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Articles

Self-Efficacy and Rural Women's Performance of Breast and Cervical Cancer Detection Practices

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Self-efficacy has become an important variable in multiple areas of human performance, including health behavior modification (Bandura, 1997). This study explores variables that lead to women's perceived self-efficacy in performing regular detection practices for breast and cervical cancer. A sample of southeastern U.S. farm women (N = 206) completed surveys that assessed their perceived and actual knowledge of women's cancer detection practices, as well as their perceived social norms and perceived barriers related to obtaining these tests. Regression analyses of these data revealed that perceived peer norms and the barriers of time and embarrassment were significant predictors of women's confidence in their ability to follow through with cancer detection practices. Perceived knowledge and perceived family norms significantly predicted women's perceptions of difficulty associated with cancer detection practices as well as women's confidence in their skills to perform breast self-examination (BSE). Time was also a significant barrier to confidence in performing BSE. Implications for health communication campaigns are discussed.

One tactic often used in designing health messages depends on use of fear appeals (Boster & Mongeau, 1984; Dillard, Plotnick, Godbold, Freimuth, & Edgar, 1996; Witte, 1992), or messages that stress the negative consequences of not complying with a given

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set of recommendations (for a review, see Hale & Dillard, 1995). Although these traditional appeals to emotion can be compelling, communication theory has shown that these messages must instill a feeling of self-efficacy (belief in one's ability to successfully execute a behavior) to achieve maximum effectiveness (Witte, 1992). Domain-specific self-efficacy beliefs are therefore important targets for health communication designers desiring to promote behavior change in a given population (Bandura, 1997). The purpose of this article is to explore the variables that lead to rural women's perceived self-efficacy to perform breast and cervical cancer detection practices. Breast cancer screening tests such as mammography, clinical breast exams, and BSE have been invaluable tools in reducing breast cancer mortality in the United States, yet they continue to be underutilized (NCI Breast Cancer Screening Consortium, 1990). Likewise, mortality rates due to cervical cancer have been steadily declining due to the use of the pap smear as a screening tool, yet some women fail to take advantage of the test (Janerich et al., 1995; Nasca, Ellish, Caputo, Saboda, & Metzger, 1991). Identifying the variables related to perceived self-efficacy will enable health communication researchers to better understand how communication campaigns can play a role in the development of women's self-efficacy in the area of cancer detection.

Self-Efficacy and Health Outcomes

Self-efficacy is an important variable in studies of human performance relating to many areas, including sports competition, career assessment and counseling, and health behavior modification (Bandura, 1997; Harmon et al., 1996; Osipow & Temple, 1996). Its existence in research across these various disciplines lends broad support to the idea that perceived self-efficacy works as a general operating mechanism in human agency (Bandura, 1986). Perceived self-efficacy is defined as people's assessment of their ability to "organize and execute courses of action required to attain designated types of performances," a proposition which calls for "continuously improvising multiple sub skills to manage ever-changing circumstances, most of which contain ambiguous, unpredictable, and often stressful elements" (Bandura, 1986, p. 391). Self-efficacy differs from *response efficacy*, which is one's belief in the effectiveness of a given practice to achieve its intended outcome.

Perceived self-efficacy is often considered to be a generalized construct that crosses disciplinary boundaries, but Bandura (1997) stresses that the strongest relationships exist between domain-specific beliefs and the performance of the related behaviors (Bosscher & Smit, 1998). For example, one study showed that specific self-efficacy beliefs had significant positive effects on osteoarthritis patients' ability to climb stairs (Rejeski, Ettinger, Martin, & Morgan, 1998). Older adults higher in self-efficacy related to exercise were found more likely to engage in routine exercise and participate in sports activities (Conn, 1998). In cancer patients, cancer self-efficacy was significantly related to sickness-related behavior in the areas of ambulation, mobility and body care, alertness, eating, work, sleep, and rest (Beckham, Burker, Lytle, Feldman, & Costakis, 1997).

In addition to these types of physiological outcomes, self-efficacy has proven to be a powerful predictor of disease prevention and detection behaviors (Schwarzer & Fuchs, 1995). The consistent prominence of self-efficacy in health behavior research has resulted in the presence of this construct in some form or another in all of the social cognitive health behavior models, including the health belief model, protection motivation theory, and the theory of reasoned action (Maddux, Brawley, & Boykin, 1995). One reason for the staying power of self-efficacy in these models stems from its evident ecological validity: People's beliefs that they are capable of regulating their own behavior do play a crucial role in predicting whether they choose to engage in or continue any type of health

promotion activity (Bandura, 1997). This assertion has been tested regarding general preventive health behavior (Jayanti & Burns, 1998), behavior intention (Wulfert & Wan, 1995), and even communication to safeguard health (Hale & Trumbetta, 1996).

