

Promoting a cancer screening program to Hmong women in Minnesota:
The role of source matching and acculturation

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Dedication

This thesis is dedicated to...

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Abstract

The present research assesses the effect of source matching and level of acculturation on Hmong women's interest in a free cancer screening program, their intended behavior to both share the message and call the program, as well as their evaluation of the message. Results show few significant main effects and no moderation effects. Results are discussed, problems are addressed, and future directions to encourage cancer screening in the Hmong population are recommended.

Table of Contents

| | |
|--|----|
| Chapter One: Introduction | 1 |
| Chapter Two: Literature Review | 4 |
| Hmong population in Minnesota | 4 |
| Health issue: breast and cervical cancer in the Hmong population | 10 |
| Acculturation: definition and theory | 14 |
| Considerations for working with a refugee population | 17 |
| Site for intervention | 20 |
| Theoretical justification for message design | 22 |
| Chapter Three: Methodology | 34 |
| Participants | 34 |
| Measures | 35 |
| Materials and dissemination | 38 |
| Chapter Four: Results | 43 |
| Main effects | 43 |
| Moderation | 45 |
| Chapter Five: Discussion | 47 |
| Limitations | 50 |
| Future directions | 53 |
| Bibliography | 61 |
| Appendix A: Survey Instrument | 84 |
| Appendix B: Direct Mail Materials | 94 |
| Appendix C: Descriptive Statistics | 98 |

Chapter One: Introduction

The aim of the present research is to take a formative step in recruiting a minority refugee population into a free cancer screening program primarily using print materials, disseminated by community health representatives. As a refugee population of 40 to 80 thousand (U.S. Census Bureau, 2000; Xiong, 2010) in the metro area of Minneapolis – Saint Paul, Minnesota, the Hmong people are a community of disparity. They tend to have large households with low incomes and literacy (U.S. Census Bureau, 2010; Wilder Research Center, 2000) and, having very different religious and health beliefs (Sperstad & Werner, 2005), are often misunderstood by both Western health practitioners and public health campaign designers. The present research attempts to use social, communication, and acculturation theories to adapt print materials, previously proven effective at the chosen site for intervention, to this special population.

Past research has proven the effectiveness and encouraged the use of screening for breast and cervical cancer (U.S. Preventive Services Task Force, 2003; U.S. Preventive Services Task Force, 2009), yet cancer screening services are underutilized in the Hmong population (Yang, Mills, & Dodge, 2006). Cervical cancer specifically, is considered very preventable (Kagawa-Singer, Tanjasiri, Valdez, Yu, & Fu, 2009), yet there is an incredibly high incidence of late stage cervical cancer in the Hmong population, which leads to higher mortality rate from the disease (Mills, Yang, & Riordan, 2005; Yang, Mills, & Riordan, 2004).

While there is a plethora of information on the Hmong culture and their religious and health beliefs (Johnson, 2002; Parker & Kiatoukaysy, 1999; Sperstad & Werner, 2005), little is known on the level of acculturation of this campaign's target audience, Hmong women age 40-65. Moreover, we do not know the effect that acculturation, as well as a similar or non-similar source would have on their reception of the message and resulting attitudes and behavioral intention.

When targeting refugee populations with a public health campaign, there are several considerations to take. First, their access to healthcare challenges are many-fold. For some, insurance or low-income is an issue (Quincy, 1995). For others, there is a tremendous language barrier. In the Hmong population specifically, as is consistent with other Asian cultures, there tends to be a focus on acute care. Preventive care is not considered a priority. Culture, specifically religious beliefs, seem to be the largest obstacle to either overcome or work with to improve breast and cervical cancer screening rates in the Hmong population.

The site for intervention, the Minnesota Department of Health's Sage Screening Program, helps to decrease disparities in cancer screening rates and diagnoses by providing free breast and cervical cancer screening services to eligible women (Minnesota Department of Health, 2009). While the Sage Screening Program, hereafter referred to as Sage, has successfully reached several minorities in the state, there has been no specific effort to recruit Hmong women (S. Hollie, personal communication, October 19, 2009).

The materials for the present intervention are an example of what Rimer and Kreuter (2006) have dubbed tailored health communication. The message is presented as a loss framed photo, deemed appropriate for a largely illiterate population. The Elaboration Likelihood Model (Petty & Cacioppo, 1981) and Witte's (1992) Extended Parallel Process Model were considered in design, and the Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) and Social Cognitive Theory (Bandura, 1977, 1986) are used to help explain message effects.

Chapter Two: Literature Review

Hmong population in Minnesota

From the mountains of Southeast Asia to the United States

The worldwide population of Hmong is estimated at about 7.5 million, with approximately 6 million living in China, 788 thousand in Vietnam, 315 thousand in Laos, 250 thousand in the United States, and 124 thousand in Thailand (Culhane-Pera, Vawter, Xiong, Babbitt, & Solberg, 2003). The Hmong began arriving to the US from Laos and Thailand in late 1975 due to the Communist takeover of those countries, with refugee arrivals peaking at 27,000 in 1980. Current estimates are that about 26 percent of US - living Hmong arrived between 1985 and 1989, and 28 percent arrived between 1990 and 1994 (Ehret, 2001).

Most refugees from Southeast Asia to the US settled along the coasts and in Minnesota and Wisconsin, largely as a result of church-sponsored programs (U.S. Department of Health and Human Services Division of Economic Support, 1994). Southeast Asians make up one of the largest groups of refugees to resettle in the US in the last thirty years and the Hmong make up a significant part of this group (Goodkind, 2005). The 1990 U.S. Census counted 94,439 Hmong; the 2000 Census counted 186,310 – a 97 percent increase in the course of a decade. This number is continually increasing.

Hmong population in Minnesota

According to the 2000 U.S. Census, California has the largest population of Hmong in the country with 65 thousand, followed by Minnesota with 42 thousand and Wisconsin with 34 thousand. These are still believed to be underestimates due to Hmong resistance to filling out census forms (Ehret, 2001). Community estimates claim that Minnesota is home to approximately 80 thousand Hmong, and in the last ten years has surpassed California for housing the largest Hmong population in the country (Xiong, 2010). The number of Hmong refugees in Minnesota peaked in the early 1980s, primarily from refugee camps in Thailand (Ehret, 2001). Minnesota has historically always housed one of the US's largest Hmong populations and the Hmong make up the largest single Asian group in Minnesota, with over half residing in Saint Paul (U.S. Census Bureau, 2000).

Nationwide Hmong demographic characteristics

Household size and makeup for Hmong families in the US differs considerably from the average American family. The typical Hmong family in the US is 6.51 persons, while the typical family in the US is 3.14 persons. The average Hmong household is made of 6.28 persons, compared to 2.59 persons overall in U.S. households. Hmong typically get married early, start a family at a young age and have a large family (Podhisita, Kunstadter, & Kunstadter, 1990). Hmong in the US generally have a low socioeconomic status, due to their recent immigration (U.S. Census Bureau, 2000). There

is a 38% poverty rate among Hmong, with a per capita income of \$6,613 and a median household income of \$32,224 (U.S. Census Bureau, 2000).

Hmong values and beliefs

The Hmong have a belief system not too dissimilar from many other Asian societies. While Western society is centered on individualism, the Hmong community focuses on family and community (Andrews & Boyle, 2003). Traditionally, the Hmong society is patriarchal and men have a higher status than women. Hmong society is patrilineal, recognizing eighteen clans. Within each clan, there is a hierarchy of males responsible for making decisions regarding social, political, financial, even health problems, with the oldest male family member making the final decision in consultation with other male clan members. Elders are very respected members of Hmong society (Parker & Kiatoukasy, 1999).

Hmong religious and health beliefs

In the Hmong population, religious beliefs and health beliefs tend to be intertwined. Traditional Hmong believe in animism; that the physical and spiritual worlds coexist. As Yang (2010) discussed, a person has several spirits and three main souls. If the soul is not near the body, a person can get sick. One could, for example, lose a soul while they're lying on the operating table or a soul may get scared away if its person is involved in a car accident.

The concept of illness in the Hmong culture and the Western world also differs greatly. Whereas most Americans would blame an illness on germs, genes, or an environmental factor (biomedical causes), Hmong believe that an illness may be brought on by a curse, a lost soul or spirit, or an imbalance of natural and bodily forces (Sperstad & Werner, 2005). Traditional Hmong health beliefs hold that an illness is caused by either natural, supernatural, social or personal causes (Sperstad & Werner, 2005).

While Western medicine has recently begun to embrace therapeutic treatments for illness like herbal remedies and acupuncture, medication and surgery are still the norm for American doctors treating a patient. In contrast, the Hmong tend to turn first to traditional therapeutic practices such as home therapies, herbal medicine, ritual or magical healers, soul callers and shaman (Sperstad & Werner, 2005).

Barriers to Western medicine for Hmong

The two greatest barriers for Hmong people seeking help in Western medicine are language and knowledge. While medical interpreters are being used in doctors' offices now more than the patients' bilingual children, translation is still difficult (Thao, 2010). Hmong refugees are often unaware that certain body parts exist or perform certain functions.

Hmong language lacks words for most Western medical and anatomical terms (Johnson, 2002). Specifically as it pertains to this experiment, the words cancer, mammogram, Pap test, and x-ray simply do not exist in the Hmong language. As a result, many words and phrases are used to describe what Americans easily recognize. In

explaining what a mammogram is and why it is important, for example, one has to find a phrase to use in place of “mammogram,” such as “photo of the breast,” since “x-ray” is not a salient term in Hmong. One then has to explain the physical procedure and, furthermore, its preventive nature for breast cancer. “Cancer,” then, has to be operationalized. From a health message design perspective, a simple “Get a mammogram” message becomes a paragraph long descriptive narrative, detailing the how and why of mammograms.

There are several medical practices that strongly conflict with Hmong health beliefs. As a result of abuse in refugee camps, Hmong women tend to be extremely modest. A commonplace physical exam, much less a disconcerting gynecological exam, can cause a woman to be psychologically distressed. Surgery is another issue in Hmong culture. A loss of body parts may affect reincarnation, and having the body open on the operating table may allow evil spirits to enter.

The aforementioned value conflicts between Hmong values and Western health care providers can be detrimental to the entire Hmong community. Health professionals need to understand the Hmong culture and belief system in order to best help them. Establishing cultural awareness is an essential first step toward cultural competence (Spersted & Werner, 2005). Numerous books and articles have been published about these culture clashes. Notably, Fadiman’s (1997) The Spirit Catches You and You Fall Down, about a Hmong family with a daughter who is epileptic, and their interactions with the Western health care system, as well as several case studies on pregnancy-related topics (see Foss, 2001; Rice, 1999; Spersted & Werner, 2005).

As any immigrant or refugee population, the Hmong population in the US has faced numerous challenges. Gender roles are challenged as women have opportunities to work outside the home. Adults who are not fluent in English are embarrassed because they struggle to find employment and financially support their family.

