

ATTITUDES, NORMS, AND BEHAVIORAL CONTROL FACTORS ASSOCIATED
WITH INTENTION TO RECEIVE CERVICAL CANCER SCREENING IN HISPANIC
AMERICANS

A Thesis

Presented to

The Faculty of the Department of Psychology
Sam Houston State University

In Partial Fulfillment

of the Requirements for the Degree of

Master of Arts

by

Emily A. Tullos

August, 2020

ATTITUDES, NORMS, AND BEHAVIORAL CONTROL FACTORS ASSOCIATED
WITH INTENTION TO RECEIVE CERVICAL CANCER SCREENING IN HISPANIC
AMERICANS

by

Emily A. Tullos

APPROVED:

Chelsea Ratcliff, PhD
Committee Director

Craig Henderson, PhD
Committee Member

David Nelson, PhD
Committee Member

Glen Sanford, PhD
Dean, College of Humanities and Social
Sciences

ABSTRACT

Tullos, Emily A., *Attitudes, norms, and behavioral control factors associated with intention to receive cervical cancer screening in Hispanic Americans*. Master of Arts (Psychology) August, 2020, Sam Houston State University, Huntsville, Texas.

Cervical cancer screening rates are significantly lower in Hispanic Americans than non-Hispanic Americans. This may lead to thousands of unnecessary deaths per year. The current study sought to understand cervical cancer screening intentions among Hispanic Americans using the Theory of Planned Behavior.

149 Hispanic American women (100 English-speaking and 49 Spanish-speaking) were recruited via Amazon Turk to complete a cross-sectional survey measuring attitudes (medical embarrassment), subjective norms (marianismo beliefs and acculturation), and perceived behavioral control (self-efficacy and health literacy). Hierarchical regression was used to determine the individual and collective influence of these variables on cervical cancer screening intentions.

Results differed based on the language of the sample. Country of origin and beliefs in being a pillar for the family were significant predictors of intentions in the English-speaking sample, while beliefs in being virtuous and chaste were significant in the Spanish-speaking sample. In both samples, self-efficacy was a significant predictor of cervical cancer screening intentions

Future interventions to increase screening in this population should focus on strengthening self-efficacy concerning cervical cancer screening. Additionally, differences in predictors based on spoken language should be taken into account when encouraging women to obtain screening.

KEY WORDS: Theory of planned behavior, Cervical cancer, Health behaviors

ACKNOWLEDGEMENTS

First and foremost, I would like to thank my thesis chair, Chelsea Ratcliff. Even though the path to my defense and my degree looked a lot different than I had thought they might, she always believed in me and my abilities. Thank you for sharing your expertise, time, and endless positivity with me throughout the course of this project.

I would also like to share a big thank you to Drs. Henderson and Nelson for taking the time to critique this project and help move it forward.

Lastly, I would like to thank my grandma (Nonnie) and my friends Taylor, Jessie, Kasey, Bri, and Camelia for always providing great encouragement/threats. There is nothing like hearing “wow, it was 45 pages! How many pages is it now?” to make you realize that it’s still 45 pages and you need to sit down and get things done.

TABLE OF CONTENTS

| | Page |
|--|-------------|
| ABSTRACT..... | iii |
| ACKNOWLEDGEMENTS..... | iv |
| TABLE OF CONTENTS..... | v |
| LIST OF TABLES..... | vi |
| CHAPTER I: INTRODUCTION | 1 |
| Understanding Screening Behaviors: Beyond SES..... | 2 |
| The Theory of Planned Behavior in Cervical Cancer Screening..... | 3 |
| Attitudes: Medical Embarrassment..... | 8 |
| Subjective Norms: Marianismo and Acculturation | 9 |
| Perceived Behavioral Control: Health Literacy and Self-Efficacy..... | 11 |
| Current Study..... | 13 |
| CHAPTER II: METHODS | 15 |
| Participants | 15 |
| Procedure | 15 |
| Measures | 16 |
| Statistical Analysis..... | 20 |
| CHAPTER III: RESULTS | 21 |
| Structural Equation Modelling | 22 |
| Results for English-Speaking Sample | 22 |
| Results for Spanish-Speaking Sample..... | 25 |
| CHAPTER IV: DISCUSSION | 36 |

| | |
|--|----|
| Effects of Study Variables on Cervical Cancer Screening Intentions | 38 |
| Strengths and Limitations | 41 |
| Implications | 42 |
| REFERENCES | 44 |
| VITA | 51 |

