METAPHOR AS A COMMUNICATION STRATEGY FOR REDUCING HEALTH DISPARITIES FOR LATINA WOMEN

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A Thesis

presented to

the Faculty of the Graduate School

at the University of Missouri-Columbia

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In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

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by

MELISSA SPINA

Dr. Jamie Arndt, Thesis Supervisor

JULY 2016

The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

METAPHOR AS A COMMUNICATION STRATEGY FOR REDUCING HEALTH DISPARITIES FOR LATINA WOMEN

presented by Melissa Spina,

a candidate for the degree of master of arts,

and hereby certify that, in their opinion, it is worthy of acceptance.

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Professor Jamie Arndt

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Professor Dennis McCarthy

_____

Professor Lisa Flores

_____

Professor Laura Scherer

ACKNOWLEDGEMENTS

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Abstract

Racial and ethnic health disparities exist in a multitude of health domains, including higher incidence rates of cancer within minority populations and premature deaths associated with cancer. To address this problem, it has been suggested that health communication strategies incorporate a particular group's culture into the health message. The use of metaphor may be particularly well positioned to accomplish this. Metaphors help people understand abstract concepts (i.e., target concept) in more simplistic ways (i.e., source concept) by directly assimilating the more easily comprehended concept to the more complex one. Because Latinos value family, the present study examined the hypothesis that a metaphor describing the physical body as a family and cancer prevention as a mechanism to protect the familial body will increase interest and intentions in cancer prevention. Moreover, to the extent Latinas value family and a collectivistic orientation, the metaphor should engage these values to better predict intentions. Perceived susceptibility to and seriousness of cervical cancer as well as perceived barriers to and benefits of cancer prevention were examined as potential mediators. Results suggest the collective-family metaphor engages collectivistic and familial individual differences. Pap smear intentions increased the more collectivistic in orientation and the more Latinas valued familism when exposed to the metaphor message. Results also suggest the family metaphor indirectly increases Pap smear intentions through enhancement of perception of benefits of Pap smears, but only for Latinas who are less American acculturated or low in individualism. There exist some ambiguities in the results as well, with inconsistent findings across individual difference

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measures of Latino identification and values and different outcomes. Implications and

potential explanations are discussed.

Introduction

"Women! Mothers, daughters, sisters, friends, you matter! Get screened for breast cancer. A mammogram may save your life." This public health message highlights one of the contributing factors to the problem of racial health disparities in the United States (Smith, Cokkinides, & Brawley, 2012). Although many people from American culture benefit from this more typical individualistic framing of health communication aimed at empowering individuals to take responsibility for actions that affect their health, many people with differing cultural backgrounds, especially those of collectivistic orientations, may not (Inst. Med., 2002a; Inst. Med., 2002b). To the extent health communications can be an effective catalyst toward productive health behavior, it is imperative to design messages that account for cultural barriers to reduce racial health disparities.

One means to effectively assimilate an important health topic to an individuals' cultural value system can be through the use of metaphors. Metaphors provide a potentially useful strategy because they allow for the direct comparison of a complex topic (i.e., "target"), such as health or cancer screening specifically, to a more familiar and simplistic concept (i.e., "source"), such as a cultural value that may be especially important to a particular minority group (Gibbs, 1994; Kovecses, 2010; Lakoff & Johnson, 1980, 1999). Despite growing research in social psychology that attests to the power of metaphor to change attitudes and behavior, and health conditions having long been discussed in terms of metaphor, little if any research has explored the viability of using metaphor to change minority health attitudes. The present study investigated whether the use of metaphors in a health message could make a health topic more

culturally relevant to a minority group and thus promote more beneficial health attitudes and behavior.

Latino Health Disparities

Racial and ethnic disparities exist in a multitude of health domains, including higher incidence rates of cancer and premature deaths associated with cancer for minorities than for White individuals (Siegel, Ward, Brawley, & Jemal, 2011). For instance, African American, Latino, and American Indian/Alaskan Native women are diagnosed at later stages of breast cancer than Whites, at least in part because of neglecting to obtain critical Mammography screenings (Ward et al., 2004). This pattern of underutilization of cancer prevention among ethnic minorities is consistent across other screening-detectable cancers such as colorectal and cervical cancer, and is prevalent among Latinos.

Latinos are the largest and fastest growing minority population in the United States, accounting for 16.3% of the U.S. population in 2010 (Siegel, Naishadham, & Jemal, 2012). Compared to non-Hispanic whites, Latinos have higher incidence and mortality rates for stomach, liver, uterine cervix, and gallbladder cancer (Siegal et al., 2012). They also appear less likely to take advantage of screenings. Mammography and Papanicolaou (Pap) tests are important screenings in detecting breast and cervical cancer, respectively, at early stages of development and treatment (US Preventive Services Task Force, 2006), which substantially decreases mortality rates for these diseases (US Dept. HHS, 2000; Kerlikowske, Grady, Rubin, Sandrock, & Ernster, 1995; Shapiro, Venet, Strax, Venet, & Roeser, 1982; Tabar, Faberberg, Day, & Holmberg, 1987). Research indicates that Latinas had the lowest rates of mammography tests compared to both Black

and White women (Selvin & Brett, 2003) and that Latinas continue to receive screenings for breast and cervical cancer less often than White women (Adams, Breen, & Joski, 2006).

Although racial and ethnic health disparities are multiply determined (Siegal et al., 2012), there is evidence that cultural factors can play an important role (e.g., Kreuter & McClure, 2004). For example, underutilization of cancer prevention screenings and behavior is especially prevalent for less acculturated Latinos (Marks, Garcia, & Solis, 1990; Hu & Covell, 1986); that is, those who have not adopted the attitudes, values, and behavior of American culture (Suarez, 1994). This suggests it is important to consider cultural factors in the design of health messages intended to increase Latino attention to cancer prevention and screening.

Sociocultural Approach to Latino Health Communication: The Importance of Collectivism and Familism

Although there are multiple strategies for designing effective health communication, the sociocultural approach can inform the potential effectiveness of metaphor in promoting cancer prevention attitudes and behavior for the Latino minority group. The sociocultural strategy incorporates a group's culture into the health message by recognizing, reinforcing, and building upon a particular group's cultural belief system. In doing so, this strategy provides a familiar context to the health issue by constructing culturally relevant conceptualizations of the health topic (Resnicow, Baranowski, Ahluwalia, & Braithwaite, 1998). Thus, this approach is especially well-positioned to facilitate the transference of positive attitudes about one's culture to the health topic by merging a groups' culture with the health message (e.g., Campbell et al.,1999). For

example, Larkey and Gonzalez (2007) investigated the efficacy of culturally relevant storytelling for Latinos to promote colorectal cancer prevention intentions (e.g., consumption of vegetables, physical exercise, and colonoscopy screenings). They found this "storytelling" strategy motivated preventive intentions more than a numeric risk tool intervention that assessed participants' risk for all cancers, informed them of ways they could reduce their risk for colorectal cancer and the importance of screening for colorectal cancer. In particular, the culturally relevant storytelling method more effectively increased participant's intentions to include more vegetables in their daily diets, exercise, and recommend colorectal screenings to friends and relatives.

For the present study, two major facets of Latino culture were considered in designing a culturally relevant health message for this ethnic group. One of the most important aspects of Latino culture is the sense of collectivism or interdependence whereby human beings are primarily members of groups (Triandis, 1989). In this particular system, the needs of the group are prioritized above the needs of the individual. As such, the self and relationships are defined in terms of responsibilities for the individual that exist within a particular group for the group. One particular group that is of high importance in Latino culture is the family.

Familism (familismo) is defined as a social value whereby the family takes precedence over individual interests (Castex, 1994; Marin & Marin, 1991). Latinos often identify strongly with their family members, including extended family, and the needs of the family far surpass the needs of the individual (Reguero, 1991). The behaviors that are characteristic of familism can include: (1) obedience and respect towards authority

figures; (2) helpfulness, generosity, and loyalty towards the family; and (3) responsibility, hard work, and sacrifice for the family (Martinez, 1988).

Although there are many other aspects of Latino culture that are potentially important in designing culturally-relevant health messages (e.g., personalismo, Trevino, Moyer, Valdez, & Stroup-Benham, 1991; respeto, Arredondo et al., 1996; espiritism, Hovey, 1999; Samaan, 2000), the present study focuses on the collective-oriented familial component of Latino culture. Specifically, the present study aimed to incorporate this aspect of Latino culture into the health message to facilitate the transference of positive attitudes about the collective family onto the health topic. A metaphor was utilized as a tool to combine the health topic with the collective family to facilitate Latina persons to inject meaning into the health message and motivate cancer preventive attitudes and behavior.

Conceptual Metaphor Theory

Conceptual metaphor theory describes metaphor as a cognitive device that allows for the understanding of one idea in terms of a superficially dissimilar concept (Gibbs, 1994; Kovecses, 2010; Lakoff & Johnson, 1980, 1999). Often the idea people try to comprehend (i.e., "target") is abstract and difficult to understand while the dissimilar concept (i.e., "source) is more simplistic and reflects concrete experiences that are familiar, observable, and easily comprehensible. Thus, a metaphor that directly compares aspects of the source concept to analogous characteristics of the target concept facilitates transference of knowledge (e.g., attitudes, emotions) of the source onto the target concept. This allows for better comprehension of the target and can also change people's attitudes and thoughts about the relevant target concept (see Landau, Meier, & Keefer,

2010 for review). This process of direct comparison between a source and target is known as metaphoric framing.

Supporting the influence of metaphoric framing on attitude change and behavior, Thibodeau and Boroditsky (2011) demonstrated in several studies that participants who read a metaphor comparing city crime to a beast were more supportive of addressing crime via law enforcement (e.g., capture, enforce, punish) while individuals who were given a metaphor that described crime as a virus were more supportive of addressing the root cause of crime (e.g., reform, fixing the economy). This suggests that the source concept not only allows for different comprehension of the target concept, but that it can also directly influence the attitudes and preferences of the individual.

The effects of metaphoric framing have been found to extend to a number of different domains. For example, in a series of experiments, Landau, Oyserman, Keefer, and Smith (2014) found that college students who were primed with a journey-metaphoric framing in relation to their future academic identity were more likely to be proactive about their academic career (e.g., sign up for finals prep) than were individuals primed with containment-metaphoric framing and those without the metaphoric framing. Thus, these findings indicate that not only can metaphors influence cognitive linkages of distinct concepts, but that some metaphors (e.g., life as a journey) can motivate beneficial behavior (e.g., academic planning), while others (e.g., life as distinctly contained stages) have the potential to serve a limiting function.

Metaphor and Health

Metaphors have also been used extensively within health discourse generally and cancer discourse specifically (Reisfield & Wilson, 2004; Harrington, 2012; Willig, 2011).