Jayanti and Burns (1998) discovered that higher perceptions of self-efficacy resulted in greater preventive health care behaviors such as eating a well-balanced diet, exercising, and avoiding smoking. Wulfert and Wan (1995) found support for the importance of self-efficacy as a mechanism of behavior change when self-efficacy was significantly related to college students' intentions to use condoms. Self-efficacy was the strongest predictor of routine exercise behavior among older adults, accounting for more variance in behavior than barriers, age, outcome expectancy, lifelong exercise patterns, and health status (Conn, 1998). Regarding women's health specifically, self-efficacy has been found to be influential in predicting a woman's likelihood of asking sexual partners about intravenous drug use history, homosexual involvements, as well as actual condom usage (Hale & Trumbetta, 1996). In a study conducted by Gonzalez (1990), perceived self-efficacy was strongly and positively related to the performance of BSE among Mexican American women.

Perceived self-efficacy receives attention from clinical researchers, yet it is usually studied as a correlate of behavior adaptation, and not as an outcome variable in itself. In lieu of focusing on behavioral outcomes, this study examines self-efficacy as the primary outcome of interest, filling a gap in health communication research. A review of the literature encompassing self-efficacy as a predictor of health outcomes demonstrates strong relationships among several explanatory variables. These include self-efficacy, knowledge, perceived social norms, and barriers to performance (see Bandura, 1997). The relationships between self-efficacy, knowledge, and perceived social norms are positive, each facilitating performance of a health practice, while the relationship of self-efficacy to a nonsupportive environment is negative.

Actual and Perceived Procedural Knowledge About Cancer Detection

Improving a target population's working knowledge and awareness of a health issue is one common goal for health communication researchers because the transfer of knowledge is an inherent strength of the communication process (Maibach & Cotton, 1995). Thus, knowledge of the problem of breast and cervical cancer and what one should do about it are essential precursors to effective cancer detection. Bandura argues that "what people need is knowledge about *how to* [italics added] regulate their behavior and firm belief in their personal efficacy to turn concerns into effective preventive actions" (Bandura, 1997, p. 280). Both actual procedural knowledge (the specific "how to" awareness) and perceived procedural knowledge (beliefs regarding one's understanding) were included in this study to explore their relationships to women's sense of self-efficacy in engaging in cancer detection practices.

Women's Perceived Social Norms Relating to Cancer Detection Practices

Another important mechanism for improving self-efficacy is the perceptions of other people's behavioral performances. Health messages can enhance perceptions of self-efficacy by communicating positive social norms and modeling successful demonstrations of health behaviors (Maibach & Cotton, 1995). When women perceive that others are successfully demonstrating health behaviors, their feelings of competence in that area are enhanced (Solberg, 1998). One group of 219 Dutch women was asked how many other women they knew who were participating in a local intervention featuring a free

breast cancer screening (Lechner, de Vries, & Offermans, 1997), with results showing that self-efficacy was directly related to the number of other women each participant perceived was obtaining a cancer screening. A study examining the practices of skin cancer prevention among Georgia farmers showed that the perceived involvement of family members as social resources "either vicariously through observation or directly through communication" (Parrott, Monahan, Ainsworth, & Steiner, 1998, p. 390) was directly related to their adaptation of healthy behavior (Parrott et al., 1998). Thus, even when direct observation of a health-related behavior is not normally possible (such as observing mammography), communication about these behaviors, and general perceptions about health-related practices of one's social network, can serve to promote the same health-related behavior in the observer

Barriers to Women's Performance of Breast and Cervical Cancer Detection Practices

Substantial changes in any health behavior are likely to be subject to attitudinal and structural barriers. A study by Conn (1998) found that older adults' self-efficacy regarding routine exercise was strongly and negatively correlated with the number of barriers they perceived. Barriers to exercise were also significantly related with actual exercise behavior and health status. Although the availability of money and time are obvious influences on behaviors such as obtaining regular cancer screening tests, physical and social uneasiness such as discomfort and embarrassment can also affect the performance of these types of behaviors.