LIST OF TABLES

| Table | Page |
|--|-------------|
| 1 Demographics of Study Participants..... | 28 |
| 2 Psychometric Information for Study Variables: English-Speaking Sample..... | 29 |
| 3 Intercorrelations Between Study Measures with Outliers: English-Speaking Sample..... | 30 |
| 4 Hierarchical Multiple Regression Predicting Cervical Cancer Screening Intentions: English-Speaking Sample..... | 31 |
| 5 Psychometric Information for Study Variables: Spanish-Speaking Sample | 32 |
| 6 Intercorrelations Between Study Measures with outliers: Spanish-Speaking Sample..... | 33 |
| 7 Hierarchical Multiple Regression Predicting Cervical Cancer Screening: Spanish-Speaking Sample with Outliers Included..... | 34 |
| 8 Hierarchical Multiple Regression Predicting Cervical Cancer Screening: Spanish-Speaking Sample without Outliers Included..... | 35 |

CHAPTER I

Introduction

The American Cancer Society estimates that in 2020 there will be 13,800 new cases of invasive cervical cancer diagnosed in American women, and that 4,290 individuals will die from the disease (American Cancer Society, 2020). Despite these gloomy statistics, up to 93 percent of invasive cervical cancers are preventable by screening (i.e., pap testing) and Human Papillomavirus (HPV) vaccination (Center for Disease Control and Prevention, 2014). The US Preventative Services Task Force and the American Cancer Society recommend that women from the ages of 21-29 should obtain a pap test every three years, and women ages 30-65 should obtain a pap test combined with an HPV test (also known as “co-testing”) every five years (American Cancer Society, 2018; US Preventative Services Task Force, 2018) . Once women reach the age of 65, pap testing is no longer recommended for women of average cervical cancer risk. Unfortunately, less than two-thirds of women of testing age are currently meeting cervical cancer screening recommendations (MacLaughlin et al., 2019). Despite the widespread availability of pap testing, rates of cervical cancer screening have decreased in all ages groups according to a study including approximately 30 percent of US workers with employer-provided health insurance (Watson, Benard, & Flagg, 2018).

Latina women bear the second highest rate of cervical cancer diagnoses in the United States, after African American women (Siegel, Miller, & Jemal, 2020). In addition to experiencing higher rates of cervical cancer, white Hispanic women live nearly 2 and a half years shorter than white non-Hispanic women diagnosed with cervical cancer, and have an increased risk of death from cervical cancer once diagnosed (Khan,

2016). This is likely due to delayed screening: Hispanic women are more likely to be diagnosed with Grade II to IV cancers (later-stage cancers) than their non-Hispanic white counterparts (Khan, 2016).

This staggering health disparity could be prevented with adequate cervical cancer screening for all ethnic groups. Indeed, the CDC emphasizes that engaging in regular screening is the most important thing individuals can do to decrease their risk of developing cervical cancer (National Center for Immunization and Respiratory Diseases, 2018). Screening for cervical cancer can occur via the pap test or the human papillomavirus (HPV) test. The pap test screens for cell changes that occur in the cervix prior to cervical cancer, while the HPV test determines whether an individual has the virus that can cause these cell changes (National Center for Immunization and Respiratory Diseases, 2018). Hispanic women of screening age (21-65) are significantly less likely to endorse having completed pap testing on schedule than those of other ethnicities (Shoemaker & White, 2016). The current study will use the Theory of Planned Behavior (Ajzen, 1991) to examine the influences of individual attitudes (i.e., medical embarrassment), subjective norms (i.e., marianismo), and control beliefs (i.e., self-efficacy and health literacy) on cervical cancer screening intentions in Latinas, which will pave the way for future interventions to be tailored to this medically underserved population.