Hmong literacy

New Hmong refugees typically arrive in the US with limited English speaking abilities, much less literacy skills. Having come from situations where societal structures were constantly interrupted by conflict and war, educational opportunities were limited and oral traditions dominated (Allen, Matthew and Boland, 2004). In a 2000 report by the Wilder Research Center, 77% of adult Hmong participants in the Twin Cities said they either speak no English or just a little bit. However, increasingly, American-born Hmong are becoming more fluent in speaking English than Hmong, and many children born into Hmong families are growing up bilingual (Owens, 2007).

Hmong health literacy

Health literacy is a topic of utmost importance when discussing a message strategy to reach Hmong women. Hmong as a language lacks terms that translate biomedical body physiology and anatomy (Johnson, 2002). Thus, the extensive use of non-direct terms is often needed to help Hmong understand a diagnosis or medical procedure. Couple this language barrier with differing medical beliefs and it is easy to see why Hmong have a lack of understanding of healthcare in general, and medical procedures specifically. Beyond the simple fact that there is no Hmong equivalent of the

English word “cancer,” Johnson (2002) found that many Hmong simply cannot comprehend the concept of chronic disease. As one focus group participant noted (p. 128) “In Laos, you got sick and you either got better or you died.” Thus, the idea of screening for breast or cervical cancer, with hopes to catch cancer early when it is more treatable, simply is not salient.

Health issue: breast and cervical cancer in the Hmong population

Regular screening for breast and cervical cancer has greatly decreased the burden these cancers have on women in the US. In the 1970s, for example, more than 75% of all cervical cancers diagnosed in the US were discovered at invasive stages. In recent years, thanks mostly to the recently discovered and popularized Pap test, about 75-85% of all cervical cancer cases are detected at the early (treatable) in situ stage, greatly decreasing its mortality rate (Kawaga-Singer, Tanjasiri, Valdez, Yu, & Foo, 2009). Similarly, mammography has been shown to be the most effective early breast cancer detection tool available (Whitman et al., 1991), and finding breast cancer in its early stages can greatly reduce mortality (Breen & Kessler, 1994).

Incidence of breast and cervical cancer in the Hmong population

As Breen and colleagues (2001) note, those least likely to get mammograms or Pap tests tend to be poor, older, and rural residents and those who lack a regular healthcare provider. There has been some success, however, in targeting other Asian subgroups to promote cervical cancer screening.

Vietnamese women have the highest incidence of cervical cancer of any racial ethnic group in the US (Miller et al., 1996). To address this, researchers in California found that while media education may increase Vietnamese women's awareness of the importance of Pap tests, an organized intervention utilizing lay health workers was critical to providing culturally adapted information to motivate women to actually get tested (Lam et al., 2003).

Taylor and colleagues (2002a) found culturally tailored in-home interventions addressing critical barriers to screening to be effective with Chinese American women. Researchers in Washington found that barriers to cervical cancer screening among Cambodian immigrants include “a traditional orientation to the prevention, causation, and treatment of disease; lack of familiarity with western early detection concepts; low levels of knowledge about cervical cancer; concerns about the Pap testing procedure; and health care access issues,” (Carey Jackson et al., 2000, p. 359). Taylor and colleagues (2002b) were only moderately successful in increasing cervical cancer screening through in-home interventions as well as neighborhood group meetings with Cambodian women.

It is difficult to find accurate statistics about the incidence of cancer and screening rates among the Hmong population in the US because they are typically aggregated into the “Asian American” category in terms of race and ethnicity. Cancer is the leading cause of death for Asian American women in the US, with breast cancer being the most common site for this group (American Cancer Society, 2008). Ross and colleagues (2003) used data from the Minnesota Cancer Surveillance System to calculate proportional incidence rates (PIRs) for breast and cervical cancer from 1988 to 1999.

Compared to all Minnesotans, the Hmong population had increased PIRs for cervical cancer, but decreased PIRs for breast cancer. Similarly, Mills and colleagues (2005) found that age adjusted incidence rates for Hmong in California were elevated for cervical cancer but lower for breast cancer. Moreover, the Hmong's age-adjusted incidence rate of cervical cancer is nearly three times as high as Asian and Pacific Island (API) women, and four times that of non-Hispanic white (NHW) women (Yang, Mills, & Riordan, 2004).

Several scholars have noted that when Hmong are diagnosed with cancer, it is typically at a later stage (Mills, Yang, & Riordan, 2005; Yang et. al., 2004). Thus, they tend to have a more advanced stage of disease at diagnosis and higher mortality rates than if it were discovered at an earlier, more treatable stage. Moreover, Yang and colleagues' (2004) study in California found that when diagnosed with cervical cancer, more than half of Hmong women chose "no treatment" as the first course of treatment, compared to 5.8% API and 4.8% NHW, which leads to a much lower survival rate for Hmong women.

Risk and protective factors for breast and cervical cancer

Early age of first pregnancy and multiparity elevate the risk for cervical cancer (Schiffman, Brinton, Devesa, & Fraumeni, 1996; Munoz et al., 2002). Despite the high incidence of cervical cancer in the Hmong population, epidemiological evidence has shown the Hmong are far less likely to get breast cancer, compared to other women (Mills et al., 2005; Mills & Yang, 1997; Ross et al., 2003). The Hmong are a young population, with 52% of women having their first child between ages 15 and 19 and

continuing to bear children until age 40-54 (Yang et al., 2006). While it is a risk factor for cervical cancer, early age at first child seems to serve as a protective factor for breast cancer, due to the body's biological defense mechanisms associated with human reproduction (Faller, 1992; Henderson, Pike, Berstein, & Ross, 1996; Robert et al., 2004; Russo, Moral, Balogh, Mailo, & Russo, 2005).

Screening rates of cervical and breast cancer

Utilization of screening services for early cancer detection has been disproportionately low in Asian subgroups (Wong, Gildengorin, Nguyen, & Mock, 2005). In the US, screening rates for breast and cervical cancer are low or non-existent in the Hmong population compared to non-Hispanic whites (Yang et al., 2006).

Hmong women are among those at highest risk for health problems. However, they greatly underutilize screening services because of an unfamiliarity with preventive services likely due to high rates of poverty, low levels of education, low socioeconomic status, a lack of English fluency and gender-defined role behavior (American Cancer Society, 2008; Khan, Partridge, Wang, & Schiffman, 2005; Mandelblatt, Andrews, Kerner, Zaubler, & Burnett, 1991; Tanjasiri, Kagawa-Singer, Foo et al., 2001; Wells & Horm, 1992; Yang et al., 2006). Moreover, the ability to speak English fluently is a big barrier to access and knowledge of health care options in the US.

Acculturation: definition and theory

Acculturation has been defined as a process of psychological and behavioral changes that occur when individuals and groups of different cultures come into contact (Berry, 1980; Berry & Sam, 1997; Gibson, 2001; Stonequist, 1935; Stonequist, 1937). The concept of acculturation was described by Gordon (1964) as a unidimensional process wherein retention of the heritage culture and acquisition of the receiving culture occupied opposing ends of a single continuum. Gordon's model explicated that as new immigrants adopted the values, practices and beliefs of their new homeland, they would discard those from their cultural heritage. Gordon described assimilation as a sequential process beginning with language and behavioral acculturation, then integrating socially and economically into the new society, and last, identifying with the new culture and abandoning the culture of origin.

More recently, however, scholars have argued against this unidimensional process concept. Berry's (1980) model of acculturation, for example, contains two independent dimensions, receiving-culture acquisition and heritage-culture retention. These two dimensions intersect to create four acculturation categories: assimilation, separation, integration and marginalization. In Berry's (1980) model, assimilation, which entails embracing the new culture and abandoning the old, is seen as one of four outcomes of acculturation, wherein Gordon (1964) viewed assimilation as the desirable end result for all immigrants.

As Schwartz and colleagues (2010, p. 240) note, “to understand acculturation, one must understand the interactional context in which it occurs.” This context, “includes the characteristics of the migrants themselves, the groups or countries from which they originate, their socioeconomic status and resources, the country and local community in which they settle, and their fluency in the language of the country of settlement.”

Acculturation is thought to occur at both the macro and micro level.

Several factors are thought to affect the extent of acculturation, including age at migration (Cortes, Rogler, & Malgady, 1994; Garcia & Lega, 1979; Hanassab, 1991; Richman, Gaviria, Flaherty, Birz, & Wintrob, 1987; Rogler, Cooney, & Ortiz, 1980; Suinn, Rickard-Figueroa, Lew, & Vigil, 1987; Tsai, Ying, & Lee, 2000), and the proportion of one’s life lived as an immigrant (Mainous, 1989; Marin, Sabogal, Marin, Otero-Sabogal, Perez-Stable, 1987; Triandis, Kashima, Hui, Lisansky, & Marin, 1982).

Both ethnicity and culture can also be determinants of acculturation. Ethnicity, which refers to membership in a group that holds a specific heritage and set of values, beliefs and customs (Phinney, 1996), is a particularly relevant concept with the Hmong population from Southeast Asia, in the United States, a country with European roots. Culture, implicit in the term acculturation, refers to shared meanings, understandings, or referents held by a group of people (Shore, 2002; Triandis, 1995). Culture may impact acculturation, or cultural change, in many ways. Rudmin (2003), for example, argues that the amount of acculturation needed to adapt to the receiving culture may be determined by the similarity between the receiving culture and the migrant’s heritage culture.

Another noteworthy factor to include in the conversation about the Hmong population's acculturation in the US is language. Scholars have noted that a shared language is a crucial part of national identity, and those who either speak other languages or cannot speak the native language, may be a threat to national unity (Barker et al., 2001; Huntington, 2004; Schildkraut, 2005). Language, then, is likely to "affect the ease or difficulty associated with the acculturation process," (Schwartz et al., 2010, p. 240).

Hmong immigrants primarily fall under Berry's (2006) classification of refugees. Berry (2006) defines refugees as persons who are involuntarily displaced by war, persecution, or natural disasters and are resettled in a new country, usually by virtue of agreements between international aid agencies and the governments of those countries that have agreed to accept the refugees. Other categories of migrants, including voluntary immigrants, asylum seekers, and sojourners are likely to be looked upon differently. Steiner (2009) argues that migrants such as voluntary immigrants who are seen as contributing to the receiving country's economy or culture, typically professionals or people with advanced degrees, may be welcomed, whereas refugees and asylum seekers may be seen as a drain on the receiving country's resources. Further, refugees may be more likely to face discrimination (Louis, Duck, Terry, Schuller, & Lalonde, 2007), which likely leads to resistance in adopting the receiving culture (Rumbaut, 2008). Yet another factor contributing to adapting to the receiving country's culture is the trauma that many asylum seekers and refugees, including Hmong, have likely experienced before migrating to the US (Akhtar, 1999).

Case studies

Franzen and Smith (2009) conducted focus groups with Hmong adults in the Twin Cities, utilizing Marin and colleagues' (1987) Short Acculturation Scale for Hispanics. They determined that, while Hmong who lived in the US longer were more likely to utilize food assistance, be more highly educated, have a larger household and higher income, increased acculturation of these adults has negatively impacted their weight and health. They also found that living in an extended family, a popular living situation in the Hmong population, was associated not only with decreased language acculturation but also with decreased social connections.