In sum, self-efficacy is a critical outcome associated with the performance of health prevention and detection practices and predicted by several variables, including actual and perceived procedural knowledge, peer and perceived family norms, referral to professionals, and barriers such as cost, comfort, embarrassment, and time.

H1: Women's (a) actual procedural knowledge and (b) perceived procedural knowledge are positively correlated with women's perceived self-efficacy regarding the performance of breast and cancer detection practices.

H2: Women's perceived social norms in the form of (a) perceived peer norms, (b) perceived family norms, and (c) referral to professionals is positively correlated with women's perceived self-efficacy regarding the performance of breast and cervical cancer detection practices.

H3: Barriers to cancer detection, including (a) cost, (b) comfort, (c) embarrassment, and (d) time, are negatively correlated with women's perceived self-efficacy regarding breast and cervical cancer detection practices.

Method

Participants

The participants for this study (N = 206) were recruited via a larger, omnibus study concerning male farmers' skin cancer prevention. A random sample of farmers (N = 448) from eight rural counties in the southeastern United States participated in a survey that included an item about their marital status (see Parrott et al., 1998). The wives of these 404 married farmers received a mail survey that addressed issues regarding cancer prevention and detection practices. Following a two-week reminder postcard and four-week follow-up phone call, a total of 206 surveys were returned, resulting in a 51%

response rate. The sample was composed of rural Caucasian women with an average age of 48 (*SD* = 11.79). Nearly half of the women (42.6%) reported that farming made up 75% or more of their incomes, and about one third of the participants (36.4%) operated their own farms. Respondents reportedly traveled an average of 24.78 miles (*SD* = 22.48) miles to obtain a medical check-up.

Instrumentation

Items used for this analysis were developed after conducting interviews with farm wives about perceived barriers to cancer prevention and detection. Information concerning a pilot test conducted with the sample used in this study can be found in Parrott, Steiner, and Goldenhar (1996).

Self-Efficacy

The dependent variable in this study was perceived self-efficacy regarding the use of breast and cervical cancer detection methods. Maibach and Murphy (1995) assert in their overview of the construct that there are no standard sets of self-efficacy measures that apply to all people in all situations: Self-efficacy scales must be tailored to specific domains of functioning. Therefore, to tailor this scale to women's use of breast and cervical cancer detection practices, each measurement item referred directly to women's feelings of self-efficacy regarding the use of BSE, clinical breast exams, mammograms, or pap tests. The women were asked to respond to the items by selecting one of five Likert-scale responses. To determine if the 10 items represented unique dimensions related to women's self-efficacy, the 10 items were submitted to exploratory factor analysis using principal-axis factoring (PAF). PAF is the most common and appropriate method for use with exploratory factor analysis (Benson & Nasser, 1998). The results showed three distinct factors, accounting for 76% of the variance. Evidence for a three-factor solution included the presence of three eigenvalues greater than one, and the visual screen procedure confirmed that three factors should be extracted for analysis. A three-factor orthogonal Varimax rotation of these 10 items determined which items loaded onto each of the three distinct factors. For the self-efficacy items, as well as for all factor analyses in this project, the decision rule for item retention was that an item with a loading of at least .30 or above on one factor and less than .30 on the other two factors would be retained and associated with the factor to which it loaded the highest.

The first dimension of self-efficacy included questions about a woman's *confidence in her ability to follow through*: "How certain are you that you could find a medical doctor/nurse to (a) conduct breast examinations, (b) conduct pap tests, (c) conduct mammograms?" and "How certain are you that you can remember to conduct monthly breast self-examinations?" In response to each of these questions, the women were asked to circle a number from 1 to 5, where 1 = very uncertain, and 5 = very certain. For confidence in ability to follow through, Cronbach's alpha was .95. The items composing the second dimension of self-efficacy, *perceived difficulty* of cancer detection practices, were: "How difficult is (a) conducting a breast self-examination, (b) getting an annual clinical breast examination, (c) getting an annual mammogram, and (d) getting an annual pap test?" For each item, respondents used response options where 1 = very difficult, and 5 = very easy. For the difficulty scale, Cronbach's alpha was .75. The third self-efficacy factor was related to women's *confidence in their ability to perform BSE* (Cronbach's alpha = .70). This factor was composed of two items: "How certain are you that you could recognize unhealthy changes in your breast?" and "How certain are you that you

could find a medical doctor/nurse to help you learn to conduct breast self-examinations?'' The response options for the items in this scale ranged from 1 = very uncertain to 5 = very certain.