Understanding Screening Behaviors: Beyond SES

When considering the barriers to cervical cancer screening, issues of access and affordability are indeed important, although research is not conclusive concerning just how large a role these socioeconomic status (SES)-related issues play in the lack of

cervical cancer screening behaviors among Latinas. Hispanic individuals have the highest rate of being uninsured (17%) compared to other ethnic groups; only 8% of White individuals and 12% of Black individuals reported being uninsured (National Center for Immunization and Respiratory Diseases, 2018). Though one study found that women who are underinsured or lacked insurance were 19% less likely to receive cervical cancer screenings on schedule (Zhao et al., 2018), another study found that about 70 percent of women who have not been screened in the last five years reported having both a regular doctor and health insurance (Center for Disease Control and Prevention, 2014). Since many women are delaying screening despite having a healthcare support system in place, other factors that may affect noncompliance should be investigated. For example, one study showed that Hispanic and Asian women living in “high enclave” (i.e., ethnically segregated) neighborhoods who endorsed low SES were 12.7 times more likely to report invasive cervical cancer than their Hispanic and Asian counterparts living in low enclave neighborhoods with high SES (Froment et al., 2014). Interestingly, Hispanic and Asian women living in *low* enclave neighborhoods with *low* SES were only 1.6 times more likely to report invasive cervical cancer. Thus, though SES and insurance status are risk factors for not participating in the screening process, other factors related to attitudes and cultural norms may be more pertinent to risky health behaviors than lack of insurance or money.

The Theory of Planned Behavior in Cervical Cancer Screening

The Theory of Planned Behavior (TPB) was developed by Icek Ajzen with inspiration from the theory of reasoned action (Ajzen, 1991). The TPB combines the influences of attitude, subjective norms, and control beliefs to predict intention, which

theoretically predicts behavior. Attitudes are defined as feelings and beliefs that individuals hold toward a given topic. For example, “the thought of going to the doctor makes me gag” is a negative attitude in the context of the TPB model. Subjective norms are societal in nature, and can include social pressure, cultural, or familial beliefs. For example, “my coworkers think I should go to the doctor and stay at home if I’m sick” could be considered a normative belief. Control beliefs deal with the level of perceived control that an individual has to perform a particular behavior. For example, the statement “if I wash my hands, I can avoid becoming sick” delineates a control belief. In the TPB model, all of the above factors interact with each other, and can collectively be used to predict intention (e.g., endorsing the statement “I plan to go to the doctor”), which later impacts actual behavior (e.g., going to the doctor). The TPB is often used in behavioral health research and provides an excellent framework in which to address the questions of the current study.

The TPB has been used in many studies of health behaviors, including predicting cancer screening intention (Cooke & French, 2008). In one previous study, Smith-McLallen & Fishbein (2008) found that attitude, subjective norms, and perceived behavioral control (each construct measured by a single item such as “how many of the people who are most similar to you got a mammogram in the past year”) were all significant predictors of intention to receive mammogram, colonoscopy, and prostate cancer screening tests. This study also found that injunctive norms (an aspect of subjective norms under the TPB framework) were a particularly strong predictor of obtaining a colonoscopy or prostate cancer screening test, and perceived behavioral control emerged as the strongest predictor of intention to receive a mammogram. In

regard to how well intention predicts behavior in the TPB framework, an online survey examining Italian women's attitudes, subjective norms, and behavioral control (as measured by 4-9 items falling under each construct instruments) found that intention explained 39 percent of the variance in self-reported cancer promotion behavior (Di Sarra et al., 2015). Furthermore, in a meta-analysis on screening behaviors, the three factors of the TPB predicted intention, and intention had a medium effect on completing a variety of screening behaviors such as mammograms and general health wellbeing checkups (Cooke & French, 2008). The predictive validity of the TPB for intention *and* behavior has also been supported in cancer-related research unrelated to screening: one meta-analysis examining the use of the model in predicting sun-protection intention and behavior found that subjective norms, attitude, and perceived behavioral control predicted both intention and behavior in the studies examined (Starfelt Sutton & White, 2016).

The TPB has also been shown to be superior to other similar theories of health prediction. For example, one study investigated the predictive value of the TPB compared to another frequently used behavioral prediction theory (self-regulation theory) in predicting attendance at treatment for cervical cancer after an abnormal pap smear (Orbell et al., 2006). Notably, the TPB demonstrated superior prediction of intention, accounting for 39 percent of the variance in contrast to 8 percent by the self-regulation model.

