

Persuasive Communication Strategies in Breast Self-Awareness Messages: An International Perspective

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Persuasion theories specify variables that influence attitudes and behaviors. Nevertheless, specifying causal paths and crafting theory-based messages are separate endeavors. There are too few exemplars of theory-based messages for research and practice. This study reviewed the use of theory in Breast Self-Awareness (BSA) messages from 31 nations. BSA enables early detection of breast cancer, a global health concern, with 2 million new cases annually. Results show that hope and fear emotional appeals were common. Severity was communicated in nearly all fear appeal messages and susceptibility in 50%. Across countries, most messages featured a White woman. Self-efficacy was more prevalent than response efficacy. Gain-framed appeals were dominant, and half of the messages included an explicit cue to action. Messages focused on individualism, with collectivism notably absent. Overall, messages did not provide arguments against BSA. Nevertheless, no messages communicated BSA as typical behavior. Recommendations for message design and health promotion are provided.

Keywords: persuasion, content analysis, breast cancer, communication theory, global health

Kline and Mattson (2000) argued that most efforts to apply persuasion theory to the design and evaluation of communication campaigns are guided by audience data. Their work, a content analysis of breast cancer screening messages, is an example of research that is complementary to an audience-driven approach yet grounded in the same set of theories. Message designers have little guidance to offer about how to craft theory-based persuasive messages. This continues to be a deficiency in the persuasive communication subfield of message design and effects. This study aims to identify messages that fit definitions of key theoretical constructs in persuasion theory. The goal is not to test message effects on an audience directly (this objective is covered elsewhere) but rather to review what content is being covered, which theories are being used, how accurately theory is being implemented, and what is absent. It is likely that the deficits identified here are also present in other contexts. For example, if two theoretical constructs work together to affect an outcome and one is not present in a message, from a theoretical perspective, the message is less likely to cause attitude or behavior change. A data set of messages about Breast Self-Awareness (BSA), from 31 nations, was created and analyzed. BSA is an informal behavior, completed at

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home, to look and feel for breast changes. The public health recommendation is that women should be familiar with how their breasts normally feel and look. If a change is noticed, a follow-up with a provider should be scheduled (American College of Obstetricians and Gynecologists, 2020; National Health Service, 2020). Some breast changes are not caused by cancer, but BSA allows women to take an active role in their health. BSA can lead to early detection of cancer, in some cases.

Breast cancer is a global health concern, with over 2 million new cases diagnosed annually (Bray et al., 2018). It is the second-most prevalent and fifth-deadliest cancer worldwide (World Health Organization [WHO], 2020). Despite these facts, when detected in early stages, breast cancer can often be treated. Abnormalities in breast tissue can be detected in multiple ways including mammography or by BSA. BSA includes breast self-exams (BSEs), a more formal procedure. In 1949, the American Cancer Society (ACS) launched the first BSE campaign with the national distribution of a teaching film (Eggertsen & Bergman, 1983). In the decades that followed, BSEs were recommended by healthcare providers and expert groups worldwide (Nekhlyudov, Barton, Elmore, & Fletcher, 2002). In 2009, specific BSE recommendations were dropped by the ACS, an independent nonprofit and global leader in cancer research and information dissemination, citing that BSEs do not reduce mortality. The United Kingdom's National Health Service also promotes a general BSA message, that women be familiar with how their breasts normally look and feel and discuss any changes with a doctor.

In developing countries, however, BSE is still recommended. There are compelling reasons to promote BSA worldwide, alongside mammography. The preventive actions serve different purposes. Mammography can detect breast cancer before women see or feel a lump, whereas BSA encourages women to be observant about their bodies and alert a healthcare provider if they notice a change (Birhane et al., 2017). Among the available methods for detecting abnormalities, BSA is the most convenient, least expensive, and does not require equipment or an office visit. These features make BSA particularly useful in countries where essential care is limited because of poverty, staff shortages, or underutilization of health services. Nearly all Indian breast cancer patients, for example, self-detect their disease, because of limited access to mammography (Agarwal, Pradeep, Aggarwal, Yip, & Cheung, 2007). Assessments that can be done privately at home are superior to no assessment at all. In addition to access issues, the discussion of breast screenings is a private and even taboo subject in some cultures. In the United States, public discussion of breast cancer is recent. In 1974, first lady Betty Ford announced her breast cancer diagnosis, bringing the conversation to the public domain for the first time. It is easy to underestimate the importance of Ford's announcement. Before this time, even saying the word breast in public conversation was unthinkable for many. In some cultures, the stigma of breast cancer is so great that women are abandoned by their families after diagnosis (Nyblade, Stockton, Travasso, & Krishnan, 2017). In data from Jordan, 25.5% of respondents stated that they would undergo mammography only if their families agreed (Suleman, 2014). Jordan is an Arabic culture that is patriarchal and collectivist. Family members have a responsibility for protecting the unity and honor of the family unit (Ibrahim & Howe, 2011). In addition to the private nature of this health behavior, there is also evidence that efficacy and knowledge about breast changes are low. In Nigeria, researchers found that 70% of women felt uncertain about how to perform a BSE and 92.5% had never performed one (Obaji et al., 2013). Over 70% of participants in Malaysia reported low self-efficacy in performing BSEs (Loh & Chew, 2011).