Actual Procedural Knowledge

Specific procedural questions pertaining to breast and cervical cancer detection were presented to the respondents in a multiple-choice format, each with four possible responses, including one correct response and three incorrect responses. A summative scale of the number of correct responses was computed to determine each participant's actual procedural knowledge score on a scale from 0 to 7. The survey items included: (a) How often should you get a mammogram to help detect breast cancer? (b) If you feel a lump in your breast, when should you see a doctor/nurse? (c) How often should you conduct an exam of your own breasts to help detect breast cancer? (d) When performing a breast self-exam, which areas of the breast should you check? (e) What should a woman do to prepare for getting a pap test? (f) How often should you get a clinical pap test? (g) Should a woman douche, avoid intercourse, or be on her period before getting a pap test?

Perceived Procedural Knowledge

Participants were asked the following: ''How knowledgeable are you about: (a) breast self-exams, (b) clinical breast exams, (c) mammograms, (d) pap tests, (e) breast cancer, and (f) cervical cancer'' (Cronbach's alpha = .89). For these items, participants were asked to select from five responses: 1 = know nothing at all, 2 = not very knowledgeable, 3 = somewhat knowledgeable, 4 = very knowledgeable, and 5 = know all there is to know.

Perceived Social Norms

The perceived social norms measure was constructed to represent how individuals perceive their social networks as sources for health-related information, as well as to tap the perceptions of the normative behavior present among groups of friends and family. Participants responded to each of 11 questions using 5-point scales to indicate the frequency of occurrence (1 = never, 2 = seldom, 3 = sometimes, 4 = frequently, 5 = always). Exploratory factor analysis procedures using PAF and orthogonal Varimax rotation resulted in three factors accounting for 74.8% of the variance: perceived peer norms, perceived family norms, and referral to professionals.

One factor was named ''referral to professionals,'' and included the following three items: ''How often have you asked someone to help you find a health care professional to: (a) examine your breasts for signs of cancer, (b) get a mammogram to detect breast cancer, and (c) get a pap test'' (Cronbach's alpha = .74). A second factor, ''perceived family norms,'' included four items: ''How often do other women in your family (a) conduct breast self-exams, (b) receive clinical breast exams, (c) receive mammograms, and (d) receive clinical pap tests'' (Cronbach's alpha = .89). The third factor, ''perceived peer norms,'' was assessed using four items as well: ''How often do other farm wives in your area (a) conduct breast self-exams, (b) receive clinical breast exams, (c) receive mammograms, and (d) receive clinical pap tests'' (Cronbach's alpha = .89).

Barriers

To measure perceived barriers to engaging in cancer detection practices, women responded to 17 statements using 5-point scales ranging from 1 = strongly disagree to 5 = strongly agree. PAF and the visual scree method extracted four factors that accounted for 75.3% of the variance among the items.

One factor labeled ''discomfort'' included six Likert scales (1 = strongly disagree, 2 = disagree, 3 = neither, 4 = agree, 5 = strongly agree; Cronbach's alpha = .82): (a) Conducting a breast self-exam is physically uncomfortable, (b) getting a clinical breast exam causes physical discomfort, (c) getting a pap test causes physical discomfort, (d) getting a mammogram causes physical discomfort, (e) getting a mammogram causes me to bruise, and (f) getting a pap test causes me to bleed. A second factor, the barrier of ''cost,'' included three items (Cronbach's alpha = .95): (a) Getting a clinical breast exam costs too much, (b) getting a pap test costs too much, and (c) getting a mammogram costs too much. A third factor, ''embarrassment,'' included four items, each with 5-point Likert responses where 1 = very unlikely and 5 = very likely (Cronbach's alpha = .94): (a) Would you feel embarrassed to conduct a monthly breast self-examination? (b) Would you feel embarrassed to get a yearly clinical breast exam? (c) Would you feel embarrassed to get a yearly mammogram? and (d) Would you feel embarrassed to get a yearly pap test? The fourth barrier, ''time,'' included four items and 5-point scales with 1 = strongly disagree and 5 = strongly agree (Cronbach's alpha = .93): (a) Conducting a monthly breast self-exam takes too much time; (b) getting a clinical breast exam takes too much time; (c) getting a pap test takes too much time; and (d) getting a clinical breast exam takes too much time.

