduate schooling.

Instrumentation and Procedure

Participants completed a web-based survey questionnaire. The beginning of the survey gave the definition of a memorable message provided previously and asked participants if they could recall a memorable message about breast cancer. If the participant did have a memorable message (60%), a series of open-ended questions asked about personal experience with breast cancer and characteristics of, as well as responses to, their memorable message.

The topics of memorable messages were coded reliably (Cohen's kappa = .93) by two trained coders into 16 subcategories that formed four second-order categories also determined by the two coders. The first category, breast cancer *awareness*, included the subcategories of statistics/facts, breast cancer prevalence, and campaigns/organizations. The second category of *prevention* included the subcategories of health/be proactive, improve/change a health behavior, and family risk. Third, the category of *detection* included the subcategories of breast self-exam, mammograms, breast self-exam *and* mammograms, and early detection. The fourth category was *treatment*, which included the subcategories of appearance, choices, survival choices, social support, womanhood, fear/pain/negative, and appreciation for everyday life.

Message sources were coded into four main categories (family, friend, media, medical professional) from the 17 categories that participants identified (Cohen's kappa = 1.0). Mother, sister, grandmother, grandfather, father, husband, aunt, cousin, and child composed the *family* category. *Friend* was classified into its own category. The *media* source category included celebrities, journalists, and other sources found in the media. Doctors and nurses were classified as *medical professionals*. Finally, an "other" category was formed by collapsing together teacher, other authority figure, and other responses that did not fit into one of the four main categories.

Results

Topics of Memorable Messages

The largest proportion of memorable breast cancer messages was categorized as *detection* messages, 37%. Exemplars from this category were, "Do a self breast examination every month," "Don't put off having a mammogram," "Early detection saves lives," and "Don't forget to do self breast exams and get yearly mammograms." The second most frequently recalled memorable message was the breast cancer *awareness* category, 31%. Messages in this category focused mainly on statistics such as "Over 40,000 women a year die from breast cancer," or major breast cancer organizations such as The Pink Ribbon. Memorable messages with a *treatment* focus made up 26% of the messages. These messages focused on treatment outcomes such as, "I would rather have lost a breast than my life, I am lucky I caught it early enough to not have it take the rest of me . . . if it comes down to the choice, it's just cosmetics." An example of treatment choices was, "The second time she was diagnosed it was even more severe than the first, but she refused to just die and continued all the treatments available." Treatment messages also included experimental therapy such as, "She refused to simply lie down and let cancer conquer her," and fear of treatment, "Before going into surgery, my mother-in-law said, 'I was so frightened that all I could do was cry.' Afterwards she often commented that her scar was so tender that it hurt to have the sheet touch where the incision was." Finally, 6% of reported memorable messages fell under the category of *prevention*. Messages in the prevention category focused on the importance of being proactive about health. They included the following: "We must stop the silence that exists in the African American community because it's important that we know our family medical history in order to be proactive with our health," and the importance of healthy behavior such as, "What you eat, drink, put on your skin and breath[e] can cause cancer." Therefore, the answer to RQ1 is that the topics of memorable messages most often reported were *detection* and *awareness*, followed by *treatment* and *prevention* of breast cancer.

Sources of Memorable Messages

Examination of data for the most frequent sources of memorable breast cancer messages reveals that the media were the primary source of these messages. Of all the memorable messages recalled by the participants, 36% were from the media. Memorable messages originating from friends (23%) and family members (21%) were the

Table 1. Percentages of topics of memorable messages and their sources

Source	Memorable messages				
	BC Awareness	Prevention	Detection	Treatment	Total
Family	1.9 (6%)	2.8 (46%)	11.3 (30%)	5.2 (20%)	21.1
Media	16.9 (55%)	1.9 (31%)	9.4 (25%)	7.4 (29%)	35.7
Health Care	2.8 (9%)	0.9 (15%)	9.4 (25%)	1.9 (8%)	15
Friend	7 (23%)	0.5 (8%)	5.6 (15%)	9.4 (37%)	22.5
Other	2.3 (7%)	0.0 (0%)	1.9 (5%)	1.4 (6%)	5.6
Total	31%	6.1%	37.6	25.4	100

Note. $N = 213$, BC = Breast Cancer, Health Care = Health Care Professional. Percentages that come first are percentage of total and percentages in parentheses are percent of message topic category.

second and third most common, respectively. In a finding that might be surprising to some, health care professionals were the source of only 15% of the memorable messages. Six percent of the memorable breast cancer messages were from sources that did not fit into any of the other categories. Therefore, the answer to RQ2 is that media, interpersonal sources such as friends and family members, and medical professionals, respectively, were the main sources of breast cancer memorable messages.