Given this, it is useful to consider the messages women are receiving about BSA. A movement away from recommending specific procedures to a more general message of BSA makes communication even more critical. There is evidence that mass media use is associated with preventive cancer screening (e.g., Redmond, Baer, Clark, Lipsitz, & Hicks, 2010). Thus, it is fruitful to examine the content that is being presented through a theoretical lens. Nevertheless, public awareness is not always related to accurate knowledge or desired behaviors. Messages can be misleading implicitly or explicitly. In Australian media, breast cancer campaign, messages overrepresented women under the age of 40. Concurrently, most women surveyed incorrectly believed that those under age 50 are at the highest risk (Jones, 2004). Providing further evidence of misinformation, a review of breast cancer images in Canadian magazines concluded that women featured were more likely to be Caucasian and under age 50 (McWhirther, Hoffman-Goetz, & Clark, 2012).

Previous research has conducted message-based analyses and provides a foundation for this project. In a content analysis of BSE pamphlets, Kline and Mattson (2000) found an unbalanced proportion of threat to efficacy arguments, and the efficacy messages were substantively weak. Skubisz, Miller, Hinsberg, Kaur, and Miller (2016) found a similar pattern in a smoking cessation campaign: Just 27.9% of messages communicated self-efficacy and 13.9% communicated response efficacy. Additionally, in a content analysis of coverage in advertisements, AbiGhannam, Chilek, and Koh (2018) found susceptibility to breast cancer in 13% of messages, frequency of breast cancer in 8.3%, and severity of breast cancer in 14%. Finally, a study of naturally occurring memorable messages about breast cancer concluded that three times as many gain-framed messages were reported than loss-framed messages (Lauckner et al., 2012).

Building upon this work, the current study coded campaign messages for the presence of message design variables from influential behavioral-focused persuasive communication theories (Zhao, 2020). This includes the Extended Parallel Process Model (EPPM), emotional appeals, social norms, observational learning, the Health Belief Model (HBM), evidence, framing, and source cues. These variables were selected because they can be communicated in a message. These variables have also been shown in previous research to predict BSA behavioral intentions and behavior (Chen & Yang, 2018; Luszczynska, 2004; Meyerowitz, & Chaiken, 1987; Mousavi, Shojaei, & Homasan, 2018). Variables that are predictive of cancer screening but that cannot be communicated in a message were excluded (i.e., behavioral intentions, behavioral capacity). A review of these variables in the context of BSA is provided in the sections that follow.

Behavioral-Focused Persuasive Communication Theories

Extended Parallel Process Model

Persuasive messages can be designed to communicate specific discrete emotions. Emotions are related to behaviors and in a message, emotional appeals can be used to motivate the audience to take recommended actions to increase positive health outcomes or reduce negative health outcomes. According to the EPPM, fear messages aim to make a receiver feel uncertainty or threat. Fear appeals, communicating severity and susceptibility, encourage receivers to take a recommended action to cognitively rid themselves of the fear caused by the message (Witte, Meyer, & Martell, 2001). To be motivated to act, a person must have high self-efficacy, defined as confidence in the ability to carry out the recommended behavior (Bandura, 1977). In addition, a person must have response efficacy, defined as confidence the

recommended action will be effective in solving the presented problem (Rogers, 1975). If a person feels fear after receiving a fear appeal, she should feel motivated to take action to reduce the negative feelings through defensive strategies or precautionary measures. A person with high self- and response efficacy will spend more time cognitively processing a message and will be more likely to attempt a recommended behavior. In the context of BSA, it is established that threat (severity and susceptibility) and efficacy interact to produce outcomes. Chen and Yang (2018) found a significant two-way interaction between threat and efficacy; women who received messages that contained high threat and high efficacy had the highest intentions to complete a BSE. Meta-analyses have concluded that fear appeals used in combination with efficacy messages are more effective at changing behavioral intentions and behaviors, compared to fear appeals alone (Boster & Mongeau, 1984; Mongeau, 1998; Sutton, 1982; Witte & Allen, 2000). Fear appeals are widely used in health communication but message design is challenging. Communicating severity, susceptibility, self-efficacy, and response efficacy in a single message is difficult (Stolow, Moses, Lederer, & Carter, 2020). Another concern is the maladaptive responses that can be evoked by fear appeals. A meta-analysis of the fear appeal literature conducted by Witte and Allen (2000) concluded that fear appeals should be used cautiously and they may cause reactance if receivers do not feel able to avoid a threat.