Results

To evaluate the three hypotheses, data from 206 farm wife surveys were analyzed, with scatterplots of the original raw data points examined for possible outliers. The data contained no problems regarding significant outliers and collinearity. Pearson product moment correlations are reported in Table 1 with means and standard deviations for the measures reported on the diagonal. With regard to the dependent variables (women's perceived self-efficacy related to performing cancer detection practices). The descriptive statistics reveal that the participants were, on the average (M = 4.67), very confident about their ability to follow through with breast and cervical cancer detection methods, and somewhat less confident, on average (M = 3.99), about their skills relating to BSE. Women's perceptions of the difficulty associated with cancer detection practices suggests, on average (M = 3.45), that practicing cancer detection methods remains somewhat challenging. These three dimensions of self-efficacy are positively related to one another, suggesting that to enhance one will facilitate another, although only modestly.

Women perceived themselves to be only moderately knowledgeable (M = 3.32) about cancer detection, although the scores, on average, for actual knowledge were quite high (M = 5.79). Women reported that both perceived peer norms (M = 3.50) and perceived family norms (M = 3.66) were moderately influential regarding their cancer detection practices. The perception of social influence through the women's own interactions in seeking referral to professionals, however, is reported to occur less often (M = 1.73). With regard to barriers, these rural women, on average, were somewhat uncertain regarding how much cost (M = 2.60) or comfort (M = 2.46) entered into decision making about performance of breast and cervical cancer detection practices. Women generally disagreed that embarrassment (M = 1.78) or time (M = 1.96) inhibited performance of these potentially life-saving measures. Yet a different story emerges as one considers the relationships among these variables. For example, although women tend to disagree that time is a barrier, the more time is perceived to be a barrier, the less confidence women have in their ability to follow through, the more difficult these practices appear, and less they perceived their ability to perform BSE.

TABLE 1 Bivariate Pearson Product Correlation Coefficients

Subscale**	1	2	3	4	5	6	7	8	9	10	11	12
1. SE1 (Follow-through)	4.67 (.52)	.34*	.44*	.34*	.23*	.23*	.20*	**.11**	- .21*	- .13*	- .37*	- .41*
2. SE2 (Difficulty)		3.45 (.98)	.34*	.47*	**.07**	.20*	.34*	.21*	- .28*	- .21*	- .27*	- .35*
3. SE3 (BSE skills)			3.99 (.65)	.50*	.26*	.24*	.40*	.25*	- .32*	- .25*	- .37*	.52*
4. Perceived knowledge				3.32 (.65)	.22*	.21*	.37*	.27*	- .22*	- .21*	- .35*	- .41*
5. Actual knowledge					5.79 (1.16)	.15*	.22*	**.03**	– **.11**	– **.10**	- .16*	- .24*
6. Perceived peer norms						3.50 (.63)	.53*	.20*	- .19*	– **.10**	– **.08**	- .26*
7. Perceived family norms							3.66 (.96)	.29*	- .15*	- .22*	- .13*	- .29*
8. Referral to professionals								1.73 (.92)	- .22*	.22*	– **.10**	- .20*
9. Cost (barrier)									2.61 (1.10)	.33*	.29*	.51*
10. Comfort (barrier)										2.46 (.70)	.26*	.32*
11. Embarrassment (barrier)											1.78 (.91)	.49*
12. Time (barrier)												1.96 (.70)

*$p < .05$; boldface type indicates nonsignificant correlations.
**All measures used 1–5 scales except actual knowledge, with a possible 0–7.

Hypothesis One

The first hypothesis, which predicted that women's actual and perceived procedural knowledge would be positively correlated with perceived self-efficacy, was largely supported. Actual knowledge emerged as directly relating to two dimensions of self-efficacy (confidence to follow through and confidence in ability to perform BSE), but showed no relationship to women's perceptions of the difficulty associated with breast and cervical cancer practices. Perceived knowledge was positively correlated with all three dimensions of self-efficacy.

Hypothesis Two

The second hypothesis, predicting that perceived social norms were positively correlated with perceived self-efficacy, was also largely supported, as positive correlations ranging from $R^2 = .20$ for perceived peer norms' influence on perceptions of difficulty and perceived family norms' influence on confidence in ability to follow through to $R^2 = .40$ for perceived family norms' influence on confidence to perform BSE were obtained. The only nonsignificant relationship was the correlation between referral to professionals and women's confidence in their ability to follow through.