Considerations for working with a refugee population

Refugee needs

As Portes & Rumbaut (2001) discuss, it is essential to meet the needs of first and second generation refugees, as experiences during this time tend to determine whether refugees and immigrant families will be able to move out of poverty. Immigrants and refugees face the same healthcare access challenges as the rest of society, but with the added hurdles of language barriers and low-income status. Because of lack of access, immigrants and refugees, similar to the general U.S. population of uninsured, do not utilize clinics for routine care. Rather, they wait until their health problems have become severe, and they will go to the emergency room which must serve them regardless of ability to pay. As a young male medical student noted at the Hmong Healthcare Coalition Conference in April 2010, Hmong medicine focuses on acute care rather than chronic

disease prevention or treatment. They tend to have the attitude of, “if I don’t feel bad now, why should I go to the doctor or take medication?” For example, Hmong people would accept the idea of taking Tylenol to immediately cure a headache, but cannot comprehend the rationale behind taking a medication long term to help lower blood pressure. For Hmong women, Sage is just one program within a difficult to navigate U.S. healthcare system, and they are generally unfamiliar with it.

Ethical considerations

Hmong culture in the United States is very different than what it was in Southeast Asia. In their homeland, the Hmong tended to rely on traditional healers and/or shamans, as well as herbal medicines, for their needs. Many Hmong in the US are not familiar with Western medicine and will therefore turn to traditional medicine at least for their initial treatment or diagnosis (Mills et al., 2005). Access to traditional healers and remedies in the US is limited and the illnesses people encounter here are different from the ones they experienced in the past, requiring different care.

The decision of whether to seek medical assistance (financial/insurance programs) may be facilitated or hindered by many things, including socioeconomic status and experiences with Western medicine (Quincy, 1995). Despite the language and financial barriers to access, it would seem that culture, specifically religion, tends to be the greatest contributor to a lack of cervical and breast cancer screening in the Hmong population.

Certain Western medical practices conflict directly with Hmong religious beliefs. For example, they believe that one needs all their body parts for reincarnation. Thus,

having a mastectomy, for example, would be seen to weaken the body. Having the inside of the breast exposed on the operating table, some Hmong believe, would leave the body open to evil spirits entering (Owens, 2007). However, Yang and colleagues' (2004) study found that 64% of Hmong women indicated they would select Western treatments (chemotherapy, radiation or surgery) over traditional medicine as a first course of treatment if they were diagnosed with cancer.

There is also an evident lack of awareness in the Hmong community about cervical cancer, and screenings in particular (Yang et al., 2004). However, even if a Hmong woman is familiar, the “embarrassment associated with the intrusiveness of gynecologic exams and lack of experience with Pap tests are enough to discourage Hmong women from screening programs. In addition, sex and sexual organs are culturally silent issues that are hardly ever discussed in a traditional Hmong cultural environment” (Yang et al., 2004, p. 136).

These cultural differences in health beliefs and practices tend to lead Hmong women to have a lack of trust in, and increased fear of, Western medicine. Clinical exams, specifically Pap tests, are considered invasive – especially because shamans are able to diagnose women without having them undress (Kawaga-Singer et al., 2009). These procedures were not available in their homeland, so ensuring trust in the patient/physician relationship is crucial in dealing with these sensitive topics. Confidentiality is an important issue for the Hmong when dealing with the healthcare system, although it is a non-issue within the family, as many families make care-giving decisions together. The extent to which a family is acculturated and assimilated into

American culture has a great impact on the role these traditions play in Minnesota Hmong's everyday lives (Franzen & Smith, 2009).

Site for intervention

The Minnesota Department of Health's Sage Screening Program is a statewide comprehensive breast and cervical cancer screening program whose primary objective is to increase the proportion of age-appropriate women who are screened for breast and cervical cancer primarily by providing free screening and follow-up services to uninsured and underinsured women (Minnesota Department of Health, 2009). The program was developed in 1991 and receives about 80% of its funding from the Centers for Disease Control and Prevention (CDC), with additional funding from the State of Minnesota and Twin Cities Race for the Cure (Minnesota Department of Health, 2009). Sage works with 440 clinics statewide and screens nearly 20 thousand women each year.

Eligible participants in Sage are women age 40 to 64 who are uninsured or underinsured and make less than 250 percent of the federal poverty rate. Women are made aware of Sage primarily through direct mail pieces, which provide a toll free number for women to call to see if they're eligible. If they are eligible, the Sage phone recruiter matches the woman with a nearby clinic and schedules her for a screening appointment. Recruiters are trained in motivational interviewing to help patients address barriers such as arranging for transportation or interpreters.

Sage is underutilized by Hmong women

While Sage is available for all eligible Minnesota women, it is grossly underutilized by the Hmong population. By comparing the 2005 numbers for minority populations in Minnesota to minority participation in Sage, it is clear that Sage effectively recruits the American Indian and Hispanic population, with just over four times more representation in the program than the overall state population in both groups (Sage Screening Program, 2009). Consistent with nationwide screening trends, Asians have less than half the number of participants in Sage in relation to their proportionate population in the state. Moreover, by analyzing the database of the nearly 121,000 women who have participated in Sage since its inception, there are less than 300 Hmong participants. Thus, while the Sage population is substantially less white than the Minnesota population overall, it has an unacceptably small 0.24% Hmong participant rate, while the 2000 census puts Minnesota's Hmong population at about 0.85%.

In defense of direct mail

While there may be some apprehension upon using a direct mail approach with a target population that is largely illiterate, it is the most often used and most effective media within the Sage Screening Program (C. Nelson, personal communication, June 7, 2010). Therefore, it is rational to adapt direct mail material for use with a new population. Slater, Henly and colleagues (2005) discuss the effectiveness of coupling an incentive with a direct mail piece, as was done for the present study, to recruit low income, underinsured women. Slater has helped design a number of direct mail pieces for Sage,

including several adapted for the American Indian and Hispanic communities. Among the direct mail pieces routinely used to promote Sage, the Robinsons piece typically produces one of the highest call volumes (Minnesota Department of Health, 2010).

While direct mail tends to have low response rates (Gerbert et al., 1997; Salmon, Loken & Finnegan, 1985), its unique tailoring capabilities and strength at reaching a very specific audience segment can often outweigh this weakness. As much research has shown (King, Rimer, Seay, Balslem, & Engstrom., 1994; Murray et al., 1988; Placek, 1974; Salmon et al., 1985; Taplin, Anderman, Grothaus, Curry, & Montano, 1994), “although direct mail may not be an effective strategy for altering core attitudes and beliefs about health behaviors, mailed interventions can prompt behavior, enhance awareness, and reduce specific knowledge gaps” (Slater et al., 2005, p. 2346).

Admittedly, while a direct mail piece was adapted, it was not disseminated as such. Due to several unique traits of the Hmong population, including low levels of literacy and education, this non-mail approach is likely beneficial, at least for initial message testing. It would be relatively easy to efficiently send out a direct mail piece, targeting households in the state with one of 18 Hmong clan names.

Theoretical justification for message design

Prospect theory and loss framing

Several scholars have used prospect theory to create successful persuasive health messages promoting breast self-exams and mammogram utilization (Abood, Black, &

Coster, 2005; Banks et al., 1995; Meyerowitz & Chaiken, 1987). As Tversky & Kahneman (1981) describe prospect theory, people tend to avoid risk relative to some psychological reference point, even if the message they are viewing tells them they can make a gain by taking a risk. Tversky & Kahneman's theory postulates that decision making depends on how choices are framed. Messages that utilize a loss frame, that is, they are framed from the perspective of "if you do not do X you will lose Y", tend to be more persuasive in motivating action than gain-framed messages when audience members have the perception that "doing X" may result in risky or uncertain outcomes (Rothman & Salovey, 1997). Thus, as shown in the direct mail piece, the (Vang) family lost their grandmother because she did not get a mammogram or Pap test early enough to detect her breast or cervical cancer when it would have been treatable. While text provides context for the photo, information about Sage and a call to action, the message as a loss frame is fairly evident with merely the picture – which is essential with a primary audience that will likely not be able to read the text of the message in either language.

Fear appeals and the Extended Parallel Process Model

Witte's Extended Parallel Process Model, or EPPM (Witte, 1992; Witte, Meyer, & Martell, 2001), explains the decision to utilize a fear appeal message. Based on Rogers's (1975, 1983) Protection Motivation Theory and Leventhal's (1970) danger control process, the EPPM states that a fear appeal initiates two appraisals in the audience member. First, the audience member appraises the threat. If the audience member feels the threat is moderate to high, they will become fearful and motivated to both act on the

threat (Easterling & Leventhal, 1989; Lang, 1984) and begin the second appraisal. The second appraisal involves evaluating the efficacy of the recommended response. In the proposed message, the threat is one of the female audience members dying from breast or cervical cancer because she did not get a mammogram or Pap test. The recommended response is calling Pa, at Sage, who is fluent in both Hmong and English. Ideally, both perceived threat and perceived efficacy will be high so the audience member will be motivated to control the danger by thinking of strategies to avert the threat (Witte et al., 2001).

As one would imagine, individual differences impact threat and efficacy appraisal. Thus, an audience member's unique prior experiences, as well as culture, religion and personality characteristics will play a role in their threat and efficacy appraisal (Witte et al., 2001). Hopefully the threat of a mother or grandmother dying within a year and a half is great enough that women would call or other family members would encourage them to call Sage. While statistics may be useful motivators to increase response efficacy, (e.g. how many women's lives have been saved by Sage, or the effectiveness of various screening tests) they are not being included in the message. This is primarily due to a low health literacy and general unfamiliarity with cancer and screening tests in the target audience. However, self efficacy should be increased with the note that women can call Sage and talk to Pa, who was present at all recruitment events, in either Hmong or English.

Theory of Reasoned Action

The Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) suggests that behavior ultimately is a result of the attitudinal, normative and efficacy beliefs that people hold about performing that behavior. While women in the precontemplation stage (of change) (Slater, 1999) are exempt, TORA presupposes some recognition, attention and cognition about the behavior of interest, in this case, calling Sage to make an appointment to obtain a mammogram. According to TORA, when women receive the proposed health message, their beliefs about learning the results of their mammogram or Pap test (I do/not care that I do/not have cancerous breast/cervical tissue) will be weighted by how they evaluate those results (is it important to know, do I want to know, how will knowing impact me?), alongside their perceptions of others' expectations of their getting a mammogram (my husband/daughter thinks I should), weighted by their motivation to comply (I don't/care a lot about what my husband/daughter thinks I should do). Since family is so important in Hmong culture, the proposed message emphasizes the importance of screening in relation to being there for your family. The intent is to show the woman that she needs to get screened so she will be in the family photo 18 months from now, and also to encourage other members of the family to express their concern and motivate their grandmother, mother or wife to call Sage to schedule her mammogram so this woman will be alive in 18 months.