Emotional Appeals

Discrete emotion theorists link the function of specific emotions to certain action tendencies (Frijda, 2007; Lazarus, 1991). In addition to fear, discussed above, hope and humor appeals have been proposed as message design features that can reduce anxiety about cancer-prevention behaviors and increase the uptake of screening behaviors. Anxiety is a barrier to preventive health behaviors making reduction advantageous (Nabi, 2016). Hope is defined as yearning for a good outcome or the amelioration of a dreaded outcome (Lazarus, 1991). Lazarus and Folkman (1984) argued that hope leads to problem-solving activities (such as engaging in BSA) when a person believes that she has control over the situation (self-efficacy). Frisby (2002) found that participants exposed to messages of survival and hope expressed greater interest in seeking early detection for breast cancer, compared to those who viewed messages that focused on positive affect alone. Hope appeals aim to reduce negative affect and increase positive outlook. Following a message with a hope appeal, a receiver should feel positive that good things will occur (Nabi, 2002). Turning now to humor, these messages are designed to appeal to a receiver's sense of absurdity, eliciting an amused expression. To communicate traditional or dark humor, messages can include satire, irony, sarcasm, puns, comparisons, or hyperbole (Markiewicz, 1974). Humor is associated with positive feelings and is predicted to moderate stress by reframing the situation (Martin, 2007). Negative emotions, like fear, are typically more powerful than positive emotions, like hope and humor, at inducing behavioral responses (Lazarus, 1991). For example, women with memorable messages evoking negative emotions were more likely to engage in detection behaviors than women reporting memorable messages that evoked positive emotions (Smith et al., 2010).

Norms and Observational Learning

Social-norms research has described the persuasive effects of normative influence, defined as the process by which people look to important others as guides for how to behave (Shulman et al., 2017). Injunctive norms provide a directive of what ought to be done or avoided. Descriptive norms communicate what is considered typical behavior. Norms are predictors of behavioral intentions or behavior in multiple models of persuasion, including the Theory of Planned Behavior (Ajzen, 1991). Knowledge acquisition and

behavioral intentions are directly related to observing others (Bandura, 1977). This can be achieved through norms messaging or the modeling of advocated behaviors. Vicarious experience refers to information that is gained by observing another person encounter a situation or complete an action (Bandura, 1977, 2001). Exemplars model behaviors and can promote observational learning in receivers. Exemplars may also motivate viewers through affective processes and can increase self- and response efficacy. Exemplars that are perceived as similar to the receiver are predicted to be more effective at this (Singhal & Rogers, 2002). There is evidence that mediated behavioral modeling is effective in teaching BSE skills and influencing self-efficacy (Anderson, 2000).

Health Belief Model

The HBM argues that susceptibility, severity, barriers, benefits, and cues to action predict the likelihood that a person will adopt a preventive behavior (Rosenstock, 1974). In this context, susceptibility is a perceived probability of developing breast cancer and severity is how serious the disease is perceived to be. This includes social consequences (Janz & Becker, 1984). Messages may also address barriers to taking action steps to perform the desired behavior (e.g., time, knowledge) or benefits of performing the behavior (e.g., peace of mind, early detection). Cues to action can be implicit (action step is inferred) or explicit (action step is plainly stated; Mendelberg, 2008). Champion (1988) provided evidence for the combined ability of susceptibility, severity, and barrier reduction to predict BSE intentions.

Evidence

Evidence is a fundamental component of argument that affects attitudes and behaviors in multiple ways. Quantitative evidence is empirically quantifiable information; whereas, qualitative evidence includes narratives, personal anecdotes, stories, and testimonies. Quantitative messages that include statistics produce more positive and negative thoughts, generate higher ratings of message credibility, and produce a lower level of anxiety compared with qualitative messages (Reinard, 1988). As evidence, numbers are precise, credible, and can be verified for accuracy (Skubisz, Reimer, & Hoffrage, 2009). Yet, quantitative messages vary and can be expressed in terms of probabilities or frequencies. Probability values range from 0 (an event will definitely not happen) to 1 (an event will definitely happen). Frequencies result from counting specific cases within a specific reference class. Percentages are found when a message includes either probabilities or frequencies. Some numerical representations are cognitively easier to understand than others. When statistics are expressed as frequencies, statistical thinking is improved (Hoffrage, Lindsey, Hertwig, & Gigerenzer, 2000; Skubisz, 2018). In addition, a verbal expression of risk (e.g., rarely) can be used to communicate severity and susceptibility, or evidence can be presented as a statement of fact. Other research has found qualitative evidence to be more persuasive than quantitative. In his often-cited 1988 piece, Reinard concluded that, all things being equal, anecdotal reports may have a more persuasive impact than statistics. Anecdotes have been shown to have a strong influence on judgments and decisions. Fisher's (1985) theoretical framework, the narrative paradigm, argues that all meaningful communication is in the form of storytelling.