Hypothesis Three

The third hypothesis, which predicted that barriers to cancer detection practices would be negatively related with perceived self-efficacy, was supported with negative correlations ranging from $R^2 = -.13$ for the comfort barrier on confidence to follow through (e.g., if it didn't hurt so much, maybe I would remember to do it more often) to $R^2 = -.52$ for the time barrier on confidence in having the skills to perform BSE.

Hierarchical regression models were used to compare the ability of the independent variables to predict each of the three factors related to women's perceived self-efficacy in performing breast and cervical cancer detection practices. Step 1 or Block 1 in the regression equation included the two knowledge subscales: perceived knowledge and actual knowledge. Step 2 included the three perceived social norms subscales: perceived peer norms, perceived family norms, and referral to professionals. Finally, the four barrier subscales were entered: cost, comfort, embarrassment, and time. For each of the three dimensions of self-efficacy, the individual beta weight for each independent variable subscale was used to determine if the variable was a significant predictor of perceived self-efficacy (see Table 2). For each of the three blocks of independent variables, only a few subscales significantly predicted self-efficacy when all of the other eight predictors were controlled, although the combination of variables representing a construct contributed significantly to the variance accounted for when individual subscales were not significantly predictive.

Regarding women's confidence in their ability to follow through, the results of the multiple regression analysis showed that in Step 1 the overall knowledge construct accounted for 12% of the variance, but neither actual knowledge ($\beta = .10$; $p > .05$) nor perceived knowledge ($\beta = .14$; $p > .05$) contributed significantly on its own when controlling for the influence of the other predictors in the regression equation. Perceived social norms accounted for 2% in additional variance ($F_{(5,192)} = 7.55$; $p < .001$); the perceived peer norms variable in particular is significant ($\beta = .16$; $p < .05$) with regard to perceptions of confidence in their ability to follow through and take action, therefore making a significant independent contribution to women's perceived self-efficacy. The entry of the barriers subscales explains an additional 12% of the variance in women's perceptions of confidence associated with follow through ($F_{(9,188)} = 7.26$; $p < .001$). In this case, perceptions of embarrassment ($\beta = -.20$; $p < .05$) and time ($\beta = -.23$; $p < .05$)

TABLE 2 Effects of Independent Variables on Women's Confidence in the Ability to Follow Through

Variable	β	R	Adj. R^2	F
Step 1				
Knowledge		.37	.12	15.17***
Perceived knowledge	.14			
Actual knowledge	.10			
Step 2				
Perceived social norms		.41	.14	7.55***
Perceived peer norms	.16*			
Perceived family norms	- .02			
Referral to professionals	- .02			
Step 3				
Barriers		.50	.26	7.26***
Cost	.02			
Comfort	.03			
Embarrassment	- .20*			
Time	- .23**			

*$p < .05$, **$p < .01$, ***$p < .001$.

relating to cancer detection practices make separate significant contributions to the regression equation (see Table 2).

For the second dimension of women's perceived self-efficacy, perceived difficulty in performing breast and cervical cancer detection practices, the variables were entered in the same order, with the knowledge construct entered first. Knowledge accounted for 22% of the variance in perceived difficulty ($F_{(2,195)} = 29.46$; $p < .001$), with the actual knowledge subscale not being a significant independent contributor ($\beta = -.09$; $p > .05$). Perceived knowledge, on the other hand, was a significant predictor of perceived difficulty ($\beta = .34$; $p < .001$). The perceived social norms subscales accounted for an additional 3% of the variance ($F_{(5,192)} = 14.20$; $p < .001$), but only the subscale related to women's perceived family norms demonstrated an independent contribution to this dimension of self-efficacy ($\beta = .18$; $p < .05$). Regarding barriers to cancer detection practices, the four subscales together accounted for an additional 3% of the variance, but none of the individual constructs provided significant independent predictors of perceived difficulty of cancer detection (see Table 3).