Relationship Between Topic and Source

Of the breast cancer *awareness* messages, 55% were from the media, 23% were from a friend, 9% were from a health care professional, and 6% were from a family member (7% were from another source). Of those messages that were about *prevention*, 46% were from a family member, 31% were from the media, 15% were from a health care professional, and 8% were from a friend. Of the *detection* focused memorable messages, 30% were from a family member, 25% were from the media, 25% were from a health care professional, 15% were from a friend, and 5% were from another source. Of the messages that were about *treatment*, 37% were from a friend, 29% were from the media, 20% were from a family member, 8% were from a health care professional, and 6% were from another source. Table 1 presents the topics of memorable messages and their sources both as a percent of all messages and in terms of the percentages within topic of message.

Relationship Between Memorable Messages and Behaviors

In order to assess the relationship between memorable messages and behaviors, respondents indicated whether their memorable message motivated them to engage in breast cancer detection behaviors and (or) breast cancer prevention behaviors. Responses to the questions, “*Did you engage in breast self exams?*” and “*Did you engage in mammograms?*” had a Pearson correlation of .52 ($n = 214, p < .05$) and were summed to form a measure of detection behaviors that ranged from 0 to 2. Responses to the questions, “*Did you engage in eating healthy food?*” and “*Did you engage in exercise?*” had a Pearson correlation of .71 ($n = 210, p < .05$). Summing responses to these two questions formed a measure of prevention behaviors that ranged from

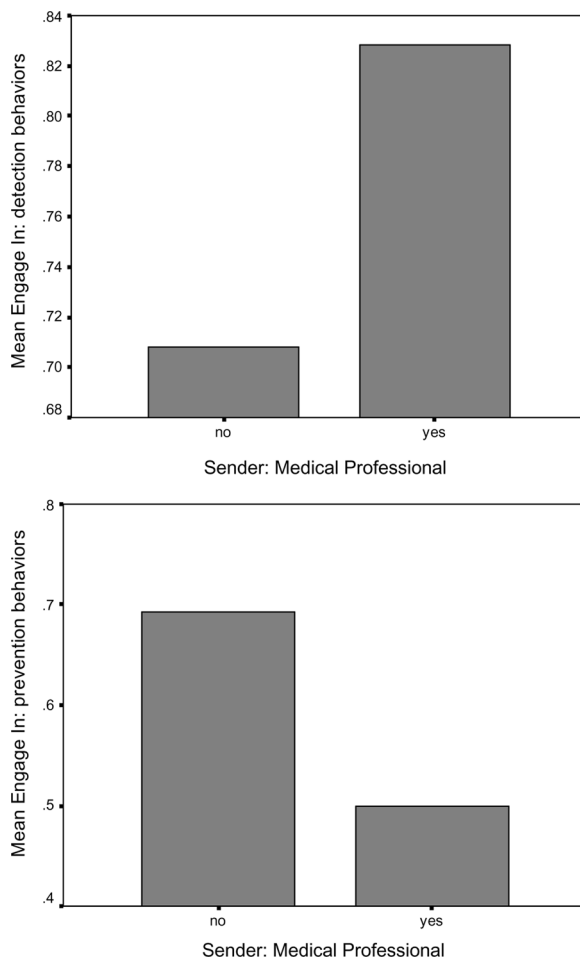


Figure 1. Medical professional's memorable message source relationship with detection and prevention behaviors.