Social Cognitive Theory and social influence

Social Cognitive Theory (Bandura, 1977; 1986) suggests two factors that influence whether or not the audience will adopt a health-protective behavior. In relation to the proposed health message, hopefully women will see that the benefits of performing the behavior will outweigh the negative outcomes. In this case, the negative outcomes are not so much monetary costs, but more the social stigma around using a government program, the emotional distress that results from using invasive Western medicine, and perhaps most importantly, the fear of hearing “you have cancer.” In general, people utilize cancer screening services to learn they *don't* have cancer. If women can realize that hearing they are cancer free far outweighs the distress associated with screening and fear of a cancer diagnosis, they will be more likely to adopt the health-protective behavior promoted in this message. Second, Social Cognitive Theory suggests, in relation to the proposed message, that the women must have strong self-efficacy with respect to calling Sage. Self-efficacy is encouraged in this message by identifying a bilingual phone staff member on the mailing. That is, women can call Sage's toll free number and speak to Pa either in English or Hmong, thus decreasing the language barrier and increasing women's self-efficacy with regards to picking up the phone to call Sage.

Additionally, Social Cognitive Theory and social influence have been utilized with the dissemination strategy. As discussed, a mass media strategy was not utilized, but rather community health representatives handed these direct mail pieces out at a local market where the Hmong gather in a social setting. By seeing their peers pick up these pieces, talk to community health representatives, and express positive attitudes toward

Sage, women should be encouraged to model their behavior off of their peers and talk to the community health representatives. Further, when socializing, one would hope that women with positive attitudes toward the message and the suggested behavior will act as opinion leaders and utilize interpersonal communication to help disseminate the message (Katz & Lazarsfeld, 1955; Southwell & Yzer, 2007). As Social Cognitive Theory suggests, when opinion leaders positively and visibly endorse Sage, or even the idea of getting screened for breast and cervical cancer, the likelihood of other women gaining self-efficacy and imitating this behavior will be enhanced, and the likelihood of their intentions evolving into behavior (calling Sage) will be increased.

Tailored health communication

Rimer and Kreuter (2006, p. S184) describe tailored health communication as “any combination of information and behavior change strategies intended to reach one specific person based on information unique to that person, related to the outcome of interest, and derived from an individual assessment.” The intent of tailored health communication is to make the audience more likely to “attend to communication, think about them, find them relevant and salient, and intend to take action,” (Rimer & Kreuter, 2006, p. S184). It has been utilized to address a wide range of health problems, including health promotion and the early detection of cancer (Kreuter, Strecher, & Glassman, 1999).

The primary reason for creating tailored health communication is to adapt messages to the individual so it becomes more personally relevant (Strecher et al., 1994).

Materials which are seen as more personally relevant are more likely to also be attention grabbing and be more talked about with others than non-tailored materials (Kreuter, Strecher, & Glassman, 1999). Scholars have also found that tailored messages are more successful, memorable, and perceived as more relevant and credible (Abrams, Mills, & Bulger, 1999; Kreuter & Skinner, 2000; Rakowski, 1999; Skinner, Campbell, Rimer, Curry, & Prochaska, 1999). The major limitation of print tailored health communication, as is the case with all print health communication, is that, while one can tailor communications based on age, gender, behavior, or any number of characteristics, low literacy may still hamper its effect (Pasick, Hiatt, & Paskett, 2004).

While there are several variables upon which one can tailor health communication materials, the current research primarily utilizes tailoring based on cultural constructs while also taking into consideration behavioral constructs. The current research utilizes race and language as its two main cultural variables, while the entire message concept is focused on the cultural priority of family. The family photo and the name are unique to Hmong culture, and the entire message is written in both Hmong and English, with the idea that, if the women being targeted cannot read Hmong, someone in their household will be able to read English.

Skinner and colleagues (2002) varied aspects of a health message based on several factors, including race and religion. Graphics, for example, varied based on whether women in their sample were Black, White, or Jewish. Kalichman and Coley (1995) suggest that the source photo should be tailored not only on demographic characteristics, but also based on culturally relevant values and beliefs. The current study

takes race, ethnicity and values into account, with a White family in a typical casual posed picture on the porch, and a Hmong family, in a typical less-casual posed picture in front of a story quilt – a prized possession in a Hmong family.

Many tailored health communications are created based on variables from several health behavior models. Behavioral construct tailoring, dubbed by Kreuter and colleagues (2004), includes variables such as self-efficacy, perceived barriers, knowledge and motivational readiness. To increase self-efficacy in the current materials, a name has been attached to the phone number. Whereas many direct mail pieces simply give a toll-free number, this piece tells the audience to “Call Pa... to speak in Hmong or English.” This was done both to build a relationship between Pa, a community health representative present at all Hmong recruitment events, and to decrease the perceived language barrier.

Rimer and Kreuter (2006) note four ways in which tailoring can be used to enhance motivation to process health information. First, many studies have shown that tailoring can enhance motivation by matching message content to an individual’s information needs and interests (e.g., Brug et al., 1999; Campbell et al., 1994; Kreuter & Strecher, 1996; Prochaska, DiClemente, Velicer, & Rossi, 1993; Rimer et al., 2002; Skinner, Strecher, & Hospers, 1994). Second, the current study attempts to frame health information in a meaningful context by showing the importance of cancer screening to one’s family. Because family is highly valued in the Hmong population, specifically the idea of women as caregivers, there should be more motivation to process the graphic message that the woman needs to get screened so she can be there for her family. Third, the current study uses design and production techniques, including color photos and a

tactile die-cut message to capture women's attention. Last, Rimer & Kreuter (2006) note that to enhance motivation to process, the information must be provided in the amount, type, and channels of delivery preferred.

Petty and Cacioppo's Elaboration Likelihood Model, or ELM, is consistent with this approach of explaining tailoring effects (Petty & Cacioppo, 1981). The ELM states that people are more likely to be active information processors when they feel higher levels of motivation and ability. As suggested by dual-process models of persuasion (Chaiken, Liberman, & Eagly, 1989; Petty & Cacioppo, 1986), it is likely that source characteristics play multiple roles in message reception. For example, when an audience member has a low elaboration likelihood, that is, they lack the ability and/or motivation to consider a message, they are likely to utilize source factors as heuristic cues (e.g., Chaiken, 1980; Maheswaran & Chaiken, 1991; Pallak, 1983; Petty, Cacioppo, & Goldman, 1981). Examples of source factors include the source's expertise, likeability or attractiveness.

Source similarity can be considered a component of source attractiveness. While a disputed attribute, Brock (1965) found that a similar source changed behavior significantly more than a dissimilar source. For this experiment, source similarity is defined as source matching. That is, when the photo and surname, as described later, are either of a Hmong or a Caucasian family. The "matched" source, for a Hmong woman, is the piece with the Vang family photo and name. The "unmatched" source is the Robinsons, a Caucasian family.

Research question 1: To what extent does source matching play a role in a direct mail campaign targeting Hmong women?

Hypothesis 1a: For Hmong women, a bilingual direct mail piece with a Hmong family photo and surname will generate more interest in Sage than the same piece with a Caucasian family photo and surname.

Hypothesis 1b: For Hmong women, a bilingual direct mail piece with a Hmong family photo and surname will generate higher intention to call Sage than the same piece with a Caucasian family photo and surname.

Hypothesis 1c: For Hmong women, a bilingual direct mail piece with a Hmong family photo and surname will generate higher intention to share the piece with friends and family than the same piece with a Caucasian family photo and surname.

Hypothesis 1d: For Hmong women, a bilingual direct mail piece with a Hmong family photo and surname will generate higher message evaluation scores than the same piece with a Caucasian family photo and surname.

Because acculturation likely plays a role in the outcomes of the above hypotheses, I pose another research question and set of hypotheses which takes this variable into account.

Because women who are more acculturated are more likely to accept and use Western health care and government programs (Allen et al., 2004), I believe they will have more positive attitudes, evaluations, and intended behavior.

Research question 2: To what extent does acculturation play a role in a direct mail campaign targeting Hmong women?

Hypothesis 2a: Hmong women who are more acculturated will report more interest in Sage than those who are less acculturated.

Hypothesis 2b: Hmong women who are more acculturated will report a higher intention to call Sage than those who are less acculturated.

Hypothesis 2c: Hmong women who are more acculturated will report a higher intention to share the piece than those who are less acculturated.

Hypothesis 2d: Hmong women who are more acculturated will generate higher message evaluation scores than those who are less acculturated.

Because acculturation and source matching may both affect women's attitudes and intended behaviors, I pose another set of hypotheses where acculturation is introduced as a moderator in the relationship between source matching and outcome measure.

Hypothesis 3: A bilingual direct mail piece with a Hmong family photo and surname will generate more interest with less acculturated women than more acculturated women.

Hypothesis 4: A bilingual direct mail piece with a Hmong family photo and surname will generate a higher intention to call with less acculturated women than more acculturated women.

Hypothesis 5: A bilingual direct mail piece with a Hmong family photo and surname will generate more intention to share for less acculturated women than more acculturated women.

Hypothesis 6: A bilingual direct mail piece with a Hmong family photo and surname will generate higher message evaluation scores with less acculturated women than more acculturated women.

It is important to know the extent to which source matching and acculturation impact a Hmong woman's behavior in reaction to a direct mail campaign. Depending on the general level of acculturation in the Hmong population, and more specifically the level of acculturation of Hmong women in the campaign's target population, materials should be adapted differently. For example, if source matching appears to be a big factor, regardless of acculturation level, campaign materials should strive to utilize source matching when targeting Hmong women. Or if a woman's level of acculturation greatly impacts the extent to which source matching is important, care needs to be taken to analyze the level of acculturation of the target audience, and adapt materials accordingly.

Chapter Three: Methodology

Participants

Data for this study was gathered from a sample of 76 women who self-reported as Hmong, at the Hmongtown Marketplace, a flea market in Saint Paul, Minnesota. The flea market is open every day and is a vibrant shopping and social scene each weekend, attracting hundreds of Hmong people from the metro area and across the country. Participants were recruited to complete a brief survey with a bilingual community health representative, in return for a ten dollar gift card and some small promotional items.

Participants were all female and ranged in age from 30 to 80 years ($M=54.4$, $SD=10.8$). Almost two thirds of participants reported having no formal education; the rest primarily took English as a second language (ESL) classes, or other adult learning classes through their church or community organization. Six women had their high school degree and three had a bachelor's degree. Educated women were among the younger in the sample. See Appendix C for descriptive statistics of the sample.

Nearly 72 percent of participants reported some knowledge about both mammograms and Pap tests. However, only 63 reported having a clinical breast exam, 60 percent have ever had a mammogram and 62 percent reported ever having a Pap test. No women reported ever being diagnosed with any type of cancer.

Measures

Independent variable: source matching

As discussed in depth in the following section, there were two versions of the message distributed. The control message was called The Robinsons. It included a photo of a Caucasian family with an American name, and a message written in both Hmong and English. The treatment message was called The Vangs. It included a photo of a Hmong family with a Hmong name, and the same bilingual message. Participants were randomly assigned to the treatment or control message. Despite best efforts to be equal, 33 women viewed the Robinsons piece and 43 viewed the Vangs piece.

Dependent variables: attitude, behavioral intention, and message evaluation

The last question of the survey measured participants' attitude toward the Sage Screening Program. A simple yes/no question asked if they were interested in the program. Of the 76 women who completed the survey, 38 replied they were interested, 24 replied they were not, and 14 either refused or did not make it to the end of the survey. See Appendix C for descriptive statistics and distribution graphs of key variables.