For women's confidence in their skills to perform BSE, knowledge accounted for 26% of the variance ($F_{(2,195)} = 36.25$; $p < .001$), and although actual knowledge was not a significant independent predictor ($\beta = .08$; $p > .05$), perceived knowledge did significantly predict confidence in skills related to BSE ($\beta = .24$; $p < .001$). Perceived social norms provided an additional 5% of the variance in this dimension of self-efficacy ($F_{(5,192)} = 19.12$; $p < .001$), with perceived family norms being the only significant individual predictor ($\beta = .20$; $p < .01$). Finally, the barriers construct accounted for an additional 8% of the variance in women's confidence related to skills in performing BSE ($F_{(9,188)} = 15.28$; $p < .001$). Two barriers were individually significant predictors of this dimension of self-efficacy when the effects of the other predictors were controlled: embarrassment ($\beta = -.10$; $p < .05$) and time ($\beta = -.25$; $p < .01$). (See Table 4.)

TABLE 3 Effects of Independent Variables on Women's Perceptions of Difficulty with Performing Cancer Detection Practices

Variable	β	R	Adj. R^2F
Step 1			
Knowledge	.48	.22	29.46***
Perceived knowledge	.34***		
Actual knowledge	- .09		
Step 2			
Perceived social norms	.52	.25	14.20***
Perceived peer norms	- .19		
Perceived family norms	.18*		
Referral to professionals	.04		
Step 3			
Barriers	.55	.28	9.32***
Cost	- .11		
Comfort	- .01		
Embarrassment	- .06		
Time	- .11		

*$p < .05$, **$p < .01$, ***$p < .001$.

TABLE 4 Effects of Independent Variables on Women's Confidence in Skills to Perform BSE

Variable	β	R	Adj. R^2F
Step 1			
Knowledge	.52	.26	36.25***
Perceived knowledge	.24***		
Actual knowledge	.08		
Step 2			
Perceived social norms	.57	.31	19.12***
Perceived peer norms	<- .01		
Perceived family norms	.20**		
Referral to professionals	.07		
Step 3			
Barriers	.64	.39	15.28***
Cost	- .06		
Comfort	<- .01		
Embarrassment	- .10*		
Time	- .25*		

*$p < .05$, **$p < .01$, ***$p < .001$.

Discussion

Self-efficacy is a multifaceted phenomenon influenced differentially according to the dimension of self-efficacy one is addressing. In this study, rural farm women perceive themselves better able to follow through with prescribed cancer detection practices when they observed peers doing so. Feelings of embarrassment associated with the practices inhibit follow-through, as do perceptions of time constraints. Rural women's self-efficacy perceptions associated with the difficulty of performing cancer detection practices are strongly influenced by perceived knowledge. Thus, the more a woman believes she understands cancer detection practices, the easier she believes their performance to be. Perceived family norms also facilitate these perceptions, contributing to a sense that these practices just are not that difficult to do. Finally, belief in one's skills associated with the performance of BSE was enhanced by belief in one's knowledge levels and the availability of perceived family norms. Inhibiting one's confidence in personal skills were time and embarrassment.

If health communicators are to benefit from understanding that self-efficacy affects health outcomes, strategies to design messages addressing self-efficacy must be ascertained. Recall that the effective use of fear appeals depends upon reference to self-efficacy (Witte, 1992). A clear lesson regarding the self-efficacy construct emerged from this project: self-efficacy is domain specific and multifaceted. Just as efforts in communication to enhance a speaker's credibility depend both on who the speaker is and, at minimum, perceptions of competence and character, efforts in communication to enhance perceptions of self-efficacy depend upon what the specific topic is, and, at minimum, perceptions of confidence in one's skills to perform a task, as well as one's ability to marshal requisite cognitive and environmental resources to follow through on such skills. Hence, health communicators are reminded once more that the perceived limits of one's personal control over the environment form boundary conditions for one's thoughts and actions. To the extent that rural women lack confidence in their ability to access providers or remember to perform BSE, they lack self-efficacy with regard to performing cancer detection practices.

Health communication specialists have determined that perceived self-efficacy is a critical component of successful behavior change, yet few health communication campaigns have capitalized on this construct by making it the focus of health promotion messages. The secondary goal of this project was to facilitate the implementation of health communication campaigns related to women's self-efficacy in performing breast and cervical cancer detection practices. To this end, three specific suggestions are offered for designers of health communication campaigns based on the results of this study.