0 to 2. Although the data are categorical, this procedure is meaningful because the categories differ in magnitude rather than in quality. Consequently, the Pearson correlation coefficient as employed here can be interpreted in the usual manner.

Analyses focusing on the relationship between memorable message source and reported behavioral outcomes revealed that memorable messages sent by medical professionals were associated with the topics of behaviors reported by participants. Specifically, messages sent by medical professionals were less likely to be associated with prevention behaviors and more likely to be associated with detection behaviors. Using Pearson's r as a measure of effect size revealed a positive but statistically nonsignificant difference, indicating that there was a trend for messages sent by medical professionals to result in *more* detection behaviors than messages sent by other message sources, $r = .11$, $n = 212$, $p = .11$, $P(-.02 \leq \rho \leq .24)$. On the other hand, memorable messages sent by a medical professional resulted in significantly *less* prevention behavior than messages sent by other message sources ($r = -.16$, $n = 210$, $p < .05$, $P(-.29 \leq \rho \leq -.03)$). Further examination of the .95 confidence

intervals of these two correlations indicated that their difference is statistically significant. Thus, memorable messages originating from medical professionals were substantially more likely to be associated with subsequent detection behaviors rather than prevention behaviors. Figure 1 illustrates this effect. Simply put, the answer to RQ3 is that all topics of memorable messages about breast cancer were equally likely to motivate prevention and detection behaviors, as were all sources except medical professionals. Messages sent by medical professionals were less likely to promote prevention behaviors.

Discussion

Breast cancer is a major health issue in the United States, and most women are exposed to the disease directly or indirectly. Breast cancer messages are also prevalent in society. Messages that motivate women toward prevention and detection behaviors are valuable because they have the power to decrease the occurrence of the disease and save lives. The data from this study indicate that memorable messages about breast cancer are associated with women's engagement in both breast cancer prevention and detection behaviors. This study also found that memorable breast cancer messages have four main message topics and sources, respectively.

Categories of memorable breast cancer messages included detection, awareness, treatment, and prevention of the disease. The most frequently recalled memorable messages related to detection and the least recalled were messages about prevention. The relative paucity of prevention messages is consistent with several facts. Although about 70% of women in the United States in 2005 reported engaging in the detection behavior of getting a mammogram within the previous 2 years (American Cancer Society, Inc., 2007b), 52% of adult females in the United States are overweight or obese (U.S. Department of Health and Human Services, 2006). This is a largely preventable condition associated with increased risk for breast cancer (American Cancer Society, Inc., 2006). In other words, women are both less likely to recall messages associated with prevention, and they are less likely to enact certain prevention behaviors. Ironically, prevention efforts have been found to have a wider array of benefits compared with early detection behaviors (Kaplan, 2000).

Perhaps features of preventative messages are not as memorable as other topics. Possibly selective attention plays a role because preventative behaviors are not as readily performed as detection behaviors. For example, although inconvenient, breast self-exams and mammograms are simple and can be performed at specific time intervals. On the other hand, engaging in a regular exercise and healthy diet regimen requires more time and resources. Consequently, it is possible that less cognitive capital is allocated to prevention messages than detection messages and women do not store prevention messages in long-term memory as readily. Additionally, these acts apply to many diseases besides breast cancer and therefore may not be recalled for this specific disease. More research is necessary in order to investigate these possibilities and design messages to overcome these potential barriers to prevention behaviors.

Four primary sources of breast cancer memorable messages that are similar to previous research on typical messages that are sent to women were also found: health care professionals, media sources, friends, and family. Media sources like celebrities and journalists were sources of the most memorable breast cancer messages, yet as

numerous studies suggest media-sourced messages often present incorrect or incomplete information about health topics (Dornbusch, 1998; MacKenzie, Chapman, Barratt, & Holding, 2007; Moynihan et al., 2000; Nakahara, Ichikawa, & Wakai, 2007; Pruitt & Mullen, 2005). For example, media sources have been found to be responsible for overpublicizing the role of genetic factors in women's risk for breast cancer, when they account for 5% to 10% of a woman's risk (American Cancer Society, Inc., 2006; Henderson & Kitzinger, 1999; Jones et al., 2006; Sagi, Kadur, Zlotogora, & Peretz, 1998). The inflation of genetic factors has been observed particularly with certain ethnic minorities, resulting in minority "ownership" of diseases like breast cancer (Donelle, Hoffman-Goetz, & Clarke, 2005). Moreover, other work has found that although media sources do an excellent job of disseminating information, the influence they have on behavior is much weaker (Chaffee, 1982); this finding should concern the health communicator who is interested in activating behavior.