Message Framing

Several types of message framing are relevant to persuasive communication in this context. First, messages can be framed individualistically, where personal goals and achievements are promoted as the outcome of a recommended action. Self-reliance and independence are touted in this message type. Alternatively, behavioral outcomes can be framed as having collective benefits, where each person is encouraged to be an active player in society and do what benefits the whole (i.e., family, workplace, church). Collectivism values selflessness, cooperation, and support of the social environment. According to Hofstede's (1984) cultural dimensions theory, cultural values exist on a continuum from individualism to collectivism. In collectivistic cultures, social interdependence and group loyalty are valued. In individualistic cultures, people prioritize personal interests over those of the group. This analysis will examine the match between culture classification and messages disseminated in those countries.

Second, the consequences of health behaviors can be framed in terms of gains or losses. Gain-frame messages emphasize the benefits of performing a behavior; whereas, loss-framing emphasizes the disadvantages of failing to perform a behavior. The strengths and weaknesses of positive versus negative framing in the context of health have been studied extensively (see O'Keefe & Jensen, 2008, 2009). Loss-framed appeals have a small, but statistically significant advantage for messages that advocate behaviors related to breast cancer detection. This advantage does not hold for any other cancer-detection behaviors, dental problems, or other diseases (O'Keefe & Jensen, 2009).

Finally, message sidedness is an enduring construct in the persuasion literature. A one-sided message presents arguments that favor the position advocated by the source and a two-sided refutational message presents arguments opposing and supporting the source's position (Hovland, Lumsdaine, & Sheffield, 1949). Two-sided refutational messages are generally more persuasive than one-sided (Allen et al., 1990; Hale, Mongeau, & Thomas, 1991). One-sided messages are more effective when the audience is already on the side of the advocated position, whereas two-sided messages are more effective for those initially opposed to the position advocated (Hovland et al., 1949). Arguments for and against BSA are present in the media; thus, this message feature will be examined. Since 2009, some expert groups, including the U.S. Preventive Services Task Force (Siu & U.S. Preventive Services Task Force, 2016) recommend against clinicians teaching women how to perform BSEs.

Source Cues

Messages are communicated by a source: the organization or the spokesperson featured in the message. The person or organization delivering content affects how the audience will react and process the information. Trivedi, Krakow, Hyatt Hawkins, Peterson, and Chou (2020) asked participants how they decide whether to trust health information. Most participants stated that they look at the source. Specifically, government agencies and nonprofit health organizations were trusted more than lay individuals with no clear affiliation. In addition to the organization's name, a message often features people who have characteristics that interact with the message being communicated. The demographic and psychographic similarity between the message source and receivers has been shown to result in positive behavioral outcomes (Durantini, Albarracín, Mitchell, Earl, & Gillette, 2006). Source-receiver similarity facilitates

persuasion by increasing positive emotional responses. Source cues can also serve as implicit descriptive norms (i.e., the race of a person featured can be perceived as representative of a typically affected person).

Method

BSA Messages

A message set was formed using the Coloribus archive, a database of international advertising. The following search terms were used to identify relevant messages: breast cancer, cancer help, early detection of breast cancer, breast awareness, breast self-awareness, feeling breasts, breast test, lump, breast touch, BSE, breast-self exam, breast cancer self-exam, and breast self-examination. BSA is the more recent umbrella term that encompasses BSE, thus search terms including BSE were used. Messages dated between 1999 (the earliest date in the archive) and 2015 were selected. The initial search, casting the widest net possible using the search terms above, yielded 807 messages. Messages were excluded if an English translation was unavailable, if BSA was not mentioned, if a different screening procedure alone (i.e., mammography) was mentioned without BSA, or if low image quality made the text indecipherable. Some messages were about breast cancer in general or showed a pink ribbon, without any specific health behavior; these messages were excluded. Zero messages advocated against BSA. In total, 167 messages from 31 nations formed the final data set. The countries of the United Kingdom were grouped by Coloribus and could not be analyzed separately. Messages included both commercial advertising and public service announcements sponsored by public, private, and government organizations.

Measurement and Coding

A codebook was created to assess the message variables of interest. Each message was evaluated in its entirety, which included the text, spoken word, audio, video characteristics, and graphic components. Using the EPPM as a framework, severity was present if the message communicated the seriousness of breast cancer and susceptibility was present if the message communicated that the receiver was personally at risk. Messages were coded for the presence of emotional appeals including fear, hope, and humor—three discrete emotions that are common in breast cancer messaging. Messages were also examined for the inclusion of injunctive and descriptive norms, modeling, cues to action, barriers, self-efficacy, and response efficacy. Evidence presented in the message was categorized as frequency, visual icon display, percentage, probability, verbal expression, other visual evidence, or qualitative narrative. Arguments made within the message were coded as one- or two-sided. The message frame was analyzed by examining the inclusion of individualism, collectivism, gain framing, or loss framing. Finally, source cues, including the presence of a sponsor and the characteristics of the people present in the message, were coded.