Popular recognition of the role of metaphor began with Susan Sontag's book "Illness as Metaphor" (1978) where she describes the potential repercussions on cancer patients' experiences when using metaphors to describe cancer. More recently, attention has shifted to how metaphor can be viewed as a means to help patients better understand their diseases. For instance, often physicians will use metaphors, such as "war" (e.g., fight back against cancer; Hawkins, 1999), in order to efficiently help patients understand complex biological processes related to cancer and the multifaceted treatment process. However, with regard to the use of militant metaphors in describing cancer, some have suggested that it can have a negative effect on patients. For instance, war related terminology carries with it a sense of fearlessness that can undermine the ability for a patient to express their full range of emotions in relation to the disease (e.g., Byrne, Ellershaw, Holcombe, & Salmon, 2002; Donovan & Mercer, 2003). Although there is growing recognition that specific metaphors, such as the battle against cancer, might have both positive and negative effects, the broader recognition is that patients can rely on metaphors to help impose meaning and order in their lives, enabling them to feel in control of their illness and motivated to follow the prescribed treatment plan (Carter, 1989; Arroliga, Newman, Longworth, & Stoller, 2002).

In addition to allowing patients to better cope and understand their illness, metaphors can also have an impact on individual's health behavior and attitudes. For instance, simply framing the flu virus metaphorically (i.e., beast, riot, army, or weed) more effectively promoted flu vaccination intentions in general (Studies 1 and 3) and only for individuals who occasionally received the flu vaccine (Study 2) than framing the flu as a literal virus did (Scherer, Scherer, & Fagerlin, 2014). These findings indicate that

metaphorical framing can have an important impact on health decisions such as vaccination intentions. However, other research suggests that metaphors can have varying effects. For instance, Hauser and Schwarz (2014) found that when participants were exposed to the "cancer as an enemy metaphor" versus an "imbalance metaphor," this metaphoric framing lowered participants' intentions for self-limiting behaviors (e.g., quit smoking, reducing alcohol consumption). The researchers suggest many behaviors that reduce the risk of cancer require the individual to limit enjoyable activities (e.g., limiting imbibing at a social event). As such, this type of behavior aimed at protecting oneself from cancer does not necessarily correspond to "fighting an enemy". Although it has been debated whether an enemy metaphor in particular is appropriate for enhancing a patients' understanding and treatment for cancer (e.g., Reisfield & Wilson, 2004), these findings indicate that it also may not promote daily preventive behaviors. Thus, when designing health messages that utilize metaphors, it is important to consider the type of metaphor being used, the intended target audience, and the type of disease. So what then might inform the influence that particular metaphors can have on various health behaviors?

A concept known as "metaphoric fit" describes the process of metaphorically framing an abstract concept (e.g., depression) and "fitting" it to its corresponding metaphorically framed solution or treatment. In a series of experiments, Keefer, Landau, Sullivan, and Rothschild (2014) examined the effectiveness of metaphorically framing a treatment (i.e., anti-depressants) to the corresponding metaphorically framed disease (i.e., depression). For instance, in one study they found that when the disease was framed as keeping the person "down", participants were more likely to endorse a metaphorically

framed treatment as "lifting" the person's mood than a non-metaphorically framed treatment or a treatment metaphorically framed as "illuminating." But participants preferred the "illuminating" treatment when depression was framed as "dark". Thus, when metaphorically framing a solution, such as cancer prevention, it is best to frame the solution in such a way that it matches the corresponding metaphorically framed problem (i.e., cancer), and can productively draw from associated values of the individual.

Present Study

The present study addressed the question of whether a metaphor describing the physical body as a family and cancer prevention as protecting the family would be a feasible culturally relevant health message for promoting cancer prevention intentions and attitudes for Latinas. For the scope of this project, the study assessed whether this method was effective in promoting Pap smear screening intentions in particular. The concept of family was used in the health message because of its importance within Latino culture. The health message was hypothesized to promote more positive attitudes and intentions to obtain Pap smear screenings.

When Might (a familial) Metaphor be Especially Effective

However, such (collective-familial) metaphors may not be universally effective for all Latinas. The effectiveness may depend on the extent to which the metaphor taps into values that are endorsed by the individual. For example, in the context of the present study, a metaphor oriented toward collective-familial values might be most effective at promoting cancer-screening intentions when presented to Latinas who are more collectivistic and who strongly value familism. Specifically, the familial metaphor was predicted to activate the importance of collectivism in the context of the family and thus

was predicted to be effective at promoting cancer screening intentions the more collective in orientation Latinas were and the more strongly they identified with the familism value.

Similar reasoning might also apply to different dimensions of acculturation. That is, because the metaphor health message incorporated more traditional Latino values (e.g., collectivism, familism) and less American-related values (e.g., individualism), Latinas who are high in Hispanic acculturation or low in American acculturation might benefit more from a Latino culturally-tailored health metaphor. Along this line of reasoning, Latinas who are highly American acculturated or less Hispanic acculturated might not benefit from the collective-familial framed metaphor message.

The study also examined the potential for ethnic group identity, or the extent to which individuals strongly identify with their ethnic group, to influence the effectiveness of the metaphor health message in promoting cancer screening intentions.

How Might Metaphors Influence Behaviors/Intentions

The present study is guided by the hypothesis that metaphors assimilating cancer prevention with collective-familism may capitalize on relevant individual differences to promote cancer prevention intentions and attitudes. To understand the process through which such effects might emerge, the present study also examined a number of potential mediators. Constructs derived from the health belief model (HBM; Hochbaum 1958, Champion 1999, Gozum & Aydın 2004, Reynolds et al. 2007, Johnson, Mues, Mayne, & Kiblawi, 2008) may be useful in this regard. According to this model, health behavior is influenced by the perception of one's susceptibility to and seriousness of a health threat (e.g., cervical cancer) as well as the perceived barriers and benefits of a prevention strategy (e.g., Pap smears) to minimize the health threat.

Thus the present study examined whether the underlying cognitions of the HBM (i.e., susceptibility, seriousness, barriers, and benefits) involved in motivating intentions for cancer prevention were activated by the particular health message used in the study, particularly given the individuals' level of collectivism, familism, and acculturation. Notably, although research indicates such cognitions are often involved in health behavior change, some research suggests that health (i.e., flu) metaphors do not affect similar types of mediating perceptions (Scherer et al., 2014; perceived risk, severity, affect, control, and understanding). Thus, predictions are tentative as to whether the metaphor can impact these mediating cognitions to affect screening intentions at certain levels of individual differences. In addition, for exploratory purposes, accuracy of Pap smear and cervical cancer knowledge was measured as a potential mediator.

Method

Sample and Design

The present study used a 2 level (metaphor vs. non-metaphor message) between-subjects design. 183 Latina women age 21 and over (M=30.58, SD=10.62) were recruited from the University of California (UC), Merced (n=35), via a multi-university psychology department listserv announcement to universities with high Latina populations (n=54), and from a panel maintained by Qualtrics (Qualtrics, Provo, UT; n=94)[1]. The rationale for recruiting only women who are age 21 and over is because the recommended frequency of getting a Pap smear for women begins at age 21 and continues thereafter every 3 years (SmCith et al., 2012). Other demographic characteristics of the overall sample include ethnic generation (26.8% 1st generation; 40.4% 2nd generation; 7.7% 3rd generation; 9.8% 4th generation; 9.8% 5th generation; 5.5% unsure), education level (2.1% no high school diploma; 19.1% high school diploma; 38.3% some college or associate or technical degree; 24.6% bachelor's degree; 15.8% advanced degree), income level (27.3% less than $24,999; 42.6% $25,000-$49,999; 24% $50,000-$99,999; 5.5% $100,000 or more), primary language (English 72.7%; Spanish 27.3%), number of sexual partners (M=5.38), and health insurance (Yes 85.2%; No 14.8%).

The original proposed sample size of 200 was determined using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009) for an ANOVA with four groups, numerator df=10, Power=.95, and effect size f=.25 (medium effect size). The effect size was determined by aggregating the effect sizes from several publications regarding metaphoric framing and

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[1] Qualtrics Panel excluded participants who did not complete the entire survey prior to submitting the data file to the experimenters of the study.

attitude change (i.e., Landau, Sullivan, & Greenberg, 2009; Morris, Sheldon, Ames, & Young, 2007; Scherer et al., 2014). Because of difficulties with recruitment, the obtained sample size was just short of the number recommended by the power analysis. Of the 183 Latina women who were recruited, we excluded those who were under the age of 21 (n=1), listed themselves as multiracial (n=13), or had received 20 Pap smears in the past five years (n=1). The reason for excluding Latinas who were multiracial was so that responses could be more confidently tied to either Latino or American culture. The rationale for excluding the participant who had received 20 Pap smears in the past five years was because this seemed like an exceptional amount to obtain given the suggested frequency is once every three years for women 21 years of age and older.

Prior to completing the survey, participants completed a screening survey on Qualtrics (Qualtrics, Provo, UT) to ensure they met the specified criteria noted in the recruitment ad. Participants completed an online survey containing all of the materials through Qualtrics software (Qualtrics, Provo, UT) in English and were told that the study investigated people's perceptions of health issues. Participants recruited from the listserv or UC Merced were compensated by being entered into a raffle drawing to win one of four $50 Visa giftcards or with extra credit in their psychology courses at their instructor's discretion. Participants recruited from the Qualtrics Panel were from a variety of sources (e.g., random surveys taken at local and corporate businesses), specifically unknown to the researchers and thus were compensated by Qualtrics Panel with a variety of methods (e.g., giftcard to favorite store, cash).

Materials and Procedure

The study administered abbreviated versions of several measures (described below) in the interest of minimizing participant burden and maximizing complete responses to the materials. All materials are presented in Appendix A.

Bidimensional Acculturation Scale. Participants responded to 24 items from the Bidimensional Acculturation Scale for Hispanics (Marin & Gamba, 1996; American acculturation subscale α=.88; Hispanic acculturation subscale α=.96), which assesses the extent to which Latinos are acculturated to American culture (e.g., "How often do you speak in English?") and Hispanic culture (e.g., "How often do you speak in Spanish?") on a 4-point Likert-type scale (e.g., *1*=Never *4*=Often).

Religion Scale. Participants rated their level of agreement to 3 items from the Religion Subscale of the Mexican American Cultural Value Scale (Knight et al., 2009; α=.94), which assesses individuals' level of religiosity (e.g., "It is important to follow the Word of God.") on a 5-point Likert-type scale (e.g., *1*=Not at all, *5*=Completely).

Cultural Orientation Scale. Participants rated their agreement with 8 items from the Cultural Orientation Scale (Triandis & Gelfand, 1998; collectivism α=.64; individualism α=.63) on a 9-point Likert-type scale (i.e., *1*=Never or definitely no, *9*=Always or definitely yes) consisting of four subcategories (two items per category) of cultural orientation. This scale assesses participants' level of collectivism and individualism relative to their perception of inequality (i.e., vertical) or equality (i.e., horizontal). However, because current hypotheses only pertained to individualism (e.g., "I'd rather depend on myself than others.") or collectivism (e.g., "It is my duty to take care of my family, even when I have to sacrifice what I want.") more broadly, only these two general subscales were considered in the present study.

Attitudinal Familism Scale. Participants completed 8 items from the attitudinal familism scale (Steidel & Contreras, 2003; α=.80) on a 10-point Likert-type scale ranging from 1 (*strongly disagree*) to 10 (*strongly agree*). Although the scale contains subscales for different aspects of familism (e.g., subjugation of self for family), current hypotheses only pertained to overall levels of familism (e.g., "A person should respect his or her older brothers and sisters regardless of their differences in views." "A person should live near his or her parents and spend time with them on a regular basis.").