In contrast to messages from media sources, interpersonal communication has been found to have a stronger effect on actual health behavior change than the media (Dutta-Bergman, 2004). Importantly, these data indicate that when considered together, messages from family and friends account for more breast cancer memorable messages than media sources, representing a great opportunity to transmit messages that increase both preventative and detection behaviors.

Surprisingly, memorable messages originating from medical professionals were the least frequently recalled. Previous research indicated that doctors are the primary source of medical information (Meissner et al., 1992; O'Malley et al., 2001; Pecchioni & Sparks, 2007; Rees & Bath, 2000). Possibly the high stress, anxiety-provoking nature of the physicians' office visit creates a situation that inhibits storage of the medical professional's message into memory. We cannot discount, however, the need for improved doctor-patient communication identified in several studies (Meissner et al., 1992). Clearly, despite the fact that memorable messages originating from medical professionals were the third most frequently recalled, messages from medical professionals are exceedingly important.

Indeed, messages from medical professionals were found to have the largest impact on women's reported behaviors, specifically increased engagement in detection behaviors and decreased engagement in prevention behaviors. These findings suggest that the medical profession needs to encourage patients pervasively and persuasively to perform prevention behaviors. The observed effect is possibly due to a side effect of a health system focused primarily on detecting and treating diseases rather than working to prevent the disease from occurring. Perhaps this effect can be counteracted by regular visits with a primary care physician. Research has shown that participating in regular visits with a consistent primary care physician can triple a patient's likelihood of receiving preventative care information (Ettner, 1999). Most women do regularly visit a primary care physician, and these visits tend to increase as they get older (U.S. Department of Health and Human Services, 2001). This solution may not be possible for many Americans, however, as over 40 million (nearly 15%) do not have health insurance according to 2004 estimates by the U.S. Census Bureau (2004). People in these low-resource groups may visit a medical professional only when a problem is manifest.

Although this study produced some interesting findings, it is not without limitations. The method by which participants listed the source of their

memorable message allowed participants to select more than one source per message. To prevent double counting, the first source that respondents reported was considered the source of the memorable message. This decision forced respondents to report one source even though some messages might be memorable because they were heard from multiple sources. Additionally, participants did not receive direction to recall their memorable messages verbatim. Finally, this study was based on a snowball sample composed mostly of Caucasian females with a bachelor's degree or higher level of education. Although the demographic of this sample does include diverse characteristics, it is restricted particularly on the education variable; therefore, the results may not be generalizable to less educated members of the general population.

Conclusion

This study was designed to determine the sources and topics of memorable breast cancer messages. The results reveal that although messages regarding breast cancer awareness, treatment, detection, and prevention that are sent by the media as well as by friends and family are the most likely to be remembered, messages sent by medical professionals had the most impact on behaviors. This study leaves future researchers with at least two immediate directions for future research. First, this study identifies several common topics and sources of memorable breast cancer messages. Research exists that demonstrates the power of memorable messages to influence behavior. What the previous literature did not reveal, however, is how the different topics of memorable breast cancer messages identified in this study work to influence the behaviors of those who recall the message. By understanding how and why the messages influence behavior, the second direction of future research can be followed. Specifically, by knowing the processes behind the relationship between memorable breast cancer message recall and behavior change, it might become evident that some messages influence behavior more strongly than others, depending on situational features such as the source of the message. Health communicators could use this information to intertwine messages' topics and sources into breast cancer messages in an attempt to influence at-risk populations effectively. Additionally, future research could perform laboratory experiments using detection and prevention messages to see which messages are most readily recalled to attempt to explain further the paucity of prevention memorable breast cancer messages reported.

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