A codebook, published in Skubisz et al. (2016) and Swann (2021), was used for data analysis. Two independent coders were trained to use the codebook. To establish intercoder reliability, 17% of the data set was analyzed by both coders. When disagreements occurred, the coders discussed the coding criteria, and decision rules were established before the next round of coding began. Once intercoder reliability was established, all of the campaign materials were coded and the results were aggregated. Individual coding categories had a Cohen's Kappa score ranging from 0.58 (moderate agreement) to 1 (perfect agreement).

Overall, coders had an average agreement of 85% with a Cohen's Kappa of 0.61, indicating substantial agreement (Cohen, 1960).

Results

Messages in this data set represent 31 nations (see Table 1). The most frequently represented areas were the United Kingdom ($n = 21$), Brazil ($n = 17$), Canada ($n = 16$), and India ($n = 13$). In the sample, 63% ($n = 105$) of messages were poster style (print or electronic), 31% ($n = 52$) were video, and 6% ($n = 10$) were audio.

Table 1. BSA Messages by Nation.

	Total	Print	Video	Audio
Australia	8	1	3	4
Brazil	17	14	2	1
Canada	16	3	12	1
Colombia	2	1	1	0
Finland	2	1	1	0
France	1	0	1	0
Germany	6	6	0	0
India	13	12	1	0
Israel	1	0	1	0
Japan	1	0	1	0
Kuwait	1	1	0	0
Malaysia	8	7	1	0
Mexico	1	0	1	0
Mozambique	7	7	0	0
Netherlands	6	6	0	0
New Zealand	6	3	3	0
Oman	2	2	0	0
Philippines	3	1	2	0
Portugal	3	2	1	0
Puerto Rico	2	2	0	0
Romania	2	2	0	0
Scotland	2	0	2	0
Singapore	9	7	2	0
Slovakia	4	3	1	0
South Africa	3	3	0	0
Spain	5	1	3	1
Sri Lanka	2	2	0	0
UAE	2	2	0	0

United Kingdom	21	11	8	2
United States	9	3	5	1
Venezuela	2	2	0	0
Total	167	105	52	10

EPPM

The most frequently communicated emotion in the data set was fear; 65 messages (38.9%). Fear appeals described negative outcomes including removal of a breast, death, or images of surgical stitches. For example, a message from Singapore provided the number of breast cancer deaths in the country per year. An effective fear appeal communicates a threat: severity and susceptibility of breast cancer risk in this context. The severity of breast cancer was communicated in 104 messages (62.3%) overall and was present in 97% ($n = 63$) of messages that contained a fear appeal. For example, a message from Mozambique visually depicted breast cancer as a scorpion hiding under a woman's skin. Breast cancer was compared to a deadly, lurking creature. The susceptibility of the receiver to breast cancer was present in fewer messages overall (55 or 32.9%). In messages with fear appeals, susceptibility language was present in 35 of the 65 (53.8%) messages. These messages addressed common myths about women who are susceptible. It is often misunderstood that breast cancer can be diagnosed regardless of age, race, breast size, or shape. Messages communicated that breast cancer knows no age and breast size or shape does not affect risk. Messages from Mozambique positioned breast cancer as the enemy by featuring superheroes urging women to fight back using BSA. These messages also communicated susceptibility by stating that no woman is a "superwoman," meaning every woman is at risk and no one is invincible.

Messages were coded for the presence of self- and response efficacy. In the data set, 73.7% of messages communicated self-efficacy. These messages demonstrated that performing a BSA was easy to do, inexpensive, and the receiver had the necessary knowledge and skills to carry out the behavior. For example, one message from Kuwait pictured two balloons, one popped and the other filled with air. Self-efficacy was explicitly stated by communicating that women can detect breast cancer before it is too late. Similarly, a message from Singapore explained the ease of completing a BSA by referring to the behavior as simple and telling women that prevention is in their hands. In terms of response efficacy, 47.3% ($n = 79$) of messages communicated that BSA was effective for early detection or saving lives. Overall, 25 messages (15%) included all constructs of the EPPM (severity, susceptibility, self-efficacy, and response efficacy). Thirty-two messages communicated threat (severity or susceptibility) without efficacy.

Hope and Humor

Of the two positive emotions, hope was the most common, present in 50 messages (29.9%). Hope appeals communicated the benefits of BSA and how early detection can allow patients to begin treatment early in disease progression. Hope messages communicated the chance to grow old and live a long life with early detection, looking forward, and high chances of survival. Humor appeared in 28.1% ($n = 47$) of messages. These messages often included humor as an unexpected ending. A message from Japan, for example, depicts a robbery of a female store clerk. Instead of instructing her to open the cash register, he instructs her to perform a BSA, as if it is a matter of life or death.