Two previous studies have examined the use of the TPB in the context of cervical cancer screening intention, with only one examining the model among Latinas specifically. In a study using an expanded TPB model among Latinas, which included acculturation and past screening behavior in addition to the original three factors, all

factors measured had a significant effect on cervical cancer screening intention (Roncancio, Ward, & Fernandez, 2013). In this study, subjective norms were measured by an item asking if those close to the individual believe that she should have a pap smear in the next year, attitude was measured by a question asking if the person thought receiving a pap smear would be more beneficial or harmful for them, and perceived behavioral control was measured by two questions asking if the individual had control over getting a pap smear, and how difficult that task would be. The other study used the TPB to predict willingness to obtain HPV testing compared to pap testing as a method of cervical cancer screening, and was conducted among Canadian women (Ogilvie et al., 2016). This study found that the effects of subjective norms (as measured by 11 questions created by the researchers investigating subjective pressure from a variety of sources to be screened) and perceived behavioral control (measured by 4 items created by the researchers investigating confidence and control in obtaining the procedure) significantly predicted intention to complete the HPV testing (Ogilvie et al., 2016). The research above indicates using the TPB to elucidate the predictive relationship of attitudes, subjective norms, and behavioral control with cancer screening intentions and behavior is a feasible research endeavor, and that various conceptualizations of the TPB factors have shown significance in predicting intention to undergo cancer screening within diverse samples.

Despite previous success in using this model, some weaknesses were present in the design of this previous research. Specifically, the previous studies reviewed have had a number of psychometric limitations. In Roncancio and colleagues' study of cervical cancer screening intention in Latina women sampled from Houston and California, all variables other than acculturation were measured with 1-2 questions which had not been

previously validated (2013). Similarly, Smith-McLallen and Fishbein's (2008) study of TPB variables in mammogram, colonoscopy, and prostate cancer screening intentions used single-question measures of behavioral intention, while the Ogilvie et al. (2016) study of HPV cervical cancer screening among Canadians used no more than 11 self-created questions to measure each construct. Additionally, both the Ogilvie et al. and Smith-McLallen and Fishbein studies may have been overpowered at 981 participants and 1753 participants, which may have resulted in the study detecting clinically significant differences when in fact none existed. Some previous studies have also used very problematic criteria for cervical cancer screening that would not match with current recommendations. For example, the Ogilvie et al. (2016) study measured intention as "willingness to complete HPV testing every four years rather than having a pap test every year" - neither of which are in line with the current recommendations of obtaining a pap test every 3 years for those ages 21-30, or obtaining a co-test every 5 years. Despite these issues, these previous studies can serve as preliminary support for the use of the TPB in evaluating cervical cancer screening intentions among Latinas.

The current study will improve research in this area by using well-validated measures to conceptualize the factors subsumed within the TPB. Though there is preliminary evidence in support that the factors of medical embarrassment, self-efficacy, and health literacy influence cervical cancer screening, no previous study has combined the three in a coherent framework such as the Theory of Planned Behavior. In addition, no previous research has elucidated the influence that marianismo may have on cervical cancer screening intention or behavior. Thus, the current study will add to scientific knowledge in the area of cervical cancer screening by confirming and integrating

previous literature, as well as exploring a novel concept that may lead to further study of cultural influences in cancer screening.

Attitudes: Medical Embarrassment

Medical embarrassment is a form of embarrassment that can be present in the face of medical procedures such as pap testing. The idea that embarrassment may contribute to the postponement of receiving medical services has been examined through qualitative and quantitative means in past research. Since past research has found a significant influence of medical embarrassment in a variety of demographics, it makes sense to extend this line of research by investigating its influence on U.S. Latina sample.