The Multigroup Ethnic Identity Measure. Participants completed items from the multigroup ethnic identity measure (Phinney, 1992; α =.78), which assesses the extent to which an individual identifies with their particular ethnicity and ethnic group. Participants responded to 7 statements (e.g., "I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs.") on a 4-point Likert-type scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*).

Additional Individual Difference Measures. Additional measures were included for exploratory purposes as well as serving as distractor tasks to reduce the likelihood that responses to the familism, acculturaltion, and ethnic identity measures would influence participants' perceptions of the manipulation. These measures included 7 items from the Maximizer scale (Scherer et al., 2014; α=.84) assessing participants' tendency to seek out active medical interventions for all medical ailments (e.g., "When it comes to medical treatment, more is usually better."). Participants rated their agreement with each item on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Participants also responded to 5 items from the Social Desirability Scale short form A (Reynolds 1982; Crown & Marlow, 1960; α=.54), 3 items from the Rational subscale of

the Rational Inventory (Norris & Epstein, 2011; $\alpha =.14$), 2 items from the Imagination subscale of the Experiential Inventory (Norris & Epstein, 2011; $\alpha=.58$), and two questions assessing their health literacy on 5-point Likert-type scales adapted from Morris, MacLean, Chew and Littenberg (2006) and Wallace, Rogers, Roskos, Holiday, and Weiss (2006) ($\alpha=.58$).

 Cancer Message. Participants were asked to read some basic information about what a Pap Smear Test is (e.g., "It is performed by most healthcare providers during a gynecologic checkup; If detected early, cervical cancer can be cured…"). Then participants were given a health message and were asked to answer some questions that followed the message. Participants were randomly assigned to read a metaphoric message that read:

> "***Why should you get a Pap Smear?***
>
> One way to consider this question is to think about the connection between your body and a family. You know that a family is made up of lots of people, like a father, mother, children, aunts, uncles, cousins, and grandparents. And you know that what keeps a family strong is that they all work together and depend on each other. When each family member is cared for, a family is stronger as a whole. Your body works in the same way. It is made up of many parts that all work together. Like a family, they communicate back and forth and rely on each other to keep your body well. So you can think about it like this: Getting a Pap Smear every three years is like making sure that a member of your family is cared for. And that's what it takes to keep the whole "family" of your body healthy, safe, and strong for years to come."

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or a non-metaphoric message that read:

"***Why should you get a Pap Smear?***

One way to consider this question is to think about the connection between the parts of your body. You know that a body is made up of many organs, like a heart, brain, kidneys, liver, stomach, lungs, and pancreas. These organs belong to what are called *body systems*. You may have heard of the digestive system, respiratory system, and circulatory system. Others include the endocrine and lymphatic systems. What keeps the body healthy is when all those systems function properly, and that depends on each organ being healthy. For example, in your circulatory system, blood is pumped by the heart, cleaned by kidneys, and receives chemicals from the pancreas. So you can think about it like this: Getting a Pap Smear every three years is one way to make sure that a part of your body is healthy. And that's what it takes to keep body systems functioning properly and your whole body healthy, safe, and strong for years to come."

Cancer Screening Intentions and Interest. Participants responded to a number of questions to gauge their interest and intentions with regard to Pap Smears. Participants were asked four questions regarding their intentions to receive a Pap Smear Test adapted from Jennings-Dozier (1999) and Kahn, Goodman, Slap, Huang, and Emans (2001) ("Do you plan to get a Pap Smear Test in the coming year; how often in the future do you intend to receive a Pap Smear Test?"; "How sure or unsure are you that you will get a Pap Smear Test every three years?"; "Please rate your intentions to obtain a Pap Smear Test every three years") on 5-point Likert-type scales (e.g., *1*=Definitely not, *5*=Definitely; α=.73). Additionally, participants were asked three questions to gage their

interest in learning more about Pap smears and being contacted with more information (e.g., "How interested are you in learning more about the benefits of Pap Smear Tests in detecting cancer early?"; α=.90) on 5-point Likert type scales (e.g., *1*=Not at all; *5*=Extremely) and how likely they were to recommend getting a Pap smear to their female friends and family members (*1*=Not at all likely, *5*=Extremely likely). They were then asked to imagine that their insurance does not cover a screening or that they don't have health insurance and to rate how much they would be willing to pay out-of-pocket for a Pap Smear Test on a scale from 0 to 200 dollars.

Pap Smear and Cervical Cancer Perceptions.

Participants responded to 11 items (with the highest item-total correlations) from the Health Belief Model (HBM) Scale for Cervical Cancer and Pap Smear Test (Guvenc, Akyuz, & Acikel, 2010), a 35-item scale which assesses 5 facets of the HBM in relation to Pap Smear Tests and cervical cancer. Responses were recorded on a 5-point Likert-type scale ranging from 1(*Strongly disagree*) to 5 (*Strongly agree*). The items included targeted perceived: benefits of Pap Smear Tests (e.g., "I think that having a regular Pap Smear Test is the best way for cervical cancer to be diagnosed early.") and health motivation (e.g., "I want to discover health problems early"; α=.88); perceived barriers to Pap Smear Tests (e.g., "I am afraid to have a Pap Smear Test because I don't know what will happen."; α=.84); perceived seriousness of cervical cancer (e.g., "I am afraid to think about cervical cancer."; α=.83); perceived susceptibility to cervical cancer (e.g., "My chances of getting cervical cancer in the next few years are high."; α=.87).

Fatalism Measure. Participants were asked to respond to two statements adapted from the Powe Fatalism Inventory (Powe, 1995; α=.69), a 13-item measure that assesses

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people's fatalism beliefs about cancer (e.g., "I believe if someone is meant to get cancer, they will get it no matter what they do"). Additionally, participants responded to a statement regarding their beliefs about the relationship between cancer and death (Moser et al., 2014; "When I think of cancer, I automatically think of death.") Responses were recorded on a 5-point Likert-type scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*). Given that one aspect of Latino culture is the notion that people do not have control over their future or fatalismo (Baquet & Hunter, 1995), this Latino belief could influence participants' intentions to receive Pap Smear screenings as well as responses to the four facets of the HBM (Guvenc et al., 2010). Thus the fatalism measure was included as a potential covariate. The item assessing participants' perceptions of the relationship between cancer and death was also included as a potential covariate.

Pap Smear and Cancer Beliefs. Participants were asked to respond to 11-items as being true or false regarding their personal beliefs about Pap smears and cancer (e.g., "You can tell if someone has cervical cancer"; FernaÂndez-Esquer, Espinoza1, Ramirez & McAlister, 2003; α=.23) to assess whether the message was effective in promoting accurate beliefs about Pap smears and cancer. This measure was included as a potential mediator for the Pap smear intentions and interest outcome variables.

Personal and Family History. Participants were asked to answer 9 questions regarding their personal and family history of cervical and other cancers, Pap smear results, how many times they received a Pap smear in the last 5 years (FernaÂndez-Esquer et al., 2003), and if they have ever had an HPV test.

Demographics. Participants were asked to respond to a number of demographic questions (i.e., age, sex, race/ethnicity, highest level of education, income level) as well

as their ethnic origin (i.e., Mexican, Puerto Rican, Cuban, Dominican), Latino-American

generation (e.g., 1st, 2nd, 3rd), whether they have health insurance and if it covers a Pap

smear procedure, number of sexual partners they have had, and primary language.

Results

Analyses were guided by the two focal hypotheses. The first hypothesis was that a family-based metaphor, relative to a non-metaphorical message, would increase Pap smear intentions (Pap smear screening intentions, interest in learning about Pap smears, intentions to recommend Pap smears to female friends and family, and amount willing to pay for a Pap smear). This hypothesis was assessed via 2-condition (metaphor vs. non-metaphor) Analyses of Variance (ANOVA). The second hypothesis was that, after exposure to the family metaphor message (relative to no metaphor), individual differences in cultural and ethnic values (American acculturation, Hispanic acculturation, collectivism, individualism, familism, and ethnic identity) would more strongly predict Pap smear intentions. This hypothesis was examined with multiple regression analyses. Following Aiken and West (1991), for all 2-way interactions of message x moderator, the moderators were mean centered, the message variable dummy coded, and the interaction term of moderator x message was computed. Main effects of message and moderator were included with the interaction term in a regression model. In addition, analyses also considered whether the metaphor message either by itself or in conjunction with individual differences in cultural values predicted perceptions of Pap Smears and cervical cancer (perceived benefits of Pap smear, perceived seriousness of cervical cancer, perceived susceptibility to cervical cancer, perceived barriers to Pap smears, and accuracy of Pap smear and cervical cancer knowledge).

In the interest of fully understanding the data, all significant and trending effects were explored. In the event of marginal to significant effects ($p \leq .10$) on Pap smear and cervical cancer perceptions (i.e., potential mediators), moderated meditational analyses

were examined for outcome variables that were predicted by the perception variables in a separate simple regression analysis (p≤.10) (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Rucker, Preacher, Tormala, & 2011). Bivariate correlations for the above (continuous) variables are reported in Table 1.[2]

The effects of familial metaphor on Pap smear intentions and perceptions

Two-condition (metaphor vs. non-metaphor message) ANOVAs on the four measures of Pap Smear intentions and interest, and the five measures of perceptions of Pap Smears and cervical cancer, revealed no significant effects (all *p's*>.25).

The effects of Latino values and familial metaphor on Pap smear intentions and perceptions

Collectivism

Pap Smear Intentions and Interest. Multiple regression analyses examined the interaction between metaphor condition and collectivism on outcome variables (i.e., Pap smear intentions, interest in learning about Pap smears, intentions to recommend Pap smears to others, amount willing to pay for Pap smears). These analyses revealed no effects on intentions to recommend or amount willing to pay (all *p*s>.36). However, there was a main effect of collectivism (b=.228, SE_b=.050, β=.334, *p*<.001) and a significant interaction between message and collectivism (b=.108, SE_b=.050, β=.158, *p*=.031) on Pap Smear intentions (see Figure 1)[3]. Examination of simple slopes showed that when presented with the family metaphor, collectivism positively predicted stronger Pap smear

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[2] The medical-maximizing variable is also included in the table given the interests of the committee.
[3] Predicted value comparisons revealed that at low levels of collectivism (-1 SD below the mean), there were marginally weaker Pap smear intentions when presented with the metaphor message than the non-metaphor message (b=.309, SE_b=.160, β=.198, *p*=.055). No differences emerged at high (+1 SD) levels of collectivism (b=.-.184, SE_b=.160, β=-.118, *p*=.253).

intentions (b=.336, SE$_b$=.071, β=.491, p<.001). However, this relationship was weaker

when presented with the non-metaphor message (b=.120, SE$_b$=.070, β=.176, p=.087).

There was also a main effect of collectivism on interest in learning about Pap

smears (b=.292, SE$_b$=.083, β=.262, p<.001) and the interaction between collectivism and

message on interest in learning about Pap smears approached significance (b=.137,

SE$_b$=.083, β=.123, p=.101; see Figure 2).[4] Examination of simple slopes showed that in

the metaphor condition, higher levels of collectivism predicted stronger interest in

learning about Pap smears (b=.429, SE$_b$=.118, β=.385, p<.001). This relationship was

weaker in the non-metaphor condition (b=.154, SE$_b$=.117, β=.139, p=.188).