Norms and Modeling

Injunctive norms, specifying what ought to be done or be avoided, appeared in 136 (81%) messages. A message from Oman told women not to ignore breast changes and miss the first signs of breast cancer. A message from Singapore shows the Facebook logo replaced with a hand. The text told women to be as mindful about BSA as they are about checking social media. Missing a status update will not hurt you, but breast cancer can hurt you. Descriptive norms communicating typical BSA behavior were not present in any messages. Social norms, codes of behavior in a group or culture, can be communicated visually by the source-of message sender or individuals featured in a message. The race of the message sources was collected and 25% of messages that featured more than one person included people of more than one race. In the data set, 19 messages featured a single person whose race could be coded. White message sources occurred more frequently than all other races (in the 16 messages with a single source). India and South Africa had the most misrepresentation between message and audience. The messages for those nations feature White sources only; yet, the population of these nations is less than 10% White. Finally, turning to norms, BSA behaviors were modeled in 20.4% of messages ($n = 34$). Most typically, messages gave instructions for performing a BSA with pictures showing the steps.

Health Belief Model

Eighteen messages (10.8%) mentioned a barrier to BSA. Barriers included: inaccurate beliefs that men cannot get breast cancer, lack of time, uncertainty about the correct technique, forgetfulness, fear, embarrassment, and feeling low risk. Messages were also coded for the presence of a cue to action, a recommended behavior. Fifteen (9%) messages had no cue to action present, 68 (40.7%) had an implicit cue to action, and 84 (50.3%) had an explicit cue to action. Examples of explicit cues to action were: check for breast cancer monthly, text for a free monthly reminder, and tell us what normal feels like for you. Only five messages (3%) included all HBM constructs of severity, susceptibility, self-efficacy, cues to action, and barriers. Barriers were not measured.

Evidence

Thirty-nine messages (23.4%) included quantitative, numerical evidence. Of these, 13 included frequency data, five included a percentage, two included a probability, and 19 communicated aggregate data with a verbal statement. Nineteen messages (11.4%) presented qualitative data. For example, a message from Canada featured a woman beneath a set light. It told viewers that she was discovered (found fame) at age 39 but her breast lump was discovered at age 37. Most messages presented one or more facts ($n = 111$, 66.5%) including, that it is normal for breast tissue to feel lumpy.

Message Framing

Ninety-two messages (55.1%) presented gain-framed appeals and 26.9 ($n = 45$) presented loss-framed appeals. An example of a loss-framed message from Malaysia communicated that losing a breast is more tedious than checking your breasts once per month. Gain framing was more common for example: there is a better chance of a cure with early detection (Brazil) and knowing what normal breast tissue feels

like can save your life (United Kingdom). The data had no variance in terms of message sidedness. One-sided arguments advocating for BSA were present in 166 messages (99.4%). None of the messages in the data set were two-sided or included any negative information about BSA. Turning to cultural orientation, individualism was present in 122 messages (73.1%). Collectivism, emphasizing family and selflessness, was seen in 16 (9.6%) messages. Finally, 23 messages (13.8%) contained both individualistic and collective appeals. Overall, most messages were individualistic in nature, even in nations with a collective culture, such as Brazil, India, Singapore, and Oman. Table 2 presents data for all messages.

Table 2. Individualism-Collectivism Classification and Message Framing.

	Classification (I = Ind, C= Col)	Individualistic	Collective
United Kingdom	I	17	1
Brazil	C	15	0
India	C	9	1
Canada	I	8	4
Malaysia	C	8	0
Singapore	C	6	0
Netherlands	I	6	0
Germany	I	5	1
Australia	I	5	0
Spain	I	4	0
Slovakia	I	3	1
Mozambique	C	3	0
Portugal	C	3	0
Romania	C	2	0
Australia	I	2	0
Philippines	C	2	0
Sri Lanka	C	2	0
Venezuela	C	2	0
Colombia	C	2	0
South Africa	I	2	1
Scotland	I	2	0
United States	I	2	4
Oman	C	2	0
UAE	C	1	0
Puerto Rico	C	1	1
New Zealand	I	1	1
Finland	I	1	1
Kuwait	C	1	0
Japan	C	1	0
France	I	1	0

Source Cues

Message sources were analyzed and coded for the following characteristics: sponsor(s) mentioned, sponsor(s) names, number of people present, and race/sex of people present. All messages in the data set provided at least one sponsor. Sponsors included private corporations (e.g., Avon), pharmaceutical companies (e.g., Novartis), nonprofit organizations (e.g., Susan G. Komen), and publicly funded health organizations (e.g., National Health Service).