In a study using focus groups of older Hispanic and African American women, participants endorsed embarrassment associated with testing to be a key barrier to obtaining a pap test (Nonzee, 2015). One study of American women who had not received mammograms and/or pap tests on schedule found that 11% of the variance in pap test barriers related to medical embarrassment (Glasgow et al., 2000). In further support of medical embarrassment as an influence in screening, a study of female store clerks in Mexico found that embarrassment and fear surrounding pap testing significantly predicted nonadherence to treatment guidelines. Women who endorsed high levels of these emotions were 16 times less likely to adhere to Mexican cervical cancer screening guidelines than those endorsing lower levels of the emotion (Wall et al., 2010). This relationship remained significant even when adjusting for educational attainment and income level. In a qualitative study examining 22 Ugandan women, embarrassment in relation to perceptions of others and embarrassment related to the procedures involved in testing were found to be important impediments to getting cervical cancer screening

(Teng et al., 2014). In the one-on-one interviews and focus groups, women endorsed two distinct versions of embarrassment: a societal version concerning the perceptions of others, and personal embarrassment concerning lack of knowledge and discomfort with the procedure (Teng et al., 2014). Lastly, in two samples of American college students from the east and west coasts, individuals attended sexual healthcare visits more frequently if they had lower levels of medical embarrassment as measured by a medical embarrassment-specific questionnaire, particularly related to their body (indicated by items such as “showing my body to a stranger, even to a doctor, is humiliating”), with judgment concerns (i.e., “I worry that my doctors will scold me for my bad state of health”) moderating the relationship between medical embarrassment and sexual healthcare visits, particularly in women (Consedine, Krivoshekova, & Harris, 2007).

Taken together, the previous literature in this area identifies that embarrassment related to health behaviors often serves as a key influence in propensity to engage or not engage in screening behaviors. Though this link has been demonstrated in many populations, the current study will elucidate the importance of the construct in Latina women.

Subjective Norms: Marianismo and Acculturation

Marianismo is the feminine gender role in Latin cultures (Castillo et al., 2010). Examples of marianismo include placing the needs of others before one’s own, modesty, and maintaining a “strict code of conduct when it comes to sexuality” (Castillo et al., 2010). Machismo is a description of gender norms in Latino cultures (Dewey, 2016). The term can refer to both positive and negative aspects of masculinity. Some examples of machismo behavior are jealousy in relationships and feeling responsible for providing for

one's family. The Machismo culture influences not only men, but cultural attitudes toward women, healthcare, and other societal issues, as detailed below.

Much of the research on the influence of machismo and marianismo in healthcare that has been conducted thus far has been qualitative in nature and consists of focus groups and individual interviews. A meta-synthesis of 9 studies on cervical cancer perceptions in Latina women found that cultural expectations regarding appropriate health behaviors for women impacted their personal views on screening, its facilitators, and its barriers (Corcoran & Crowley, 2014). For example, participants across studies mentioned modesty and their significant other's negative perceptions of receiving a pap test (both factors that pertain to marianismo) as deterrents to being screened for cervical cancer. More recent studies have found similar results. One such study used focus groups centered on discussing cervical cancer screening facilitators and barriers in Hispanic women originating from a variety of Latin American countries (Madhivanan et al., 2016). Out of the six groups, four groups mentioned the influence of machismo on attitudes toward cervical cancer screening. For example, one participant mentioned her husband's jealousy as a barrier to receiving healthcare, while another stated that her husband's support had given her confidence to reach out for health care. Additionally, all groups mentioned the role of family members as vital to making healthcare decisions. Though family members were mentioned as positive supports, half of groups mentioned that women place the health of family members over their own, reflecting the impact the cultural concept of marianismo has on health behaviors. Another focus group study with male and female participants mentioned a different aspect of machismo (Fernandez et al., 2009). The male participant stated that their first likely reaction would be to question the

fidelity of their partner and blame the woman if she were to contract HPV (a common precursor to cervical cancer). Congruently, women expressed the idea that a male partner would be very angry with their female partner if she were to disclose HPV-positive status, and that the male would “possibly abandon” them.

Cultural norms similar to *marianismo* in Latina women have been implicated in many of the disparities present in health screening behaviors of other populations. For example, Vu et al. (2016) found that American Muslim women would delay receiving healthcare for reasons associated with their religious beliefs, including preserving modesty, as well as a preference for practitioners of the same gender. Previous literature has shown that cultural influences are important in healthcare behaviors, and the current study will extend that knowledge to Latina women by considering the cultural norm of *marinaismo* in the context of cervical cancer screening.