Participants' behavioral intention was measured with two questions asking how likely they would be to both share the card with a friend or family, and how likely they would be to call Sage. The behavioral intent question asking how likely they would be to share the card was measured on a 5 point Likert scale (1=definitely share this card, 5=definitely not share this card, $M=2.64$, $SD=1.02$). The behavioral intent question asking

how likely they would be to call Sage was also measured on a 5 point Likert scale (1=definitely will call, 5=definitely will not call, $M=2.74$, $SD=1.03$).

Message evaluation was measured using five questions with five point Likert scales (1=positive evaluation, 5=negative evaluation; see Appendix A for each question's exact wording) measuring the degree to which the message, including both the photo and text, was personally relevant, convincing, believable, important and attention-getting. The message evaluation scale held together extremely well, with a Cronbach's Alpha of .923 ($M=3.10$, $SD=1.25$).

Acculturation measures

The majority of acculturation measures focus on one or more of the following factors which are assumed to be a function of acculturation: cultural behavior, cultural identity, and language (Zea, Asner-Self, Birman & Buki, 2003). Cultural behavior is defined as friendship choices and media preferences. Cultural identity is operationalized as one's self-identification, affiliation, and pride as a member of the culture of origin or of the host culture. Language proficiency includes use, preferences, and ability (Kim & Abreu, 2001).

The scale used for this research project was adapted from the Abbreviated Multidimensional Acculturation Scale, or AMAS-ZABB (Zea, Asner-Self, Birman & Buki, 2003). It is both bilinear and multidimensional, and, at forty-two questions, relatively short. The AMAS-ZABB was validated both in the college and community setting with the Latino population. The authors hope that the scale will prove useful with

other ethnic groups, both in the US and other countries. The questions measure language proficiency of both English and native language, identity with both the US and native country, and competence with both the US and the native country's culture.

Due to time and comprehension limits, the survey used in the present research adopted twelve Likert scale questions from the AMAS-ZABB instrument. The present research asked two questions about participants' literacy; one question for each language (Cronbach's Alpha=.584), three questions about their language use in various environments (Cronbach's Alpha=.697), three questions about social and food preferences (Cronbach's Alpha=.358), and four questions regarding their identification with and pride in both American and Hmong culture (Cronbach's Alpha=.433). As was done with the message evaluation questions, all scales were shortened to five levels to better suit participants' comprehension abilities. Because language competence is central to this study, a new scale was created, using only responses from the five language-related questions: two questions on literacy and three on language use. The three questions on language use were reverse-coded so they were consistent with literacy responses. These three re-coded language use questions, along with the two literacy questions were used to create a new scale measuring language acculturation (Cronbach's Alpha=.772, $M=4.63$, $SD=.76$), where 1=high acculturation based on language use and literacy, and 5=low acculturation based on language use and literacy. See Appendix A for the full survey instrument.

Other variables related to acculturation include education and percent of life lived in the US. To measure education, participants were asked if they have gone to school at

all. If they answered “yes,” they were then asked if they had no degree, a high school degree or its equivalent, an associates degree, bachelors degree, or something higher. Level of education and level of acculturation were fairly strongly correlated ($r=.706$). Participants were also asked their age and, later, how long they have lived in the US. The number of years lived in the US was divided by age to find the percentage of their life lived in the US. On average, women in this study lived 39% of their life in the US. In this sample, percentage of life lived in the US was not strongly correlated with acculturation level ($r=.159$).

Materials and dissemination

This study’s primary intent is to enhance awareness of Sage and prompt behavior among 40-64 year old Hmong women and their families living in Saint Paul, Minnesota. The secondary intent is to reduce specific knowledge gaps. Because low-income women are often less knowledgeable in the health arena, they are more likely to resist acting on previously proven communications touting the importance of screening, risk factors and screening guidelines (Brown et al., 1996; Lerman, Rimer, Trock, Balshem, & Engstrom, 1990; Mickey, Vezina, Worden, & Warner, 1997; Phillips, Glendon, & Knight, 1999; Simon et al., 1998). Stoddard and colleagues (1998) encourage the use of persuasive strategies to increase compliance when resistance is anticipated. As Kreuter & McClure (2004) noted, peripheral approaches, linguistic strategies and sociocultural approaches are crucial to designing culturally appropriate health messages.

Peripheral approach

Using a peripheral approach, health communicators can broadcast their message to appeal to their audience by choosing certain colors, images, fonts or pictures that “overtly convey relevance to the group,” (Kreuter & McClure, 2004, p. 445). Regardless of literacy, the language of pictures, colors and images can be perceived almost immediately. Because of low literacy levels of both Hmong and English in the target population, a direct mail piece was chosen in which the main message can be conveyed with only a photo. The experiment has two conditions: one piece has a picture of the Robinsons, a Caucasian family sitting on a porch; the other piece has a picture of the Vangs, a Hmong family standing in front of a story quilt. Both families are characteristic of their culture. The Robinsons piece has a mom, dad and three kids; whereas the Vangs piece has a family of seven, including a grandmother, mom, dad, two teenage kids, one younger child, and an infant. The photo in the Robinsons piece is a black and white photo in a sepia tone, making it appear softer and friendlier. The photo in the Vangs piece is in full color, to show the beauty of the story quilt in the background, a prized possession in Hmong families. Both photos are in an identical tarnished gold frame. Both versions of the piece were printed on white matte 8 ½ x 11 cardstock. See Appendix B for campaign materials.

Linguistic Strategy

While it seems commonsense, it must be noted that “linguistic accessibility is the lowest common denominator of cultural sensitivity,” (Rogler, Malgady, Costantino, &

Blumenthal, 1987, p. 566). The message utilized in the direct mail piece is accessible to both Hmong women and their families by including both Hmong (their native language) and English. The message was translated by a professional translation agency, then back translated by five individuals, and revised.

Since there are not Hmong words for mammogram or Pap test, for example, the phrase “breast and cervical cancer screening” is utilized. Especially because of low rates of health literacy, acknowledging the body part and “cancer screening” is more efficient than using several non-direct terms to describe the two actual tests. Supplementary information is provided in the translated message as needed to retain the original English message’s meaning and context.

Sociocultural approach

Since the Hmong value family above nearly everything else, the key point in this message is for Hmong women to get screened so their family does not lose them. By using this message, the Hmong’s cultural values and beliefs are included in this message to provide context to a potentially unfamiliar and scary health behavior.

Dissemination

As Allen and colleagues (2004, p. 301) note, “For immigrants and refugees, finding useful health information is just one piece of the huge task of adapting and surviving in a new country.” For women who have had minimal exposure to Western culture and healthcare, finding appropriate resources to obtain preventive medical

services can be a daunting task. Allen and colleagues therefore recommend getting involved in the community to see what works. Thus, the message was disseminated – both on paper and with the help of bilingual community health representatives, in the community, at a Hmong flea market. The author and community health representatives were stationed at a table near the main entrance for about four hours, every Saturday and Sunday, for three weekends in June, 2010. In addition, this study was piloted one Saturday in May.

The author was joined at the market by two to five female community health representatives each time. Their ages ranged from 21 to 27. They were all fluent in both English and Hmong, primarily speaking Hmong at home but English at work and school. Since Hmong was not a written language until 1953 (Owens, 2007), many Hmong, regardless of education level, cannot read it. Thus, the survey was written in English and the community health representatives translated it in their head to speak to women who were more comfortable speaking Hmong. The community health representatives were trained in motivational interviewing and reviewed how to translate several questions which included medical terminology. There are notes throughout the survey, as well as a written document in Hmong, which speak to these specific questions, to ensure that everyone was asking the questions the same way in Hmong.

A table was set up with the Sage Screening Program banner on front, an educational flipbook titled “For yourself and your family, get mammograms and Pap tests,” as well as bilingual informational fliers and promotional items. Community health representatives engaged interested women in conversation. They acknowledged that,

upon completion of the survey, women would receive an incentive: a ten dollar gift card to WalMart or Target, as well as a reusable grocery bag and hand sanitizer, both branded with Sage's logo and phone number.

Both versions of the direct mail piece express the same message, with identical language other than the family name. On the Hmong version, there is a casual photo of a six-member Hmong family in a frame and the front reads (in both English and Hmong) "The Vangs now." The card opens to reveal (in both English and Hmong) "The Vangs eighteen months ago" and the same family photo but with the family's grandmother included on the edge of the photo. Likewise, the Robinsons piece shows a casual four-member single-father family on the outside and reads (in both English and Hmong) "The Robinsons today." The card opens to reveal the same family photo but with the mother included on the edge of the photo. The inside reads "The Robinsons eighteen months ago." The inside text of both versions reads, in both English and Hmong:

Take advantage of the Minnesota Department of Health's free breast and cervical cancer screening program.

It's easy. To learn more, or to schedule an appointment at a clinic near you, call Pa:

651-556-0689 to speak in Hmong or English

Chapter Four: Results

Main effects

To address research question 1, the role of source matching was examined. To test hypothesis 1a, a chi-square test was performed to see if the photo and surname utilized impacted women's interest level. The difference between interest for women who viewed the control and treatment pieces was not significantly different ($p > .05$). Changing the photo and surname did not significantly impact whether women were interested in Sage.

To test hypothesis 1b, an independent samples t-test was performed to see if the photo and surname impacted women's intention to call. There was a significant difference in intention to call for Hmong women who viewed the treatment and control pieces ($B = .724$, $t(72) = 3.146$, $p = .002$). Hmong women who viewed the treatment piece had a higher intention to call. This finding tells us that adapting the piece with a Hmong photo and surname was important to increase intention to call in this population.

To test hypothesis 1c, an independent samples t-test was performed to see if the photo and surname impacted women's intention to share the piece. The difference between intention to share for women who viewed the treatment and control pieces was not statistically significant ($p > .05$). Changing the photo and surname did not significantly impact women's intention to share the piece.

To test hypothesis 1d, an independent samples t-test was performed to see if the photo and surname impacted women's message evaluation scores. The difference

between message evaluation scores for women who viewed the treatment and control pieces were not statistically significant ($p > .05$). Changing the photo and surname did not significantly impact women's message evaluation scores.

To summarize, the only variable for which the Hmong photo and surname had a significant effect was intention to call. Hypothesis 1b is supported. Hypotheses 1a, 1c, and 1d are not supported. The difference between the Vangs piece and the Robinsons piece did not affect women's interest in the program, intention to share the piece, or message evaluation scores.

Research question two explores the role of acculturation on the above dependent variables. The following hypotheses are tested using the 5 item acculturation scale created from language and literacy questions. To test hypothesis 2a, logistic regression was performed to test the impact women's level of acculturation had on their reported interest in Sage. Level of acculturation did not significantly predict whether women were interested in Sage ($p > .05$).

To test hypothesis 2b, a linear regression was run to explore the impact acculturation had on women's reported intention to call Sage. Level of acculturation did not significantly predict women's intention to call Sage, however, with a larger sample size and more power, it may prove to be a significant predictor ($B = .268$, $t(69) = 1.748$, $p = .085$).