Most messages featured at least one person (74.3%, $n = 124$), and 33.5% ($n = 56$) of messages presented more than one person. Race was not coded in audio-only messages. Sixty-eight messages featured a single person, and when only one person was present, that person was typically a woman (84%, $n = 58$). In messages with multiple people ($n = 55$), 21.6% featured both men and women, 1.8% featured men only, and 8% featured women only. The messages with women only were typically collective-framed, and often referenced how women were in the cancer fight together. Fifty messages featured this variable pairing of women-only and collective frame. When present, men were typically represented as support figures to women. Only one message in the data set mentioned male BSA. Seven messages featuring men used humor appeals, including a Canadian message "Call-Cam." This message featured a group of young adult men in their parents' basement. One man, named Cam urged women to call him if they were too busy to perform their own BSA because he would be happy to assist them with the task. Table 3 presents data for all nations.

Table 3. Race Representation by Location.

	Representation in the Sample	Population Majority Race by Location
Canada	4 White, 1 Asian	White
India	2 White	Asian
Brazil	1 White, 1 Hispanic	White, Multiracial
Finland	1 White	White
Germany	1 White	White
New Zealand	1 White	White
Portugal	1 White	White
Scotland	1 White	White
Slovakia	1 White	White
South Africa	1 White	Black
United Kingdom	1 White	White
United States	1 White	White
Malaysia	1 Asian	Asian

Changes in Message Content Over Time

Finally, data were examined to compare content before and after the 2009 change to the language in the BSA recommendations (see Table 4). Statistically significant differences were found for multiple variables. Susceptibility, self-efficacy, response efficacy, injunctive norms, explicit cues, quantitative evidence, verbal statements of evidence, facts, and gain-framed messages were more prevalent after 2009.

Table 4. Comparisons Before and After the 2009 Recommendation Change.

	Total	1999–2009	2010 and Later	χ^2 Comparison 1999– 2009 vs. 2010 and Later
Total <i>N</i>	167	99	68	
Fear	65 (38.9%)	37 (37.4%)	28 (41.2%)	$p = .62$
Severity	104 (62.3%)	55 (55.6%)	49 (72.1%)	$p = .03$
Susceptibility	55 (32.9%)	26 (26.3%)	29 (42.6%)	$p = .03$
Self-Efficacy	123 (73.7%)	66 (66.7%)	57 (83.8%)	$p = .01$
Response Efficacy	79 (47.3%)	40 (40.4%)	39 (57.4%)	$p = .03$
Hope	50 (29.9%)	24 (24.2%)	26 (38.2%)	$p = .05$
Humor	47 (28.1%)	28 (28.3%)	19 (27.9%)	$p = .96$
Injunctive Norms	136 (81%)	74 (74.7%)	62 (91.2%)	$p = .007$
Descriptive Norms	0	0	0	n/a
Modeling	34 (20.4%)	20 (20.2%)	14 (20.6%)	$p = .95$
Barriers	18 (10.8%)	13 (13.1%)	5 (7.4%)	$p = .24$
No Cue	15 (9%)	12 (12.1%)	3 (4.4%)	$p = .08$
Implicit Cue	68 (46.5%)	46 (46.5%)	22 (32.4%)	$p = .07$
Explicit Cue	84 (50.3%)	41 (41.4%)	43 (63.3%)	$p = .006$
Quantitative	39 (23.4%)	16 (16.2%)	23 (33.8%)	$p = .008$
Frequency	13 (7.8%)	5 (5.1%)	8 (11.8%)	$p = .11$
Percentage	5 (3.0%)	1 (1.0%)	4 (5.9%)	$p = .07$
Probability	2 (1.2%)	0	2 (2.9%)	$p = .08$
Verbal Statement	19 (11.4%)	6 (6.1%)	13 (19.1%)	$p = .009$
Qualitative	19 (11.4%)	8 (8.1%)	11 (16.2%)	$p = .11$
Facts	111 (66.5%)	59 (59.6%)	52 (76.5%)	$p = .02$
Gain Frame	92 (55.1%)	45 (45%)	47 (69.1%)	$p = .003$
Loss Frame	45 (26.9%)	28 (28.3%)	17 (25%)	$p = .64$
Individualism	122 (73.1%)	71 (71.7%)	51 (75%)	$p = .63$
Collectivism	16 (9.6%)	11 (11.1%)	5 (7.4%)	$p = .42$

Discussion

The purpose of this study was to evaluate the content of messages being distributed about BSA worldwide. Theories of message design and effects provide insight about variables that lead to behavior change. However, finding variable definitions and the crafting of persuasive messages that include or cause these variables are separate endeavors. Message designers continue to have too little guidance to offer about how to craft theory-based messages. This continues to be a deficiency in the persuasion subfield of message design and effects. The current study reviewed what content is being covered, which theories are being used, how accurately theory is being implemented, and what is notably absent. The themes identified here are also present in other data sets and health contexts, showing a pattern of deficits (e.g., Kline & Mattson, 2000; Skubisz et al., 2016).