Pap smear Perceptions and Beliefs. Multiple regression analyses found no

collectivism by message interactions on perceived benefits of Pap smears, barriers to Pap

smears, accuracy of Pap smear and cervical cancer knowledge, or perceived susceptibility

(all ps>.12). However, there was a marginal interaction between message and

collectivism on perceived seriousness of cervical cancer (b=.133, SE$_b$=.080, β=.128,

p=.096) (see Figure 3).[5] When presented with the family metaphor, higher collectivism

predicted stronger perceptions of seriousness of cervical cancer (b=.316, SE$_b$=.113,

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[4] No significant effects were found with predicted value comparisons of message at high and low levels of collectivism.
[5] Predicted value comparisons revealed that at high levels of collectivism (+1 SD above the mean), participants indicated marginally greater perceived seriousness of cervical cancer when presented with the metaphor message than the non-metaphor message (b=.440, SE$_b$=.257, β=.185, p=.088). Predicted value comparisons for message type did not reach significance at low values of collectivism (b=.169, SE$_b$ =.257, β=.071, p=.510).

β=.303, *p*=.006). However, this relationship was not observed when presented with the

non-metaphor message (b=.049, SE_b=.112, β=.047, *p*=.660).

Hayes' (2012) PROCESS macro[6] was used to examine moderated mediation

analyses (Preacher, Rucker, & Hayes, 2007) for the conditional indirect effects of

metaphor message on Pap smear intentions, interest in learning about Pap smears,

willingness to recommend Pap smears to others, and amount willing to pay for a Pap

smear through perceived seriousness of cervical cancer at three values of collectivism:

the mean (7.56), one standard deviation above the mean (8.70), and one standard

deviation below the mean (6.42). Bootstrap confidence intervals (CI's) indicated none of

the conditional indirect effects was significantly different from zero for all of the above

outcome variables.

Individualism

Pap Smear Intentions and Interest. Multiple regression analyses examining the

metaphor by individualism interaction on the outcome variables (i.e., Pap smear

intentions, interest in learning about Pap smears, intentions to recommend Pap smears to

others, amount willing to pay for Pap smears) revealed no significant effects (all *p*'s>.12).

Pap smear Perceptions and Beliefs. Multiple regression analyses examined

whether there were individualism x message interactions on endorsement of benefits of

Pap smears, seriousness of cervical cancer, susceptibility to cervical cancer, barriers to

Pap smears, accuracy of Pap smear and cervical cancer knowledge. These analyses

revealed a marginal interaction between message and individualism on perceived benefits

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[6] All moderated mediation models were analyzed using Hayes (2012) SPSS PROCESS macro sampling
with replacement at 1,000 bootstrap samples.

(b=-.070, SE$_b$=.038, β=-.143, *p*=.068; all other ps>.12) (see Figure 4).[7] Examination of

simple slopes analyses revealed no significant effects (all *p*'s>.12).

Moderated mediation analyses (Preacher et al., 2007; Hayes 2012) examined the

conditional indirect effect of metaphor message on the different outcome variables of Pap

smear intentions, interest in learning about Pap smears, willingness to recommend Pap

smears to others, and amount willing to pay for a Pap smear through benefits of Pap

smears at three values of individualism (see Table 2): the mean (6.56), one standard

deviation above the mean (7.87), and one standard deviation below the mean (5.25).

Bootstrap CI's indicated one of the three conditional indirect effects was positive and

significantly different from zero for Pap smear intentions and interest in learning about

Pap smears, but not for recommendation intentions and amount willing to pay for Pap

smears. These analyses indicate that the indirect and positive effect of the family

metaphor message on Pap smear intentions and interest in learning about Pap smears

through benefits was observed when levels of individualism were low, but not when

individualism levels were moderate to high. This suggests that at low levels of

individualism the metaphor message increased perceived benefits of Pap smears relative

to the non-metaphor message, which in turn increased intentions and interest in learning

about Pap smears.

Familism

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[7] Predicted value comparisons revealed that at low levels of individualism (-1 SD below the mean),
participants indicated marginally stronger agreement with benefits of Pap smears when presented with the
metaphor message than the non-metaphor message (b=.237, SE$_b$=.139, *β*=.187, *p*=.089). The comparison
between type of message at high levels of individualism was not significant (b=.127, SE$_b$=.141, *β*=.100,
p=.368).

Pap Smear Intentions and Interest. Multiple regression analyses examining the metaphor by familism interaction on Pap smear intentions, interest in learning about Pap smears, intentions to recommend Pap smears to others, and amount willing to pay for Pap smears revealed a main effect of familism (b=.085, SE_b=.040, β=.164, p=.036) and a significant interaction on Pap smear intentions (b=.081, SE_b=.040, β=.156, p=.046; all other p's>.46) (see Figure 5).[8] Examination of simple slopes showed that when presented with the family metaphor, higher levels of familism predicted stronger Pap smear intentions (b=.165, SE_b=.050, β =.321, p=.001). However, this relationship was not evident with the non-metaphor message (b=.004, SE_b=.063, β=.008, p=.948).

Pap smear Perceptions and Beliefs. Multiple regression analyses examining the interaction between metaphor and familism on benefits of Pap smears, seriousness of cervical cancer, susceptibility to cervical cancer, barriers to Pap smears accuracy of knowledge of Pap smears and cervical cancer revealed a main effect of familism (b=-.188, SE_b=.069, β=-.212, p=.007) and a significant interaction on accuracy of Pap smear and cervical cancer knowledge (b=.147, SE_b=.069, β=.165, p=.036; all other p's>.40) (see Figure).[9] Examination of simple slopes revealed that when presented with the non-metaphor message, higher levels of familism predicted lower accuracy of Pap smear and

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[8] Predicted value comparisons revealed that at low levels of familism (-1 SD below the mean), participants indicated marginally weaker intentions when presented with the metaphor message than the non-metaphor message (b=.312, SE_b=.169, β=.200, p=.066). Predicted value comparisons between type of message at high levels of familism were non-significant (b=-.177, SE_b=.169, β=-.114, p=.297).

[9] Predicted value comparisons revealed no significant differences between type of message at low and high levels of familism (all p's>.11).

cervical cancer knowledge (b=-.335, SE_b=.109, β=-.377, *p*=.002). No relationship was

evident in the metaphor message condition (b=-.042, SE_b=.086, β=-.047, *p*=.626).

Moderated mediation analyses (Preacher et al., 2007; Hayes, 2012) examined the

conditional indirect effect of metaphor message on the different outcome variables of Pap

smear intentions and willingness to recommend Pap smears to others through accuracy of

knowledge of Pap smears and cervical cancer at three values of familism (see Table 3):

the mean (6.87), one standard deviation above the mean (8.38), and one standard

deviation below the mean (5.35). Bootstrap CI's indicated one of the three conditional

indirect effects (based on moderator values at the mean, 1 standard deviation below, and

1 standard deviation above) was negative and significantly different from zero for Pap

smear intentions, but not for recommendation intentions. These analyses indicate that the

indirect and negative effect of the family metaphor message on Pap smear intentions

through accuracy was observed when levels of familism were low, but not when familism

levels were moderate to high. This suggests that at low levels of familism the metaphor

message decreased accuracy of Pap smears and cervical cancer relative to the non-

metaphor message, which decreased Pap smear intentions.

American Acculturation

Pap Smear Intentions and Interest. Multiple regression analyses examined the

interaction between American acculturation and metaphor condition on the outcome

variables (i.e., Pap smear intentions, interest in learning about Pap smears, intentions to

recommend Pap smears to others, amount willing to pay for Pap smears). No significant

effects emerged (all *p*'s>.27).

Pap smear Perceptions and Beliefs. Multiple regression analyses on Pap smear

perceptions and beliefs revealed no interactive effects on seriousness of cervical cancer,

susceptibility to cervical cancer, barriers to Pap smears, accuracy of Pap smear or

cervical cancer knowledge (all *ps>.18*). However, the interaction between message and

American acculturation on perceived benefits of Pap smears was significant (b=-.348,

SE_b=.140, β=-.191, p=.014) (see Figure 7)[10]. Examination of simple slopes showed that

when presented with the family metaphor, lower levels of American acculturation

predicted marginally stronger agreement with benefits of Pap smears (b=-.324, SE_b=.191,

β=-.179, *p*=.090). However, in the non-metaphor condition, lower levels of American

acculturation predicted marginally weaker agreement with benefits of Pap smears

(b=.371, p=.205, β=-.137, *p*=.072).

Moderated mediation analyses (Preacher et al., 2007; Hayes, 2012) examined the

conditional indirect effect of metaphor message on the different outcome variables of Pap

smear intentions, interest in learning about Pap smears, willingness to recommend Pap

smears to others, and amount willing to pay for a Pap smear through perceived benefits of

Pap smears at three values of American acculturation (see Table 4): the mean (3.78), the

maximum (4.00)[11], and one standard deviation below the mean (3.43). Bootstrap CI's

indicated one of the three conditional indirect effects was positive and significantly

different from zero for all of the above outcome variables. The indirect and positive

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[10] Predicted value comparisons revealed that at low levels of American acculturation (-1 SD below the mean), participants endorsed more benefits of Pap smears when presented with the metaphor message than the non-metaphor message (b=-.313, SE_b=.138, *β*=-.247, *p*=.024). Predicted value comparisons for message type did not reach significance at high values of American acculturation (b=.173, SE_b =.138, *β*=.137, p=.211).
[11] Hayes' (2012) PROCESS macro automatically generates results for the maximum (or minimum) values of a moderator if +1 SD (or -1SD) is outside of the range possible of values.

effect of the family metaphor message on the above outcome variables through perceived

benefits was observed when levels of American acculturation were low, but not when

American acculturation levels were moderate to high. This suggests that at low levels of

American acculturation the metaphor message increased perceived benefits of Pap smears

relative to the non-metaphor message, which in turn increased intentions, interest in

learning about Pap smears, intentions to recommend Pap smears to others, and amount

willing to pay for Pap smears.

Hispanic Acculturation and Ethnic Identity

　　　Similar analyses were conducted with Hispanic acculturation and ethnic identity

as the moderators. However, none of these analyses were significant (all p's>.11)[12].

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[12] We have not yet fully examined exploratory analyses of Religion, Experientalism/Rationalism, and Health Literacy as moderators. However, preliminary analyses for the religion subscale revealed message x religion interaction on Pap smear intentions and a marginal interaction effect on benefits of Pap smears. No other analyses yielded effects that approached significance. Because of the interests of the committee, we note that multiple regression analyses examined whether the effect of message on benefits of Pap smears, seriousness of cervical cancer, susceptibility to cervical cancer, perceived barriers to Pap smears, accuracy of Pap smear and cervical cancer knowledge depends on the level of medical maximizing. These analyses revealed a marginal main effect of maximizing (b=.108, SE_b=.063, β=.135, p=.086) and a marginal interaction between maximizing and message on barriers to Pap smears (b=.107, SE_b=.063, β=.132, p=.092; all other p's>.27). Predicted value comparisons revealed no marginal or significant effects between type of message for high or low levels of maximizing (all p's>.10). Further, examination of simple slopes showed that when presented with the family metaphor message, high maximizing predicted greater perceptions of barriers to Pap smears (b=.215, SE_b=.080, β=.267, p=.008) but no relationship was evident when presented with the non-metaphor message (b=.002, SE_b=.097, β=.002, p=.985).