Make Direct Reference to Cancer Detection Practice Barriers

First, the data show that perceived barriers are a strong influence in rural women's self-efficacy related to cancer detection. More specifically, two barriers to cancer detection (fear of embarrassment and lack of time) were found to be significant predictors of two dimensions of self-efficacy (rural women's confidence in their ability to follow through and rural women's confidence in their skills to perform). Recall that Bandura's conception of self-efficacy includes the idea that self-efficacy involves coordinating behavior with ever-changing circumstances. For example, as time constraints fluctuate, prioritizing time for a mammogram or a pap test in the face of work or family obligations can be a powerful deterrent from engaging in these types of health behaviors. The results of this

study show that these issues related to time and embarrassment need to be specifically addressed in health communication campaigns promoting women's self-efficacy. An example of this type of message might be, "A little time invested to get a mammogram now may save time later if you avoid illness or disease." This approach may be particularly important when the distance one must travel to receive these exams requires a greater expense of time, as is the case with these rural farm women. This type of approach targets one of the most powerful obstacles to self-efficacy, ultimately improving rates of detection practices for breast and cervical cancer.

Support the Target Population's Perceived Knowledge

Second, designers of health messages should also take note of the fact that, in this current study, the variable of perceived knowledge, and not actual knowledge, was found to be a significant predictor of self-efficacy. This finding lends further support to the idea that knowledge about how to accomplish a behavioral objective is a necessary but not sufficient condition for successful enactment of the behavior. Other studies have also confirmed the fact that knowledge holds little explanatory power as compared with other predictors of health behavior. For example, Hale and Trumbetta (1996) underlined the relative importance of self-efficacy over knowledge when they found that knowledge did not significantly predict women's behavioral risk regarding sexually transmitted diseases.

Although these results do not mean that efforts at health education are not an important component of many health communication interventions, they do suggest that the target population must be persuaded that they know what to do and why to do it. Health communication campaigners should consider the impact of messages such as "You've heard the stories about how early detection saves lives. . . . The question is, what will you do about it?" and "You're a woman who knows what it takes to keep your family healthy. So why not do the same for yourself? Schedule a mammogram today." Emphasizing the existing skills and positive characteristics of the population will enhance self-efficacy as well as tap into the importance of perceived knowledge.

Involve the Social Network

Finally, the importance of family in health issues such as breast and cervical cancer detection practices cannot be discounted. Results from this project showed that when women perceived that other women in their family were engaging in regular detection practices, the perceived difficulty in performing cancer detection practices was diminished, and the women's confidence in their skills related to BSE was enhanced. This finding is not surprising considering the fact that Bandura's social cognitive theory emphasizes the power of vicarious experience on self-efficacy and performance (Bandura, 1986). Many women consider their family to be their most important source of social comparison, both developmentally and relationally. This network of family processes is an antecedent for self-efficacy (Solberg, 1998). Designers of health communication campaigns can capitalize on the impact that family networks have on cancer screening rates by developing messages aimed specifically at the family members of the target population. For example, these types of messages can be aimed at men: "How long has it been since you've encouraged your wife to have a mammogram?" or aimed at women for the purpose of enhancing cancer detection rates among family members: "Set the stage for health promotion in your family: Get a yearly pap test and remind the other women in your family to do so, too."

Limitations and Directions for Future Research

One limitation of this study is its cross-sectional, rather than longitudinal, design, which featured a single measurement point. Future research that allows for the testing of successive changes in behavior and self-efficacy will be useful in illustrating these explanatory effects and the importance communication has on them. In addition, future projects should endeavor to collect measurable behavioral outcomes in addition to self-report data.

Although the findings reported here should be used with some caution when generalizing to populations of women who differ from this sample of White rural women, the sample bears some similarities to other underserved populations of women in the United States. For example, African American women in a metropolitan community were more likely to recognize barriers to obtaining a mammogram (such as convenience and cost) than were European American women in the same community (Miller & Champion, 1997). The importance of perceived family norms that was reported by this sample of farm women may be even more important to other groups of women: for instance, women of Vietnamese or Japanese descent often rely on family relationships exclusively for reference and assistance in health matters (Long, 1993; Yi, 1994). Thus, although future research that aims to replicate this type of study with other populations of women will be most helpful, these results can be cautiously interpreted in light of some of the similarities this group shares with other underserved populations of women.

The most important direction for future research based on this project is to continue to test how self-efficacy can be used to predict and improve health behaviors such as performing breast and cervical cancer detection practices. Health communication campaigns that capitalize on the construct of perceived self-efficacy should be designed and implemented to determine its practical worth. In doing so, message designers should consider the results of this study, which suggest that special consideration be paid to addressing the barriers of embarrassment and time, as well as the variables of perceived knowledge and women's perceived family norms.

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