Overall, emotional appeals were commonly included, with messages communicating hope or fear most frequently. Hope is a common message theme for breast cancer prevention and promotion efforts (Frisby, 2002), and that theme is echoed here in this message set. Those who are risk-averse may be afraid to screen for cancer because of fear that the disease will be found. A message of hope, stating that, if an abnormality is found, then treatment can be successful, is a useful strategy for those individuals. In contrast, we know that fear is effective in motivating behavior (Rogers, 1975). To be most effective, messages should show the severity of the threat, the perceived susceptibility of the receiver, and a recommended response (i.e., cue to action) to reduce the fear caused by the message. Severity was communicated in nearly all messages that contained a fear appeal. In contrast, susceptibility was communicated in just 50% of the fear appeals. This is higher than previously reported content analysis results. For example, AbiGhannam and colleagues (2018) found susceptibility to breast cancer in just 13% of messages and severity in 14%. Overall, there is evidence that people have inaccurate perceptions about what age group has the highest risk for breast cancer (Jones, 2004), making the communication of susceptibility extremely important. Messaging should clearly articulate age-based susceptibility, in particular.

Notably, susceptibility in terms of biological sex was visually communicated well in these data. When people were present in a message, most messages featured a White woman. This exemplar is more representative of sex than ethnicity risk factors for breast cancer. Although men can develop breast cancer, women are far more likely to get the disease. Less than 1% of breast cancers occur in men (WHO, 2021). International statistics on cancer rates report more accurately on geographical location than ethnicity, but we do know that breast cancer rates are highest in North America, Australia, Northern Europe, and Western Europe. Rates are intermediate in Eastern Europe, Latin America, and the Caribbean, and are lowest in Africa and Asia (Torre et al., 2015).

A positive finding in terms of theory-based messaging was that efficacy was presented often, compared to previous content analyses. In the sample, 73.7% of messages communicated self-efficacy, and 47.3% ($n = 79$) of messages communicated response efficacy. Comparatively, Skubisz and colleagues (2016) found that just 27.9% of messages communicated self-efficacy, and 13.9% communicated response efficacy in the CDC's Tips from Former Smokers Campaign. In a content analysis of BSE pamphlets, Kline and Mattson (2000) also found an unbalanced proportion of threat to efficacy arguments and that the efficacy messages were substantively weak. This study did not examine the strength of the efficacy arguments being made, and this is a logical next step in this line of research—examining evidence strength for this and all persuasive theoretical variables. In terms of action steps, some messages did include an explicit cue to action (50.3%), but in general, messages should provide the audience with more explicit information on how to specifically engage in BSA.

In addition, it appears to be a missed opportunity to focus almost exclusively on individualism, not the family and social norms of cancer and cancer screening in BSA messaging. Collective messages, emphasizing families, communities, unity, and selflessness, were seen in just 16 (9.6%) messages. This message type was notably absent in the messages from nations that are culturally collectivist. There is evidence that culturally congruent messages can be effective in terms of attitude and behavior change. The decisions of people who are more communal and relational are influenced heavily by social obligations and fulfilling in-group expectations (Hofstede, 1984). There is research evidence that individuals from

collectivistic cultures are more likely to have a prevention focus and be sensitive to potential losses; whereas, individuals from individualistic cultures are more likely to have a promotion focus and be sensitive to potential gains (Lee, Aaker, & Gardner, 2000). In the sample, gain-framed appeals were more prevalent than loss-framed appeals. Given the evidence that loss-framed appeals have a small advantage for messages that advocate behaviors related to breast cancer detection, this is worth noting.

Finally, it is notable that this study reviewed international BSA messages through a U.S.-centric lens, leading to several limitations. It is possible that some message features were lost in translation. Culturally specific phrases or words can lose nuance when translated. All of the messages analyzed in this data set were translated verbatim by Coloribus, if the messages were not originally produced in English. Messages were excluded from the data set if an English translation was not provided or if the resolution of the electronic message made the text unreadable. These decision rules open up the possibility of relevant messages related to BSA being excluded from the sample. In addition, some culturally specific nuances, particularly in terms of humor, may have been missed by U.S. researchers.

Overall, this research revealed that messages did not argue against self-exams, nor did they try to contest any of the prevailing arguments against BSEs. This is surprising, given that some leading expert groups have stopped recommending that clinicians teach women how to perform BSEs (Siu & U.S. Preventive Services Task Force, 2016). Yet, despite the pro-BSA stance of the message set, no messages communicated descriptive norms that BSA is typical behavior. To allow for norms to influence behavioral intentions to engage in BSA, messages could communicate that BSA is routine health practice.

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