Discussion

The goal of this study was to assess whether a metaphor describing the physical body as a family would be a viable tool in the context of a health message to promote Pap smear cancer screening intentions for Latinas. Past research suggests that metaphors facilitate the transference of knowledge about a simpler, more familiar concept (e.g. protecting the family) to a more complex, difficult to understand concept (e.g. protecting the body; see Landau et al., 2010 for review). The health message used in this study thus described the physical body (i.e., target) in terms of how a family functions (i.e. source) to facilitate the transference of attitudes and emotions about one's family to one's body. This process was hypothesized to promote the importance of protecting the "familial body" from cancer and enhance Latinas' intentions to receive a Pap smear.

The present study provides some evidence to support this process, but only when the metaphor engaged individual differences relevant to the content of the message. Specifically, the collective-familial metaphor appeared to effectively engage collectivistic and familial individual differences. As Latinas reported being more collectivistic and having stronger familial values, the stronger their intentions were to get a Pap smear when exposed to the metaphor message. Presumably this occurred because the collective-familial metaphor was more relevant to these characteristics and thus these individual differences were engaged by this type of message to promote Pap smear intentions.

Further evidence in support of this process occurred when considering American acculturation and individualism. Although the metaphor did not interact with these individual differences to directly affect intentions, the Latino culturally-relevant metaphor enhanced perceptions of the benefits of receiving a Pap smear (e.g., catching

cervical cancer early) for Latinas to whom American culture is less relevant and those low in individualism. Interestingly, the relationship between the metaphor message and perceptions of benefits at low levels of individualism and American acculturation in turn enhanced participants' intentions to receive a Pap smear.

Other evidence suggests that the metaphor may be detrimental to those for whom it is not relevant. Results show that for Latinas who have weak familial values, the metaphor, relative to the non-metaphor, decreased accuracy of knowledge about Pap smears and cervical cancer which in turn decreased intentions to receive a Pap smear. This suggests metaphor may actually have the potential to confuse health information when presented to those for whom it is less relevant, perhaps leading to a harmful effect (i.e. reducing screening intentions).

This pattern of metaphor engaging individual differences that are most relevant is consistent with other research suggesting that metaphors may be differentially effective depending on whether they engage pertinent characteristics of the individual. For example, recent research has found that metaphors describing the sun as an enemy increased sun protection intentions among individuals who were especially likely to fear enemy combatants (Landau, Arndt, & Cameron, in preparation). The present study builds on such research to support the notion that the effectiveness of health metaphors is contingent on its engagement with relevant individual characteristics and can be less useful to those for whom it is not relevant.

How do metaphors influence health decisions?

Although the present results are promising in terms of explaining for whom culturally-relevant metaphors can be used, there are some ambiguities with understanding

the processes through which metaphors may be effective. The present study provides

some evidence for culturally-relevant health metaphors affecting at least one of the

cognitive processes by which health decisions are made (i.e., perceptions of benefits of

screenings; Hochbaum 1958, Champion 1999, Gozum & Aydın 2004, Reynolds et al.

2007). However, at first blush, these findings are contrary to research showing no effect

of metaphors on other mediating cognitions by which individuals change their health

behavior (Scherer et al., 2014). Specifically, the present study found that the collective-

familial metaphor was effective at increasing perceptions of benefits of Pap smears which

in turn increased Pap smear intentions at low levels of American acculturation and

individualism. Results also showed that the collective-familial metaphor, relative to the

non-metaphor, reduced participants' accuracy of Pap smears and cervical cancer

knowledge and lowered Pap smear intentions for those with weak familism values.

However, no mediating effects were found on vaccination intentions in Scherer et al

(2014) when a metaphor compared the flu to an army, weed, beast, or riot. There are

several immediately apparent differences between the Scherer et al. (2014) studies and

the present study that might shed light on these discrepancies. First, Scherer et al. (2014)

measured different mediating cognitions (i.e., perceived risk, severity, affect, control, and

understanding) than the present study (i.e., perceived benefits and barriers to screenings,

perceived seriousness of and susceptibility to cervical cancer, accuracy of Pap smears and

cervical cancer). Perhaps metaphors only impact specific cognitive processes that were

not measured in Scherer et al (2014). Second, the health threat presented in Scherer et al.

(2014) was the flu and the message described the flu in a single line of text in

metaphorical terms as either a beast, riot (Study 1 & 2), army, or weed (Study 3) or in

non-metaphor terms as a virus. In contrast, the present study featured cancer as the health threat and described the physical body in terms of metaphor (family) or non-metaphor. The present study also utilized this framing of protecting the "family" from cancer throughout the health message rather than in a single line of text. Perhaps then mediating cognitions that influence health behavior are activated only with a more serious health threat and/or by the metaphor being elaborated on throughout the health message. Third, Scherer et al. (2014) did not incorporate aspects of these potentially mediating cognitive processes into the health message whereas the present study reinforced the benefits of getting a Pap smear (e.g., protecting one's family). Thus, incorporating particular aspects of these cognitive processes into the metaphorical communication might be necessary for activating these cognitions.

Although there are a number of possible reasons for the ambiguity about how metaphors influence mediating cognitions, the idea that the message needs to metaphorically target potential cognitive processes may be particularly promising to consider. Indeed, in the present study, after receiving the familial metaphor, perceived benefits of Pap smears were more influential on intention outcomes (at least at low levels of American acculturation and individualism, while other cognitive processes from the HBM were either not influenced at all or were weakly influenced as they did not mediate intention outcomes. In hindsight, this makes sense. The family health metaphor message in this study was framed such that it highlighted the benefits of receiving a Pap smear (e.g., protecting one's family) but did less to bring attention to the minimal barriers of screenings (e.g., ease of getting a Pap smear), seriousness of cervical cancer (e.g., mortality and diagnoses), and susceptibility to cervical cancer (e.g., how many women

are diagnosed in a year). Perhaps had these other cognitions been highlighted more in the health message, stronger effects between the metaphor and these other cognitive processes would have emerged. This reasoning, however, is quite speculative especially given other ambiguities related to the overall patterns of moderated mediation across individual differences.

The relevance of individual differences to metaphoric theme

In the present study, conditionally moderated mediation effects were found for the metaphor message on Pap smear intention variables through perceptions of benefits to receive Pap smears, but only among Latinas who were less American acculturated or individualistic. However, no moderated mediation effects were found with collectivism and high levels of familism. Instead, direct interaction effects of the message with collectivism and familism were found on Pap smear intentions (though there was also an indirect effect of familism by metaphor through accuracy knowledge). One possible explanation is that the constructs of familism and collectivism, rather than American acculturation, are more directly relevant to the collective-family metaphor message. This could explain why the metaphor directly engaged Latinas' level of collectivism and strength of familial values to promote Pap smear intentions, while it only promoted perceptions of benefits of Pap smears among low American acculturated or less individualistic Latinas. Because the family metaphor message is not directly related to the construct of American acculturation or individualism, perhaps any influence of the metaphor message on Pap smear intentions, at low levels of American acculturation and individualism, was contingent on Latinas' perceptions of greater benefits to Pap smears.

A similar process may account for the lack of effects involving ethnic identity and, to an extent, Hispanic acculturation. Latino identity is not reducible to just endorsing collective or family values, but includes a variety of facets (e.g., personalismo, Trevino et al., 1991; respeto, Arredondo et al., 1996). Thus, in general, measures such as ethnic identity may have been less relevant to the collective-familial theme of the metaphor message. While ethnic identity could be argued to be an important individual difference in influencing culturally-relevant health messages and would seem to interact with a culturally tailored metaphor message, it seems less relevant than familism and collectivism in the context of upholding the well-being of the group (e.g., family) that is central to Latino culture (Triandis, 1989). The lack of effects for Hispanic acculturation might also reflect similar processes, but are admittedly a bit more puzzling as this seems to be more culturally relevant to the metaphor. Here, however, it is worth noting that highly Hispanic acculturated Latinas were underrepresented in this sample. For instance, only 27.3% of Latinas reported that Spanish was their primary language. Thus there may not have been enough variability in the sample to detect differences across this variable.

Sample Limitations

Indeed, questions about the size and characteristics of the sample are important to consider and may help to inform why there was inconsistency in effects that did emerge and some weaknesses to the patterns. Although the practical importance of these interactions (e.g., between familism and metaphor) is a separate issue, it should be noted that the present sample was a bit short of the size recommended to have sufficient power to detect significant differences (G*Power; Faul, Erdfelder, Buchner, & Lang, 2009). In addition, many of the moderator distributions were skewed. For example, for the

American acculturation x message interaction effect, Latinas' who are less American acculturated may have been underrepresented in this sample. Perhaps if non-English speaking Latinas were included, there may have been greater variability for American acculturation and the effect would have been stronger. Third, Pap smear intention variables and Pap smear perceptions and beliefs variables were all positively or negatively skewed. Although non-parametric tests are typically robust with respect to non-normality (Norman, 2010), these restrictions in range might have limited the variability across these dependent variables and the ability to detect effects (e.g., in willingness to pay or intentions to recommend).

Contributions and Additional Future Directions.

Despite these ambiguities, there is encouraging evidence that metaphors can be utilized in health messages to make health information more culturally relevant for Latinas. Additionally, the present study converges with prior research to suggest that metaphors can be effective at promoting beneficial health behavior primarily when taking into account for whom they are most relevant (Landau et al., in preparation). The collective-familial metaphor utilized in the present study seems to engage the individual differences of familism and collectivism such that for Latinas who were exposed to the metaphor message, the more collectivistic they were and the more strongly they valued familism, the greater their Pap smear intentions were. Further, novel evidence for the indirect impact of health metaphors on intentions through perceived benefits of receiving Pap smears was found for low level American acculturated and individualistic Latinas and a reversed effect of the health metaphor intentions through accuracy of knowledge

was found at low levels of familism. Of course, as noted earlier, these findings also reveal ambiguities that need to be addressed with future research.

This study also provides initial evidence for the use of metaphors within the sociocultural approach to health communication (Resnicow et al., 1998) to be an effective mechanism in promoting cancer prevention for individuals of various cultural and racial backgrounds. Specifically, the evidence suggests that health messages utilizing metaphors can be catered towards Latinas to promote cancer screenings when they are designed to be culturally relevant, especially when utilizing relevant aspects of Latino culture (e.g., familism, collectivism). Importantly, the familial health metaphor was effective in enhancing perceptions of the benefits of Pap smears for Latinas who are less American acculturated and have been shown to underutilize cancer screenings (Marks et al., 1990; Hu & Covell, 1986). Future studies should examine whether other aspects of Latino culture can be incorporated into the health metaphor message in order to determine which cultural facets are the most useful for promoting cancer screening intentions and behaviors among Latinos. Future studies examining the impact of culturally-relevant health metaphors for ethnic minorities should also investigate whether these findings can be generalized for use with men (e.g., colorectal cancer prevention) as well as other ethnicities (e.g., African American, Asian). If consistent results are found across other ethnicities and genders, this evidence would point to the use of metaphor as a feasible tool to be used in the health care system (e.g., patient-physician communication, health messages in the media) to reduce racial and ethnic health disparities.