To test hypothesis 2c, a linear regression was run to explore the impact acculturation had on women's reported intention to share the piece with friends and

family. Level of acculturation did not significantly predict women's intention to share the piece, however, with a larger sample size, it may prove to be a significant predictor ($B=.284$, $t(69)=1.828$, $p=.072$).

To test hypothesis 2d, a linear regression was run to explore the impact of acculturation on women's evaluation of the piece. Acculturation level significantly predicted message evaluation scores ($B=.548$, $t(69)=2.996$, $p=.004$), with more acculturated women evaluating the message more positively.

To summarize, the only variable for which women's level of acculturation had a significant effect on was message evaluation, although intention to call and intention to share were trending toward significance. Acculturation level had no significant impact on women's interest in Sage. Hypothesis 2d is supported. Hypotheses 2a, 2b, and 2c are not supported.

Moderation

To test hypotheses 3 through 6, univariate ANOVA analyses were run to determine if there was an interaction between the source photo/surname, acculturation, and each of the dependent variables. A separate ANOVA was run for each dependent variable, using both the photo/surname variable and the language- and literacy-based acculturation scale as independent variables in each analysis. There were no significant interactions between the photo/surname, acculturation, and either interest ($p=.156$), intention to call ($p=.143$), intention to share ($p=.401$), or message evaluation scores ($p=.214$). Varying levels of acculturation did not significantly change the relationship

between the photo/surname and either interest, intention to call, intention to share, or message evaluation scores.

Chapter Five: Discussion

Importantly, as shown with the support of hypothesis 1b, adapting the materials with a Hmong photo and surname significantly impacted women's intention to call. The intervention site's main use of direct mail materials is to encourage women to call. Thus, being able to adapt a piece to another culture, simply with a relevant photo and surname, seems like a quick and relatively inexpensive way to reach a new population. One could imagine similar adaptations made for other groups such as Hispanics or American Indians.

However, as shown with the results of many other hypotheses, a simple photo and surname switch did not make women evaluate the pieces any more positively, nor did it make them more interested in Sage or more likely to share the piece. On the macro level, it is inappropriate to assume that translating a message and including a culturally relevant photo is an adequate cultural adaptation. As discussed in depth in the next section, there is still much research to be done to determine the appropriate way to recruit Hmong women into a free cancer screening program. Admittedly, direct mail may not be the appropriate approach to take, however, as it is a proven method with the intervention site, it seemed a reasonable first step. While frustrating, it is still useful to find that a certain method may not work.

Many women did not understand what Sage was. Several women thought it was a single clinic, a common misconception run across in introducing the program. Some women thought the Sage-branded promotional items were actually products being sold by

Sage. As a result of this confusion, many women were not interested in Sage or talking to the community health representatives and completing the survey. These women expressed low motivation and very low ability to process the message. Thus, as the ELM suggests, women likely used heuristic cues such as source attractiveness and source similarity to process the message.

Despite reluctance in talking to community health representatives, there were no reported negative attitudes toward Sage itself. Even women who were not interested in the program felt the need to qualify their disinterest by acknowledging they were not Minnesota residents or were fully covered by their insurance. These positive attitudes were reassuring because there was a lot of initial uncertainty about how Sage, a government program promoting Western medicine, would be received in a flea market where there are dozens of Hmong vendors selling herbs and other traditional medicine.

While it was only used as a quantitative measure, the survey contained one open ended question which asked women what they thought the card's message was. Although not included in analysis, in part due to a low completion rate, this may have been the most insightful question included in the survey. The vast majority of women, particularly those who were older and/or less literate, ignored the card for the most part. As a function of their illiteracy or disinterest, they simply did not care to take the time to read or process the message, even with assistance of community health representatives who read it aloud in Hmong and explained the story told by the photo. This specific message was chosen because of its ability to partially overcome illiteracy with the photo's story. Unfortunately, however, most women did not understand the photo's message. A few

younger women made the connection that the mother/grandmother in the photo died as a result of neglecting her health, but most women simply commented that the photo was “good,” “pretty,” or it “looks like a healthy family.” Theoretically speaking, the loss framing’s effect was lost for the majority of the audience, especially, older women who comprised the primary target audience.

As a result of not understanding the core message, most of these women reported negative attitudes toward the message. Other than reporting low message evaluation scores, some women said, “I don’t understand the meaning of the card so why would I share it with others?” Others simply did not know *how* to share it with others. While the call to action was revised from its original form to increase self-efficacy in a culture that values personal connections and tends to speak two languages, participants’ lack of understanding of the message appeared to repress this effort. In terms of the EPPM, participants appraised the threat negatively. If they did not understand it, how were they to appraise it? As a result, they evaluated the efficacy of the call to action as very low. So, despite adapting the materials to be effective with a largely illiterate population, and making the call to action more culturally appropriate, its message was largely lost.

The same problem rings true when discussing the role of the Theory of Reasoned Action. TORA presupposes a set of considerations that people go through when making a decision. Because the first consideration, their beliefs about their screening test results, does not seem to have even come up, largely as a result of low education on both health topics and Sage and/or low cognitive abilities, the cultural adaptations such as focusing the message on family and personal connections were for naught.

Social Cognitive Theory and social influence, on the other hand, anecdotally played a large positive role in message dissemination; albeit they may not have been integral to message evaluation or attitude formation. Several women who completed the survey recruited friends or family to talk with community health representatives. While it is too early to see results, many women also took fliers to give to friends and family. They noted that, while they were insured, they had friends or family members who would be interested in the program. Other women were seen telling their peers how important it was to get these screening tests. While no participants had used the program before, it is easy to see how Hmong women who use Sage would encourage others to call as well. Because Hmong culture is more focused on oral communication, it seems that word of mouth will play a large role in future campaigns.

Limitations

There were two important limitations with regards to the data collected. First, the sample size, at 76, was very small. It is often difficult to reach significant results with a small sample size. Moreover, analyses with small samples simply may not have enough power to reach significance. There were a few hypotheses, including the impact of acculturation on women's intention to share and intention to call, where a larger sample size would have likely led to significant results. While a larger sample size was desired, limitations including time, compensation, staffing and other extraneous variables such as thunderstorms and political campaigning at the market made this challenging. In future outreach efforts, more care will be taken before data collection to ensure an adequate

supply of promotional items, as well as capable community health representatives, in order to achieve data collection goals.

The second limitation with regard to data collection is that, potentially as a result of collecting all data in the same location, there was very little variability in the key measures which contributed to the language-based acculturation scale used in analysis. While scores on this computed scale ranged from 2 to 5, the mean score was a 4.63. The majority of women reported no or very little acculturation based on language use and literacy. Thus, the acculturation measure was extremely negatively skewed. See Appendix C, Figure 3 for the distribution of the acculturation measure._

This skew could have potentially been overcome by collecting data at multiple locations, including churches or ESL classes, as women who attend these may be more acculturated. However, the low level of acculturation may simply be an attribute of the target population. While the skewed data is not ideal for data analysis, if all low income, uninsured or underinsured Hmong women age 40-64 in Minnesota are low in acculturation, this is an incredibly important attribute to consider when designing campaigns and outreach with this population.

In terms of basic communication, the absence of medical terminology in the Hmong language provided both obstacles as well as room for creativity. How does one promote a cancer screening program to a population whose language does not have a word for cancer? How does one encourage Hmong women to utilize their health insurance benefits and make an appointment to get a mammogram or Pap test, when

these words do not exist in their native tongue? With the help of translators, medical interpreters, and bilingual co-workers and friends, it was determined that the Hmong population is familiar with the word cancer. This word was used, spelled differently but pronounced the same, in translated materials. The next big challenge was translating “mammogram.” While a doctor may describe the procedure as “an x-ray of the breast,” there is no Hmong word for x-ray. A medical interpreter suggested the phrase “photo of the breast.” While this may conjure up thoughts of doctors taking pornographic images, several bilingual coworkers and friends agreed that this is standard translation. Despite these technical translation issues, most participants recognized the terms we used, even if they were unfamiliar with the exact procedures.

Another limitation of this research is the theories utilized. It is challenging to apply behavioral theories established in the US to a population which is not characterized by typical Western thought or values. While group tailoring may address some of these challenges, it is not an entirely satisfactory solution. Moreover, cultural differences are so great for anything from communicating with peers to business practices, that the straightforward task of reserving space at a market or recruiting Hmong volunteers to work as community health representatives took a lot of trial and error on behalf of the researcher. More qualitative work with community health representatives and women in the target audience, would help resolve this issue and lead to more productive research efforts.

Future directions

Further research

Most importantly, in designing materials to encourage behavior change (i.e. getting screened for breast and cervical cancer through Sage), one must know the target population's barriers to screening. Without this knowledge, one can only assume that Hmong women's barriers to breast and cervical cancer screening are in line with the barriers of other refugee or Asian populations to using Western medicine and/or government programs.

There have been studies of secondary data to examine screening rates in Asian subgroups (Wong, Gildengorin, Nguyen, & Mock, 2005), specifically the Hmong population (Yang et al., 2006). There have also been studies of barriers in other Asian populations (Lam et al., 2003; Taylor et al., 2002a; Taylor et al., 2002b), and qualitative studies done to address other health issues in the Hmong population (Franzen & Smith, 2009). However, no studies have been published which specifically address Hmong women's barriers to getting mammograms and Pap tests. From a review of the literature, it is hypothesized that several aspects of Hmong culture and religion are likely barriers, as are financial barriers to access. From the present research, one can see that a lack of education, both in general and on the prevalence of government assistance programs such as Sage, as well as knowledge about the importance of cancer screenings, and the screening tests themselves, are all important barriers to overcome.

While this question was not explicitly addressed in the survey or analysis, community health representatives noted women's reluctance to make an appointment to get screened, largely because of lack of transportation. It is easy to overcome this barrier with a program like Sage, for example, as Sage arranges free transportation to and from appointments for women who need it. Additionally, as a result of little or no health education, many women had very low perceived susceptibility to breast and cervical cancer. Several women declined services because they "weren't ready," despite being years overdue to begin routine screening.

Anecdotally, one Hmong woman who completed the survey got screened through Sage, and they found a 3.2 cm lump in her breast. The clinic called her back for additional breast tests. At the follow-up appointment, her clinician also advised her on high blood pressure readings. A few days after this appointment, she was notified the lab results came back and her Pap test was also abnormal. Despite receiving an abundant amount of free medical services and logistical assistance, this woman was still reluctant to schedule her colposcopy (the diagnostic exam a woman has done after an abnormal Pap test). A Hmong patient navigator at Sage tried her best to explain the importance of follow-up tests and the colposcopy procedure. Despite her best efforts, the woman's husband made the final decision that "we'll think about it."

It would also be helpful to assess the stage of change or willingness to get screened in the target population. While this was not directly measured with the survey, women's knowledge about breast and cervical cancer, and past screening behavior likely impact their stage (of change). It is conceivable, then, that we could make inferences

from their knowledge and behavior. As Rakowski and colleagues (1998) note, health messages should target different barriers for women in different stages.