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Tables

Table 1

Bivariate Correlations of Moderator, Mediator, and Outcome Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Amer-accult.	1										
2. Hisp-accult.	-.374**	1									
3. Collectivism	0.076	0.121	1								
4. Individualism	.169*	-0.048	.189*	1							
5. Familism	-0.072	.194*	.475**	.319**	1						
6. Ethnic ID	-0.1	.397**	.278**	0.029	.321**	1					
7. Maximize	-0.124	.187*	.319**	0.144	.397**	.220**	1				
8. Benefits	-0.001	-0.135	.158*	0.027	0.013	.182*	.257**	1			
9. Seriousness	0.033	-0.041	.173*	0.138	0.132	0.085	.169*	.209**	1		
10. Susceptibility	0.031	-0.013	.171*	0.109	.239**	-0.011	.182*	0.091	.328**	1	
11. Barriers	-0.095	0.083	0.016	0.138	.316**	0.032	.160*	-.187*	.223**	.475**	1
12. Accuracy	0.144	-0.017	0.088	-0.118	-.173*	0.049	0.04	.175*	-0.046	-0.085	-.305
13. Intentions	-0.071	0.093	.332**	0.074	.201**	.250**	.452**	.360**	0.102	.223**	-0.1.
14. Interest Learning	-0.133	.197*	.260**	.235**	.282**	.235**	.404**	.172*	0.108	.196*	0.10
15. Recommend	-0.139	.213**	.332**	0.071	0.088	.278**	.361**	.418**	0.137	.152*	-0.
16. Pay	-0.026	.184*	.203**	0.026	0.104	.157*	.342**	.153*	0.136	0.112	-0.0

*Correlations significant at p<.05

**Correlations significant at p<.001

Table 2

Conditional Indirect Effects as a function of Individualism

Individualism	Boot Indirect Effect	Boot *SE*	Boot *z*	Boot LLCI	Boot ULCI
Pap Smear Intentions					
low	0.11	0.06	1.74	0.004	0.26
medium	0.02	0.04	0.56	-0.07	0.12
high	-0.06	0.07	-0.82	-0.21	0.06
Interest Learning Pap Smears					
low	0.08	0.06	1.33	0.001	0.25
medium	0.02	0.04	0.51	-0.04	0.11
high	-0.04	0.06	-0.75	-0.19	0.04
Recommending Pap Smears to Others					
low	0.18	0.11	1.75	-0.001	0.4
medium	0.04	0.07	0.56	-0.11	0.19
high	-0.09	0.11	-0.84	-0.34	0.11
Pay for Pap Smears					
low	2.67	1.95	1.37	-0.02	7.84
medium	0.62	1.22	0.51	-1.47	3.67
high	-1.43	1.9	-0.75	-7.04	1.16

Note: Conditional indirect effects were estimated at low (5.25), medium (6.56), and high (7.87) levels of individualism (mean = 6.56; *SD* = 1.31). Boot Indirect Effect = bootstrap indirect effect; Boot *SE* = bootstrap of standard errors; Boot *z* = bootstrap of *z*-test; Boot LL CI = boot lower bound confidence interval and Boot UL CI = boot upper bound confidence interval.

Table 3

Conditional Indirect Effects as a function of Familism

Familism	Boot Indirect Effect	Boot *SE*	Boot *z*	Boot LLCI	Boot ULCI
Pap Smear Intentions					
low	-0.06	0.04	-1.47	-0.19	.-.005
medium	-0.002	0.03	-0.06	-0.06	0.06
high	0.06	0.05	1.21	-0.005	0.21
Recommending Pap Smears to Others					
low	-0.05	0.05	-1.06	-0.21	0.005
medium	-0.001	0.03	-0.05	-0.07	0.04
high	0.05	0.05	1.05	-0.006	0.2

Note: Conditional indirect effects were estimated at low (5.35), medium (6.87), and high (8.38) levels of familism (mean = 6.87; *SD* = 1.52). Boot Indirect Effect = bootstrap indirect effect; Boot *SE* = bootstrap of standard errors; Boot *z* = bootstrap of *z*-test; Boot LL CI = boot lower bound confidence interval and Boot UL CI = boot upper bound confidence interval.

Table 4

Conditional Indirect Effects as a function of
American acculturation

American Acculturation	Boot Indirect Effect	Boot *SE*	Boot *z*	Boot LLCI	Boot ULCI
Pap Smear Intentions					
low	0.15	0.06	2.32	0.04	0.28
medium	0.03	0.05	0.70	-0.06	0.13
high	-0.04	0.06	-0.70	-0.16	0.06
Interest Learning Pap Smears					
low	0.11	0.07	1.64	0.02	0.30
medium	0.03	0.04	0.59	-0.04	0.13
high	-0.03	0.05	-0.65	-0.15	0.05
Recommending Pap Smears to Others					
low	0.24	0.10	2.29	0.06	0.46
medium	0.05	0.08	0.70	-0.09	0.21
high	-0.06	0.09	-0.73	-0.24	0.10
Pay for Pap Smears					
low	3.76	2.18	1.73	0.65	9.60
medium	0.84	1.34	0.63	-1.25	4.13
high	-0.10	1.43	-0.70	-4.74	1.31

Note: Conditional indirect effects were estimated at low (3.43), medium (3.78), and high (4.00) levels of American acculturation (mean = 3.78; *SD* = .35). Boot Indirect Effect = bootstrap indirect effect; Boot *SE* = bootstrap of standard errors; Boot *z* = bootstrap of *z*-test; Boot LL CI = boot lower bound confidence interval and Boot UL CI = boot upper bound confidence interval.
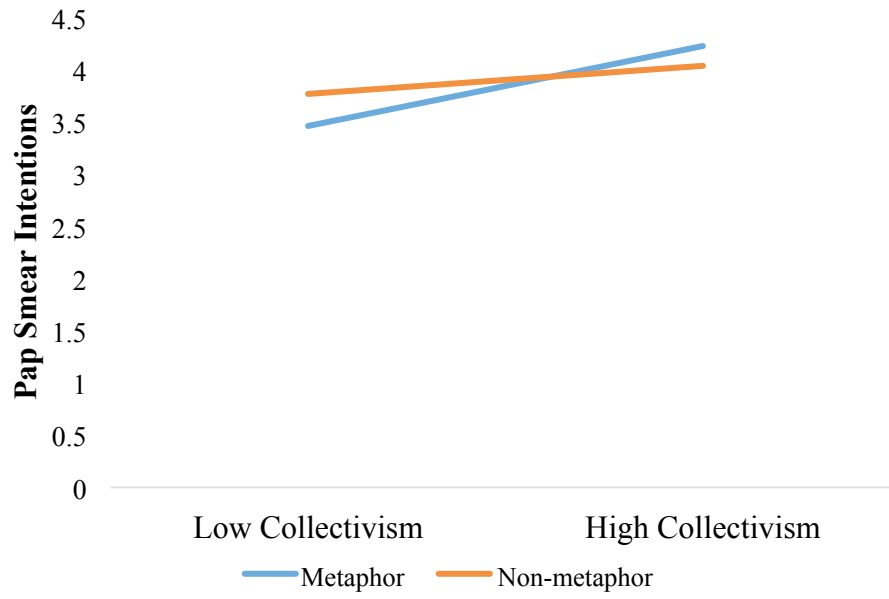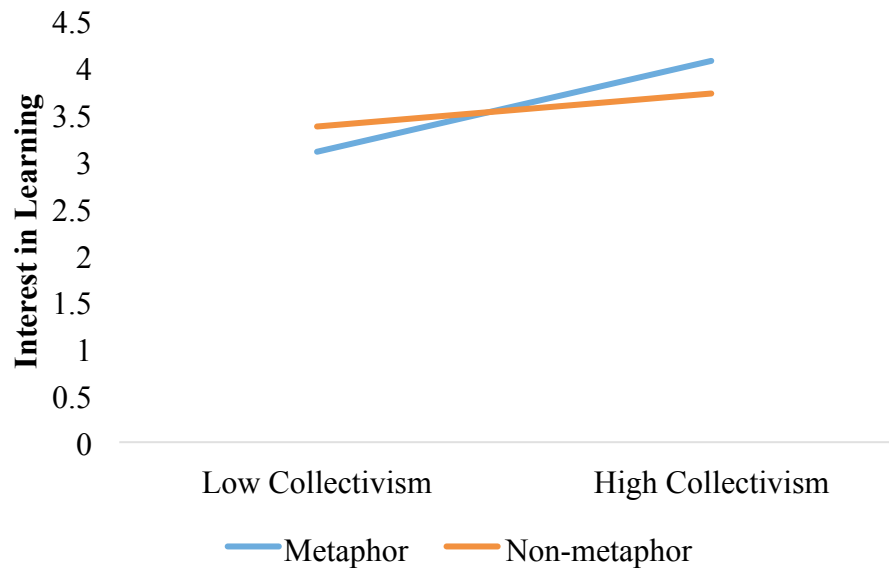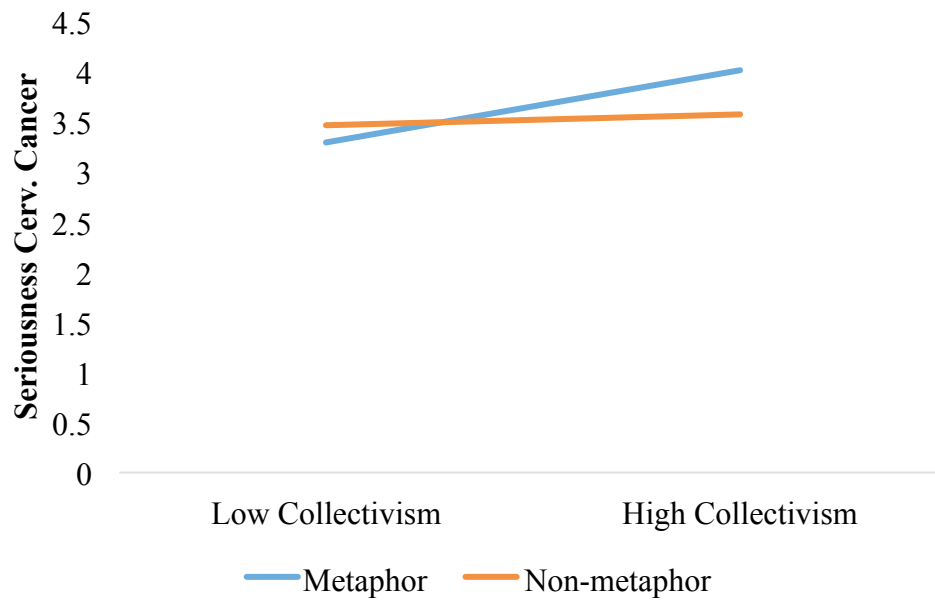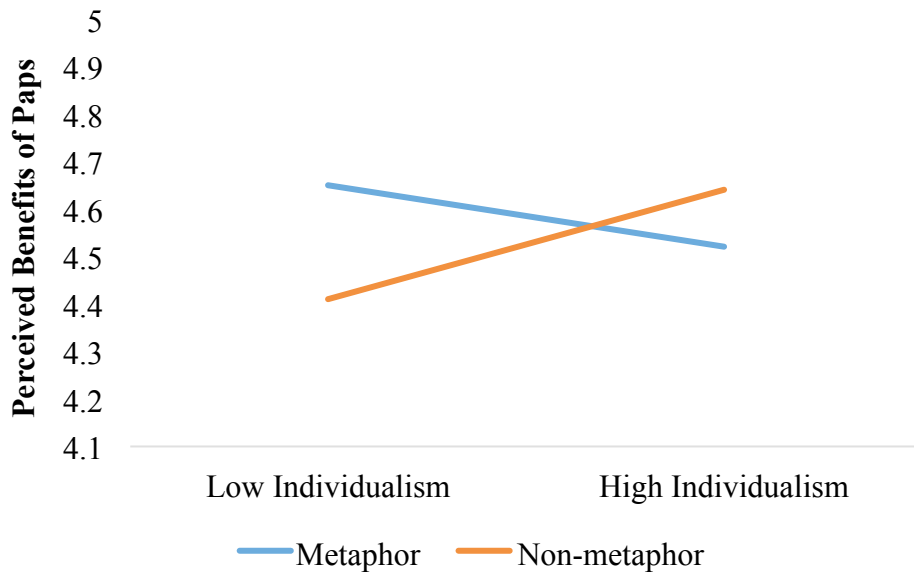
Figures

Figure 1

Figure 2
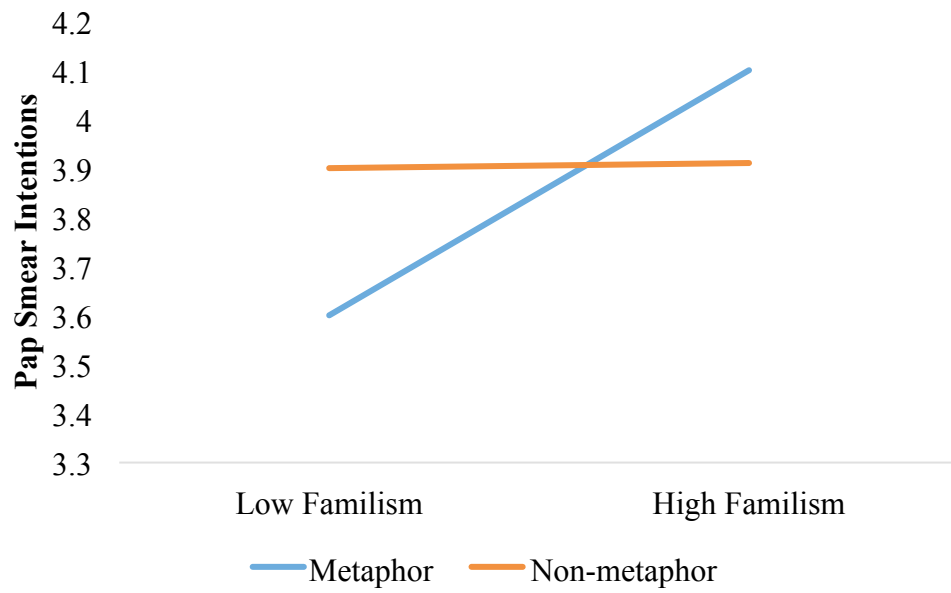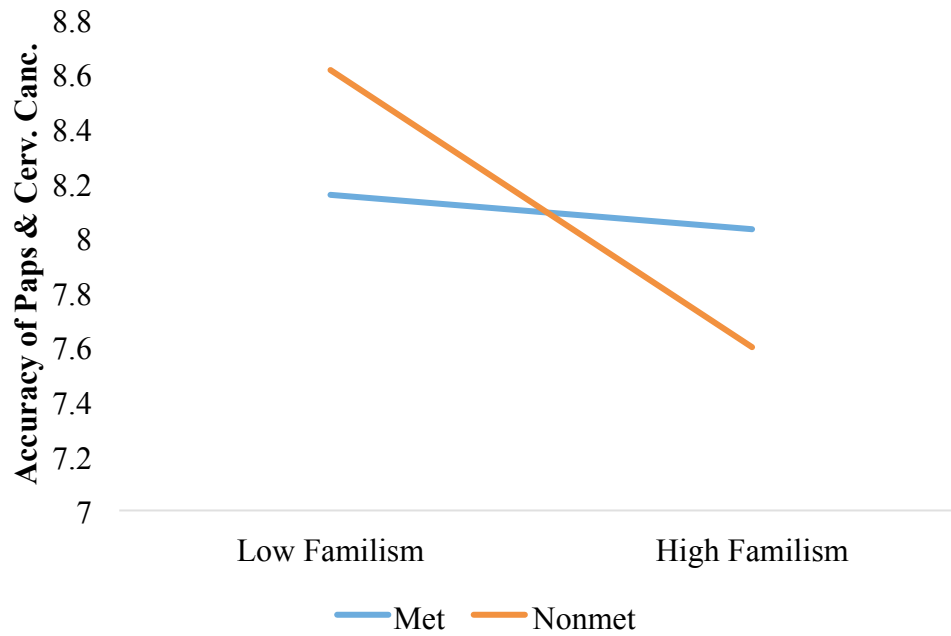
Figure 3

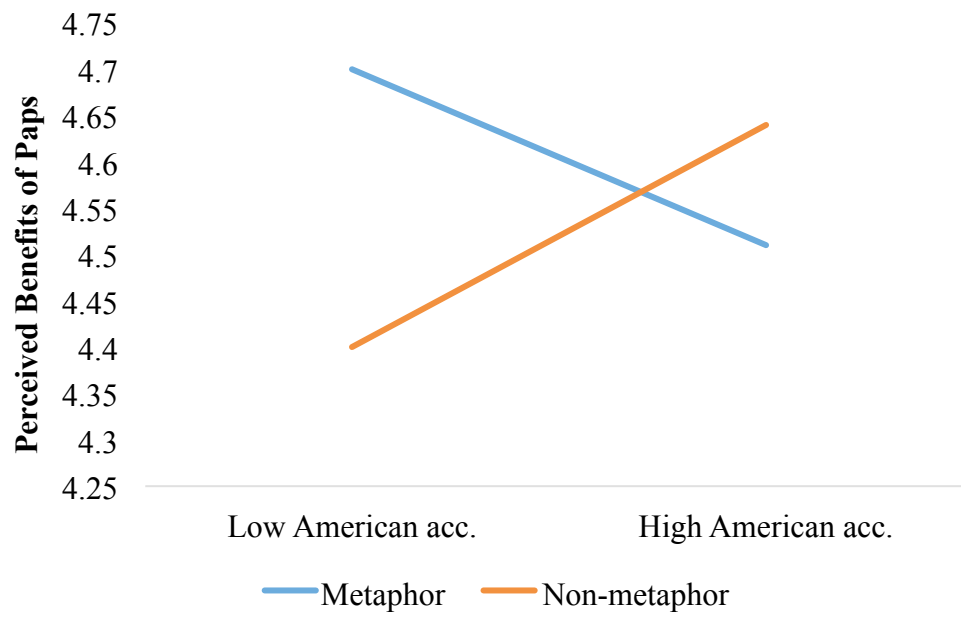Figure 4

Figure 5

Figure 6

Figure 7

Appendix

(Research Materials)

Screening Survey

Please answer the following demographic questions:

1. What is your age? _____
2. What is your sex?
   a. Male
   b. Female
   c. Transgender
3. Into what political party would you categorize yourself?
   a. Democrat
   b. Republican
   c. Green
   d. Libertarian
   e. Tea party
   f. Independent
   g. None
   h. Other
4. What is your religious affiliation?
   a. Protestant
   b. Catholic
   c. Jewish
   d. Atheist
   e. Agnostic
   f. Non-denominational
   g. Orthodox-Christian
   h. Christian
   i. Buddhist
   j. Hindu
   k. Muslim
   l. Other Eastern Religion
   m. American Indian or Native American
   n. Other
   o. Would rather not say
5. What is the highest degree or level of education you have completed?
   a. 0-6 years of education (no high school diploma)
   b. 7-12 years of education (no high school diploma)
   c. High school diploma
   d. Some college, no degree
   e. Associate or technical degree
   f. Bachelor's degree
   g. Master's degree
   h. Doctoral degree
6. Which of the following best represents your racial/ethnic identity? Choose all that apply:
   a. Non-Hispanic White or Euro-American
   b. Black, Afro-Caribbean, or African American
   c. Latino or Hispanic American
   d. East Asian or Asian American

e. South Asian or Indian American
f. Middle Eastern or Arab American
g. Native American or Alaskan Native
h. Other_____

_

Welcome to the study! On the following pages you will be asked to fill out a number of personality questionnaires and read a health message. Following this you will be asked to answer some questions about your attitudes regarding the health topic in the message. Please click the arrows in the bottom right-hand corner of the screen to continue.

Bidimensional acculturaltion scale for Hispanics (Marin & Gamba, 1996)

Please answer the following questions using the scales provided:

1	2	3	4
Never	Seldom	Sometimes	Often

1. How often do you speak in English?
2. How often do you speak in English with your friends?
3. How often do you think in English?
4. How often do you speak in Spanish?
5. How often do you speak in Spanish with your friends?
6. How often do you think in Spanish?
7. How often do you watch television programs in English?
8. How often do you listen to radio programs in English?
9. How often do you listen to music in English?
10. How often do you watch television programs in Spanish?
11. How often do you listen to radio programs in Spanish?
12. How often do you listen to music in Spanish?

1	2	3	4
Very poorly	Poorly	Well	Very well

13. How well do you speak English?
14. How well do you read in English?
15. How well do you understand television programs in English?
16. How well do you understand radio programs in English?
17. How well do you write in English?
18. How well do you understand music in English?
19. How well do you speak Spanish?
20. How well do you read in Spanish?
21. How well do you understand television programs in Spanish?
22. How well do you understand radio programs in Spanish?
23. How well do you write in Spanish?
24. How well do you understand music in Spanish?

Religion Subscale of Mexican American Cultural Values Scale (Knight et al., 2009)

The following statements are about what people may think or believe. Remember, there are no right or wrong answers. Tell me how much you believe that . . .

1 = Not at all 2 = A little 3 = Somewhat 4 = Very much 5 = Completely

1. It is important to follow the Word of God.
2. If everything is taken away, one still has their faith in God.
3. One's belief in God gives inner strength and meaning to life.

Cultural Orientation Scale (Triandis & Gelfland 1998)

Please rate your agreement with the following statements using the scale below:

1   2   3   4   5   6   7   8   9

 Never or
Always or definitely no
definitely yes

1. I'd rather depend on myself than others.
2. It is my duty to take care of my family, even when I have to sacrifice what I want.
3. If a coworker gets a prize, I would feel proud.
4. The well-being of my co-workers is important to me.
5. It is important that I do my job better than others.
6. Parents and children must stay together as much as possible.
7. I rely on myself most of the time; I rarely rely on others.
8. Winning is everything.

Attitudinal Familism Scale (Steidel & Contreras, 2003)

Please rate how much you agree or disagree with the following statements using the scale below:

1	2	3	4	5	6	7	8	9

10
Strongly
Strongly
Disagree
Agree

1. The family should control the behavior of children younger than 18.
2. A person should live near his or her parents and spend time with them on a regular basis.
3. Parents and grandparents should be treated with great respect regardless of their differences in views.
4. Aging parents should live with their relatives.
5. Children younger than 18 should give almost all their earnings to their parents.
6. Children should live with their parents until they get married.
7. A person should be a good person for the sake of his or her family.
8. A person should respect his or her older brothers and sisters regardless of their differences in views.