Along these lines, scholars have noted that, for women who have not had a mammogram before (roughly 40% of participants in this study), mobile mammogram vehicles were proven effective vehicles to get them screened (Flynn et al., 1997; Rimer et al., 1992). Employees at both the Hmongtown Marketplace and Sage have expressed excitement around this idea. As Allen and colleagues (2004) note, vendors (such as Sage) tend to have better attendance when their services/materials are offered in conjunction with another event. Holding an intervention at the market or a community organization where community health representatives can direct women to a mobile mammogram van in the parking lot to get screened immediately seems promising.

Community-based interventions

As found at the market, there are several Hmong medical providers in Saint Paul. Many have their own practices and tend to see primarily Hmong patients. These providers try to build rapport in the community. While they do not currently provide Sage services, having Hmong providers communicate the importance of getting screened in the appropriate language and cultural context seems promising. Sage could easily provide bilingual promotional materials which these providers could distribute to their patients, encouraging them to call Pa.

As this study shows, Hmong women gain much more knowledge from talking with others than they do from reviewing written material. For this reason, Sage should

start utilizing lay health advisors in the community. As Pasick and colleagues (2004, p. 1157) note, “for target groups that are less educated or less acculturated and for many elderly, a familiar *other* from one’s own community or culture engenders trust.” A bilingual lay health advisor from within the Hmong community who would work as a liaison between women in the target population and outreach coordinators in Sage would be beneficial. The lay health advisor could not only recruit women to the program but, perhaps more importantly, educate them on what mammograms and Pap tests are, and when and why they are needed. They would relay this information in a relevant way to women in our target audience. Numerous studies have shown the effectiveness of using lay health advisors to promote breast and/or cervical cancer screening in Asian American populations (Bird, Otero-Sabogal, Ha, & McPhee, 1996; Lam et al., 2003; Taylor et al., 2002a) and with low-income women (Margolis, Lurie, McGovern, Tyrrell, & Slater, 1998). Sage could easily call Hmong women who have participated to inquire if they want to be screened again through the program and/or serve as a lay health advisor.

Similarly, a peer referral and peer education program would likely be effective in this population. The current intervention site has already implemented several iterations of a peer education and referral program (Slater, Finnegan, & Madigan, 2005). Hmong churches in the community would be a good outlet for promoting Sage in this fashion. Several studies have successfully integrated churches as one component of an intervention to increase screening behavior in minority communities, including African Americans and Hispanics (Davis et al., 1994; Eng, 1993; Erwin, Spatz, Stotts, & Hollenberg, 1999). As Xiong (2010) estimated, about 30-40% of Minnesota’s Hmong

practice Christianity, and most of these Hmong who are Christian belong to churches whose memberships are exclusively or predominantly Hmong. A church-based intervention would utilize the church's role as a source of social support and spiritual and moral guidance for women. The influence of both formal and informal opinion leaders within the church offers great potential for influencing health behavior change.

Interventions: screening event

A comprehensive, well-executed and promoted screening event could also prove beneficial. An all-day event, for example, where Sage would provide lunch and promotional items such as lotion or nail files would likely attract women. An event held at a clinic or church with free on-site screenings and leaders from the Hmong healthcare community speaking on the importance of screening, along with other relevant health topics such as healthy cooking or easy exercise would be informative and, hopefully entertaining and beneficial. Screening events are expensive, both in execution and planning. It costs Sage between 35 and 100 dollars to recruit one woman from the general population, using typical direct mail and televised phone banks, but much more time and money to recruit the hard to reach and rarely/never screened population (J. Slater, personal communication, July 14, 2010).

Representatives from Sage have experienced moderate success at local events. While often their main goal is simply increasing awareness of the program in the Hmong community, they also try to recruit women. There are two big annual community events: the July 4 soccer tournament, held on McMurray Field in Saint Paul, and the Hmong

New Year, which occurs in late November and was held at Excel Energy Center in 2009. Additionally, several Hmong community organizations host health fairs and educational seminars throughout the year to which Sage is often invited. These events would not only be great places for community health representatives to talk to women, but also to promote any future screening events. For example, it might be wise to plan an all-day event in late July which could be promoted at the soccer tournament, or an event in mid-December which could be promoted at the Hmong New Year celebration.

Media

Yet another potential route Sage could take to encourage breast and cervical cancer screening in the Hmong population, as well as recruit women to the program would be mass media. Because the target population has a low literacy rate in both Hmong and English, I recommend the use of television and radio more than print or online media. For example, Twin Cities Public Television broadcasts a program called ECHO (Emergency and Community Health Outreach). This program typically airs five times a day on Saturdays and Sundays on a variety of health and safety topics from H1N1, STD prevention and asthma, to being a safe driver. Each program is recorded in seven languages, including Hmong (TPT, 2010). The reporter, the expert interviewed, as well as all stock footage, utilizes members of the community to which the program is targeted. While colon cancer is currently the only cancer covered in ECHO's programming, it would likely be a good idea to approach them with this idea, especially as the intervention site could promote their program as part of a "what should I do?" segment for all ethnicities, not just Hmong.

Additionally, there is a Hmong radio station based in Saint Paul, *Hmong Minnesota Radio*, which airs both music and talk radio in Hmong all day every day (Hmong Minnesota Radio, 2010). This station, which regularly features a segment with a local Hmong doctor, could potentially be another outlet to utilize to both encourage screening and promote Sage.

In the event that print media is desired, there are two local newspapers which cater specifically to the Hmong population. Both *Hmong Times* and *Hmong Today* are Saint Paul-based newspapers, published every other week and distributed for free at Asian businesses and Hmong festivals. Distribution is statewide, but concentrated in Saint Paul (Hmong Times, 2010; Hmong Today, 2010). Sage could either purchase ad space or write or pitch a story about a Hmong cancer survivor in the community who Sage helped. Due to low literacy rates, much care must be taken in developing newspaper material.

Future interventions to increase cancer screening in the Hmong community may find it more useful to target the younger generations. As observed while collecting data and confirmed by several members of the Hmong community, most Hmong adults in our current target age range, 40-64, cannot read. They rely on their children to read and relay information to them. These children can read English but not Hmong. Children should be comfortable talking to their mothers and/or grandmothers about health topics, even personal, invasive procedures like we are promoting (N. Lee, personal communication, June 19, 2010). Several participants in this study even mentioned they did not understand the materials so they would give it to their child to read and explain. Yang and colleagues

(2004) suggested a multi-generation effort aimed at younger women, because they tend to be receptive to Western medicine health promotion efforts. Many younger women noted they would share it with their mother, mother-in-law or grandmother. Having children talk to their mothers/grandmothers about getting screened for breast and cervical cancer is just another way to show they love and respect their elders. Similarly, targeting the male head of households, who tend to make decisions for the family, could be another effective route.

Revising the message itself is another alternative, regardless of who is being targeted. While the rest of Minnesota knows what breast cancer and mammograms are, making fear-based messages like the Robinsons direct mail piece effective (J. Slater, personal communication, June 23, 2010), that is not the case with the Hmong population. Messages should be more direct and basic. They could focus primarily on education, and secondarily on promoting Sage. They could also encourage women who have insurance to utilize their coverage and get screened on their own.

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Appendix A

| | | | | |
|-----|------|------|-----|------------------------|
| Day | Date | Time | ID# | Interviewer's initials |
|-----|------|------|-----|------------------------|

Instructions for interviewer: Please ensure you circle an answer for each question. Read aloud all bold print. Do not read notes written in italics. Introduce yourself, then move forward with survey.

Thank you for talking with me today. I'd like to ask you some questions; would you be more comfortable talking with me in English or Hmong?

English Hmong

Continue to administer the survey in whichever language they prefer.

1. First, what is your age? _____

2. Would you say your health in general is....

Excellent Very good Good Fair Poor

3. When you are sick or need medical tests, do you have a usual place where you get care (ex. A specific clinic or hospital)? Yes No

If Yes, Is it a clinic, hospital, or other? Write name if provided

Clinic _____ Hospital _____
Other _____

4. Do you know about mammograms? Yes No

If Yes, What can you tell me about mammograms? Write out what she says, circle all that apply, and provide more information to her if necessary.

Procedure Suggested age Suggested frequency Other
Nothing Provided more info

If No, explain procedure and go to #5.

5. Have you ever had your breasts checked for cancer?

Yes No (go to #6) Don't know (go to #6)
Refused (go to #6)

If Yes, Did you have a mammogram (an x-ray of your breasts)?

Yes No Don't know Refused

6. Do you know about Pap tests? Yes No

If Yes, What can you tell me about Pap tests? Write out what she says, circle all that apply, and provide more information to her if necessary.

Procedure Suggested age Suggested frequency Other
Nothing Provided more info.

If No, explain procedure and go to #7.

7. Have you ever had a test to see if you have cervical cancer (i.e. Pap test)?

Yes No Don't know Refused

8. Have you ever been diagnosed with any type of cancer? (Has a doctor ever told you that you have cancer?)

Yes No Don't know Refused

If Yes, What type of cancer? _____

9. Have you ever had tests to check the levels of sugar or fat in your blood? You might have heard these called glucose, lipids, or cholesterol.

Yes No Don't know Refused

10. Do you, or does anyone in your household smoke cigarettes?

Yes No Refused

If Yes, Who? _____

Next I will ask you some questions about a card that we plan to mail to Hmong women to encourage them to call our program to schedule an appointment for a mammogram. Show woman the direct mail card.

Please take a moment to look at the card and read the message. After you are finished looking it over, I will ask you a few questions.

Which card did she review?

White/Robinsons

Hmong/Vangs

11. What message does this card send to you? Please think about both the pictures and the words.

12. Do you think this message was meant for someone like you? On a 1 to 5 scale, with 1 being definitely meant for someone like you and 5 being definitely not meant for someone like you, was it...

- 1 Definitely meant for someone like you
- 2 Very probably meant for someone like you
- 3 Possibly meant for someone like you
- 4 Probably not meant for someone like you
- 5 Definitely not meant for someone like you

13. How convincing do you think this message was? (Has this message changed your opinion about getting screened for breast or cervical cancer?) On a 1 to 5 scale, with 1 being extremely convincing and 5 being not convincing at all, was it...

- 1 Extremely convincing
- 2 Very convincing
- 3 Moderately convincing
- 4 Slightly convincing
- 5 Not convincing at all

14. How believable do you think this message was? On a 1 to 5 scale, with 1 being extremely believable and 5 being not believable at all, was it...

- 1 Extremely believable
- 2 Very believable
- 3 Moderately believable
- 4 Slightly believable
- 5 Not believable at all

15. How important do you think this message was? On a 1 to 5 scale, with 1 being extremely important and 5 being not important at all, was it...

- 1 Extremely important
- 2 Very important
- 3 Moderately important
- 4 Slightly important
- 5 Not important at all

16. How much do you agree or disagree with the following statement: This message caught my attention. On a 1 to 5 scale, with 1 being strongly agree and 5 being strongly disagree, do you...

- 1 Strongly agree
- 2 Agree
- 3 Undecided – neither agree nor disagree
- 4 Disagree
- 5 Strongly disagree

17. How willing would you be to share this card with a friend or family member?

On a scale of 1 to 5, with 1 being you would definitely share this card and 5 being you would definitely not share this card, would you...