Multigroup Ethnic Identity Measure (Phinney, 1992)

Use the numbers below to indicate how much you agree or disagree with each statement regarding the ethnic group you most strongly identify with.

(1) Strongly disagree (2) Disagree   (3) Agree   (4) Strongly agree

1. I have a clear sense of my ethnic background and what it means to me.
2. I am happy that I am a member of the ethnic group I belong to.
3. I have a strong sense of belonging to my own ethnic group.
4. I understand pretty well what my ethnic group membership means to me, in terms of how to relate to my own group and other groups.
5. I feel a strong attachment towards my own ethnic group.
6. I feel good about my cultural or ethnic background.
7. I enjoy being around people from ethnic groups other than my own.

Maximizer/minimizer scale (Scherer et al. 2014)

Please respond to the following statements using the scale below:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Strongly
disagree

Strongly
agree

1. When it comes to health care, the only responsible thing to do is to actively seek medical care.
2. If I have a health issue, my preference is to wait and see if the problem gets better on its own before going to the doctor.
3. If I feel unhealthy, the first thing that I do is to go to the doctor and get a prescription.
4. I often suggest that friends and family see their doctor.
5. When it comes to health care, watching and waiting is never an acceptable opinion.
6. If I have a medical problem, my preference is to go straight to a doctor and ask his or her opinion.
7. When it comes to medical treatment, more is usually better.

Social Desirability Scale (Crowne & Marlowe, 1960)

Now we would like to ask you some general questions about your personality. Please answer the questions using the scales provided.

For each of the following statements, please indicate whether it is true or not true for you:

1. It is sometimes hard for me to go on with my work if I am not encouraged.
   True/False
2. I sometimes feel resentful when I don't get my way.
   True/False
3. No matter whom I'm talking to, I'm always a good listener.
   True/False
4. There have been occasions when I took advantage of someone.
   True/False
5. I'm always willing to admit it when I make a mistake.
   True/False

Experiential/Rational Inventory (Norris & Epstein, 2011)

For each of the following statements, please indicate the extent to which it is true or not true for you:

1 = *Definitely not true of myself*; 5 = *Definitely true of myself*

1. I enjoy problems that require hard thinking.
2. I am not very good in solving problems that require careful logical analysis.
3. I enjoy reading things that evoke visual images.
4. I enjoy imagining things.
5. I enjoy intellectual challenges.

<u>*Health Literacy Items*</u>

Please answer the following questions using the scale provided

Morris et al. 2006

1. How often do you need to have someone help you when you read instructions, pamphlets, or other written material from your doctor or pharmacy?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

Wallace et al., 2006

2. How confident are you filling out medical forms by yourself?

1	2	3	4	5
Not at all Confident	A little bit confident	Somewhat confident	Quite a bit confident	Very much confident

Sometimes people find it difficult to understand scientific information. To help people understand this information, communication researchers are working on ways to change how health information is presented. They have come up with messages called "Sum-ups". Next we'll ask you to read a Sum-up and tell us your impression of it.

METAPHOR CONDITION

What is a Pap Smear Test?

Here are some basic points about a Pap Smear:

- It is recommended to receive a Pap smear once every three years
- It is performed by most healthcare providers during a gynecologic checkup
- Cells are taken from the cervix during a pelvic exam and tested for signs of cervical cancer
- If detected early, cervical cancer can be cured
- The exam can be uncomfortable but it is not painful
- The exam takes only a few minutes
- The results are generally available in a few weeks
- It is recommended to receive a Pap smear once every three years

Why should you get a Pap Smear?

One way to consider this question is to think about the connection between your body and a family. You know that a family is made up of lots of people, like a father, mother, children, aunts, uncles, cousins, and grandparents. And you know that what keeps a family strong is that they all work together and depend on each other. When each family member is cared for, a family is stronger as a whole. Your body works in the same way. It is made up of many parts that all work together. Like a family, they communicate back and forth and rely on each other to keep your body well. So you can think about it like this: Getting a Pap Smear every three years is like making sure that a member of your family is cared for. And that's what it takes to keep the whole "family" of your body healthy, safe, and strong for years to come.

(words = 159)

NO METAPHOR CONDITION

What is a Pap Smear?

Here are some basic points about a Pap Smear:

- It is recommended to receive a Pap smear once every three years
- It is performed by most healthcare providers during a gynecologic checkup
- Cells are taken from the cervix during a pelvic exam and tested for signs of cervical cancer
- If detected early, cervical cancer can be cured
- The exam can be uncomfortable but it is not painful
- The exam takes only a few minutes
- The results are generally available in a few weeks

Why should you get a Pap Smear?

One way to consider this question is to think about the connection between the parts of your body. You know that a body is made up of many organs, like a heart, brain, kidneys, liver, stomach, lungs, and pancreas. These organs belong to what are called *body systems*. You may have heard of the digestive system, respiratory system, and circulatory system. Others include the endocrine and lymphatic systems. What keeps the body healthy is when all those systems function properly, and that depends on each organ being healthy. For example, in your circulatory system, blood is pumped by the heart, cleaned by kidneys, and receives chemicals from the pancreas. So you can think about it like this: Getting a Pap Smear every three years is one way to make sure that a part of your body is healthy. And that's what it takes to keep body systems functioning properly and your whole body healthy, safe, and strong for years to come.

(words = 160)

Please respond to the following questions using the scales provided:

1. Do you plan to get a Pap Smear Test in the coming year?

1	2	3	4	5
Definitely not	Probably not	Maybe	Probably	Definitely

2. How often in the future do you intend to receive a Pap Smear Test?

1	2	3	4	5
Never	Rarely	Sometimes	Regularly or at least once every 3 years	Frequently or more than once every 3 years

3. Please rate your intentions to obtain a Pap Smear Test every three years using the scale below:

1	2	3	4	5
Definitely not	Probably not	Maybe	Probably	Definitely

4. How sure or unsure are you that you will get a Pap Smear Test every three years?

1	2	3	4	5
I am very unsure	I am somewhat unsure	I am neither sure nor unsure	I am somewhat sure	I am very sure

5. How interested are you in learning more about the benefits of Pap Smear Tests in detecting cervical cancer early?

1	2	3	4	5
Not at all interested				Extremely interested

6. How likely are you to recommend getting a Pap Smear Test to your female friends and family members?

1	2	3	4	5
Not at All likely				Extremely likely

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7. How much would you like to receive more information regarding Pap Smear Tests?

         1   2   3   4   5

    Not at   A great deal
    all

8. How much would you like to sign up for an automated email or telephone reminder to schedule a Pap Smear Test regularly?

         1   2   3   4   5

    Not at   A great deal
    all

9. Imagine that you do not have health insurance or that your health insurance does not cover a Pap Smear Test. How much would you be willing to pay for a Pap Smear Test?

    Slider scale: 0-200$

Please rate how much you agree with the following statements using the scale provided:

1	2	3	4	5
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree

1. I think that having a regular Pap Smear Test is the best way for cervical cancer to be diagnosed early.

2. Having regular Pap Smear Tests will help to find changes to the cervix, before they turn into cancer.

3. I want to discover health problems early.

4. I feel it is important to carry out activities, which will improve my health.

5. I am afraid to think about cervical cancer.

6. The thought of cervical cancer scares me.

7. It is likely that I will get cervical cancer in the future.

8. My chances of getting cervical cancer in the next few years are high.

9. I am afraid to have a Pap Smear Test because I don't know what will happen

10. Having a Pap Smear Test takes too much time.

11. Having a Pap Smear Test is too painful.

Please rate how much you agree with the following statements using the scale provided:

1	2	3	4	5
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree

1. I believe if someone is meant to get cancer, they will get it no matter what they do.
2. I believe if someone gets cancer, it doesn't matter when they find out about it, they will still die from it.
3. When I think of cancer I automatically think of death.

We are interested in learning your beliefs about Pap smears. Please respond to the following statements indicating which you believe to be True or False.

1. Women should get Pap smears only during child bearing years.
2. After a couple of Pap smears, there is no need for more.
3. You can tell if someone has cervical cancer.
4. Hispanic women are more likely to get cervical cancer.
5. Pap smears are painful.
6. Pap smears are expensive.
7. There is no need for Pap smears after menopause.
8. My doctor should tell me if I need a Pap smear.
9. There is no need to have a Pap smear after a hysterectomy.
10. There is no need to have a Pap smear after tubal ligation.
11. Only women with many sex partners need Pap smears.

Please answer the following questions regarding your personal and family history of Pap Smear Tests and Cancer.

1. Have you ever had an abnormal Pap smear?
    a. Yes
    b. No
2. Have any of your female family members ever had an abnormal Pap smear?
    a. Yes
    b. No
3. Have you ever been diagnosed with cervical cancer?
    a. Yes
    b. No
4. Have any females in your family ever been diagnosed with cervical cancer?
    a. Yes
    b. No
5. Have any females in your family died from cervical cancer?
    a. Yes
    b. No
6. Have you had any other types of cancer? If yes, what type?
    a. Yes   type:_____
    b. No
7. Have any of your first-degree relatives ever had any other types of cancer? If yes, what type?
    a. Yes   Family member_____ Type of Cancer_____
    b. No
8. Have you ever had an HPV test? If yes, was it negative or positive?
    a. Yes   Positive_____ Negative____
    b. No
9. How many Pap smears have you had in the last 5 years? _____

Demographics

Please answer the following demographic questions:

7. What is your age? _____

8. What is your sex?
    a. Male
    b. Female
    c. Other

9. Which of the following best represents your racial/ethnic identity? Choose all that apply:

Note: This will not affect your compensation for taking the survey, we just want honest answers

    a. Non-Hispanic White or Euro-American
    b. Black, Afro-Caribbean, or African American
    c. Latino or Hispanic American
    d. East Asian or Asian American
    e. South Asian or Indian American
    f. Middle Eastern or Arab American
    g. Native American or Alaskan Native
    h. Other_____

10. *For Hispanics only* What is your ethnic origin? Choose all that apply:
    a. Mexican
    b. Puerto Rican
    c. Cuban
    d. Dominican
    e. Salvadoran
    f. Other_____
    g. Unsure

11. Please select the generation that best applies to you:
    a. 1st generation (you were born in another country)
    b. 2nd generation (you were born in USA; either parents were born in another country)
    c. 3rd generation (you were born in the USA; both parents born in USA and all grandparents born in another country)
    d. 4th generation (you and your parents born in USA and at least one grandparent born in another country with remainder born in the USA)
    e. 5th generation (you and your parents born in the USA and all grandparents born in the USA)

12. What category best describes your household income?
    a. Less than $24,999
    b. $25,000-$49,999

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    c. $50,000-$99,999

    d. $100,000 or more

13. What is the highest degree or level of education you have completed?

    a.   0-6 years of education (no high school diploma)

    b.   7-12 years of education (no high school diploma)

    c.   High school diploma

    d.   Some college, no degree

    e.   Associate or technical degree

    f.   Bachelor's degree

    g.   Master's degree

    h.   Doctoral degree

14. Do you have health insurance? Yes   No

15. Does your health insurance cover a Pap smear?

    a.   Yes

    b.   No

    c.   Unsure

16. How many sexual partners have you had in your lifetime?

    a.   _____(open numeric response)

17. What is your primary language?

    a.   English

    b.   Spanish

    c.   Other_____