- 1 Definitely share this card
- 2 Very probably share this card
- 3 Possibly share this card
- 4 Probably not share this card
- 5 Definitely not share this card

18. After viewing this message, how likely are you to call Sage to schedule a mammogram and Pap test in the next six months? On a scale of 1 to 5, with 1 being you will definitely call and 5 being you will definitely not call, will you...

- 1 Definitely will call
- 2 Probably will call
- 3 Don't know whether you will call
- 4 Probably will not call
- 5 Definitely will not call

19. If the offer (*point to the incentive insert card*) to get \$20 for having your mammogram through Sage were no longer available, how likely would you be to call our program to schedule your mammogram and Pap test? On a scale of 1 to 5, with 1 being very likely to 5 being not at all likely, would you be...

- 1 Extremely likely to call
- 2 Very likely to call
- 3 Moderately likely to call
- 4 Slightly likely to call
- 5 Not at all likely to call

20. Do you have any questions or comments about this card?

Great, thank you. Can I ask you a few last questions about your language use and culture?

Yes (*continue*)

No (*end survey*)

21. How long have you lived in the United States?

_____ (*number of years or year they moved here*)

22. Do you know the zip code in which you live? (*fill in if known- write city if not known*) _____

23. Have you gone to school at all?

Yes (*continue to 24*)

No (*skip to 25*)

24. Do you have: (*circle all that apply*)

No degree: *enter years of school attended* _____

High school degree

Associates degree (2-year college)

Bachelors/college degree

Other/higher degree _____

25. How well are you able to read English? On a 1 to 5 scale, with 1 being very well and 5 being not well at all, would you say you can read English...

1 Extremely well

2 Very well

3 Moderately well

4 Slightly well

5 Not well at all

26. How well are you able to read Hmong? On a 1 to 5 scale, with 1 being very well and 5 being not well at all, would you say that you can read Hmong...

- 1 Extremely well
- 2 Very well
- 3 Moderately well
- 4 Slightly well
- 5 Not well at all

27. Thinking about the language you use with most of your friends, is it usually...

- 1 Only Hmong
- 2 Mostly Hmong
- 3 Hmong and English equally
- 4 Mostly English
- 5 Only English

28. Thinking about the language you use with most of your neighbors (people that live on your block), is it usually...

- 1 Only Hmong
- 2 Mostly Hmong
- 3 Hmong and English equally
- 4 Mostly English
- 5 Only English

29. Thinking about the language you use at family gatherings, is it usually...

- 1 Only Hmong
- 2 Mostly Hmong
- 3 Hmong and English equally
- 4 Mostly English
- 5 Only English

30. Thinking about your close personal friends, are they...

- 1 Only Hmong
- 2 Mostly Hmong
- 3 Hmong and American equally
- 4 Mostly American
- 5 Only American

31. Thinking about your neighbors, are they...

- 1 Only Hmong
- 2 Mostly Hmong
- 3 Hmong and American equally
- 4 Mostly American
- 5 Only American

32. Thinking about the food you usually eat, is it...

- 1 Only Hmong
- 2 Mostly Hmong
- 3 Hmong and American equally
- 4 Mostly American
- 5 Only American

33. How much do you agree or disagree with the following statement: I think of myself as being American.

- 1 Strongly agree
- 2 Agree
- 3 Undecided – neither agree nor disagree
- 4 Disagree
- 5 Strongly disagree

34. How much do you agree or disagree with the following statement: Being American plays an important part in my life.

- 1 Strongly agree
- 2 Agree
- 3 Undecided – neither agree nor disagree
- 4 Disagree
- 5 Strongly disagree

35. How much do you agree or disagree with the following statement: I think of myself as being Hmong.

- 1 Strongly agree
- 2 Agree
- 3 Undecided – neither agree nor disagree
- 4 Disagree
- 5 Strongly disagree

36. How much do you agree or disagree with the following statement: Being Hmong plays an important part in my life.

- 1 Strongly agree
- 2 Agree
- 3 Undecided – neither agree nor disagree
- 4 Disagree
- 5 Strongly disagree

I want to tell you a little bit about our program and ask just a few last questions. The Sage Screening Program is a free statewide, comprehensive breast and cervical cancer screening program. Sage's main goal is to increase the number of women who are screened for breast and cervical cancer in Minnesota.

37. If this sounds like a program you may be interested in, I can see if you're eligible.
Are you interested?

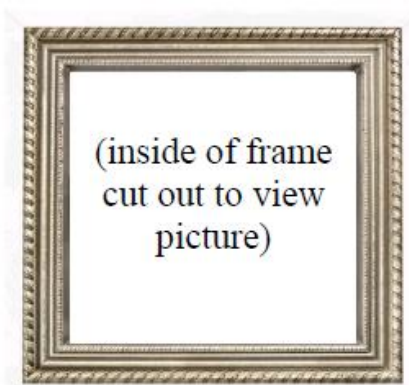
Yes, *GO TO TRACKING SHEET, try to sign woman up for upcoming event*

No (*end survey*)

Appendix B



Provided through your



The Robinsons
today

Tsev neeg
Robinsons

Take advantage of the Minnesota Department of Health's free breast and cervical cancer screening program.

It's easy. To learn more, or to schedule an appointment at a clinic near you, call Pa:

Siv Minnesota Department of Health's qhov program xoos fais fab kuaj mis thiab ncauj tsev me nyuam dawb.

Nws yooj yim. Zav paub ntxiv los yog xav teem sib hawm nrog rau ib lub tsev kho mob ze koj, hu rau Pa:

651-556-0689

to speak in Hmong or English
hais lus Hmoob los Askiv

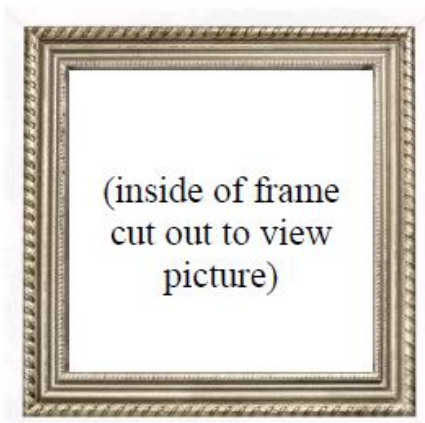


The Robinsons
eighteen months ago

Tsev Neeg Robinsons
18 hlis dhau los



Provided through your



The Vangs
today

Tsev neeg Hmoob
Vaj hnuv no

Take advantage of the Minnesota Department of Health's free breast and cervical cancer screening program.

It's easy. To learn more, or to schedule an appointment at a clinic near you, call Pa:

Siv Minnesota Department of Health's qhov program xoos fais fab kuaj mis thiab ncauj tsev me nyuam dawb.

Nws yooj yim. Zav paub ntxiv los yog xav teem sib hawm nrog rau ib lub tsev kho mob ze koj, hu rau Pa:

651-556-0689

to speak in Hmong or English
hais lus Hmoob los Askiv



The Vangs
eighteen months ago

Tsev Neeg Hmoob Vaj
18 hlis dhau los

Appendix C

Table 1: Age descriptive statistics

| <i>Min</i> | <i>Max</i> | <i>Mean</i> | <i>Std. dev.</i> |
|------------|------------|-------------|------------------|
| 30 | 80 | 53.84 | 11.56 |

Figure 1: Age distribution

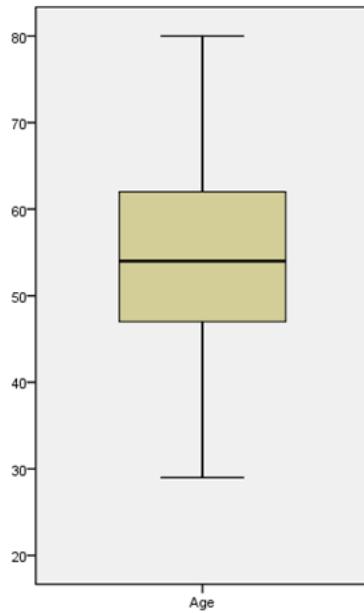


Table 2: Education descriptive statistics

| <i>Education level</i> | <i>%</i> |
|--------------------------------|----------|
| None | 56 |
| Some classes; no degree | 31 |
| High school degree | 9 |
| Associates | 0 |
| Bachelors | 4 |
| Other/higher | 0 |

Tables 3: Dependent variable descriptive statistics

| | <i>Yes</i> | <i>No</i> | <i>Refused/no answer</i> |
|-------------------------|------------|-----------|--------------------------|
| Interest in Sage | 38 | 24 | 14 |

Table 4: Dependent variables descriptive statistics

| | <i>Min</i> | <i>Max</i> | <i>Mean</i> | <i>Standard Deviation</i> |
|---------------------------|------------|------------|-------------|---------------------------|
| Intention to share | 1 | 5 | 2.64 | 1.02 |
| Intention to call | 1 | 5 | 2.74 | 1.03 |
| Message Evaluation | 1 | 5 | 3.10 | 1.25 |

Figure 2: Distribution of dependent variables

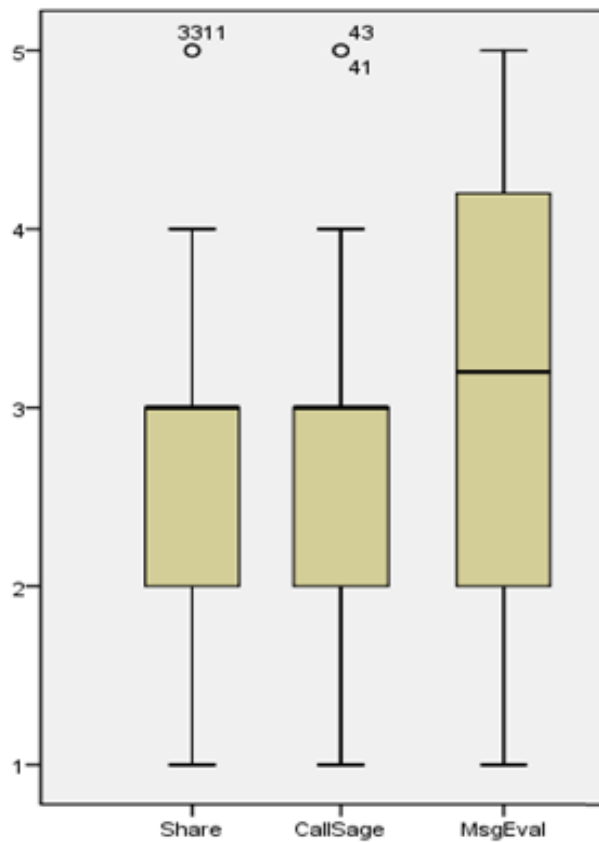


Table 5: Acculturation descriptive statistics

| | <i>Min</i> | <i>Max</i> | <i>Mean</i> | <i>Stnd. Dev.</i> |
|----------------------|------------|------------|-------------|-------------------|
| Acculturation | 2 | 5 | 4.63 | 0.76 |

Figure 3: Distribution of acculturation