Acculturation is the process by which a person adapts to the values and behaviors of another culture (Zea et al., 2003). Acculturation has been shown to influence cervical cancer screening in previous samples of Hispanic American women (Roncancio et al., 2013; Shah et al., 2006). Specifically, women who report higher levels of acculturation to American culture are more likely to have ever had a pap test. Acculturation will be included as a measure of subjective norms.

Behavioral Control: Health Literacy and Self-Efficacy

Factors concerning the perceived control of the individual in healthcare circumstances, such as health literacy and self-efficacy, appear to be an important predictor of receiving pap testing among many ethnic groups.

Health literacy concerns the ability of an individual to make informed decisions concerning their healthcare (Logan, Press, & Siegel, 2017). This ability encompasses an understanding of the intricacies of the healthcare system, knowledge concerning which procedures would be necessary for the individual, and the ability to synthesize this knowledge to assist the individual in making health care decisions (Logan et al., 2017). Because this ability concerns a belief that one is able to take responsibility for their health, it would be considered a behavioral control factor in the TPB framework. Only one previous study has addressed the linkage between health literacy and pap testing among Hispanic women. In this sample of older Latina women living in New York City, women with lower health literacy were significantly less likely to have ever had a pap test than those with adequate or higher literacy level (Garbers et al., 2004).

Self-efficacy is another concept that would fall under the umbrella of perceived behavioral control within the TPB framework. Self-efficacy can be defined as an individual's belief that they can engage in an action necessary to achieve their goal in a specific circumstance (Yancey, 2013). Previous literature has tied the presence of self-efficacy to cervical cancer screening intention within the Hispanic population (Fernandez et al., 2009; Guntzviller et al., 2017; Moore de Peralta, Holaday, & McDonell, 2015). This relationship has been examined in both naturalistic environments as well as in experimentally-induced lab settings. For example, one study found that Latina women who endorsed higher self-efficacy were more likely to have had a pap test than those who indicated low levels of self-efficacy (Fernandez et al., 2009). A recent study by Kim and Hmielowski (2017) also demonstrated the impact of self-efficacy on health behaviors experimentally by exposing two groups of undergraduate women to television messages

designed to either increase or decrease cervical cancer related self-efficacy. Participants in the high self-efficacy group endorsed greater intention to participate in preventative measures such as pap smear and HPV vaccination (Kim & Hmielowski, 2017)

Though the concepts of self-efficacy and health literacy are distinct, both would fall under the umbrella of perceived behavioral control within the TPB framework, as both are concepts that influence an individual's perceived ability to engage in cervical cancer screening behavior. Additionally, these two factors have been shown to correlate with each other in past research, which supports the idea that self-efficacy and health literacy are important to consider in tandem. For example, in a sample of Korean women currently residing in the United States, health literacy alone did not significantly predict pap test usage, but the relationship became significant once self-efficacy was added as mediator between the two (Kim, 2018). The previous literature on these perceived behavioral control factors has demonstrated that they have a significant effect on both perceptions of ability to engage in healthcare related behaviors, and that these perceptions affect actual behavior.

Current Study

The current study used the Theory of Planned Behavior to examine the influences of individual attitudes (i.e., medical embarrassment), subjective norms (i.e., marianismo), and control beliefs (i.e., self-efficacy and health literacy) on cervical cancer screening intentions in Latinas. I hypothesized that each factor would have an influence on the intention to engage in pap testing as recommended in ACS guidelines, and that the combined effects of the factors would be more influential than any particular factor by itself. Specifically, I hypothesized that the participants most likely to endorse intending to

receive a pap smear according to ACS guidelines would report low reported medical embarrassment, low identification with the cultural construct of marianismo, high self-efficacy, and high cervical cancer screening knowledge. This study will contribute to the growing knowledge of cervical cancer screening in this understudied population. Any significant results can be used to tailor interventions to target those most at risk of not getting tested, increase rates of screening, and ultimately prevent the unnecessary deaths of thousands of Latina-American women each year.

CHAPTER II

Methods

Participants

Female participants aged 23-65 literate in English and/or Spanish were recruited from Amazon Mechanical Turk (MTurk), an online platform offering crowdsourcing services for tasks that require human intelligence, such as online surveys. To be eligible for the current study, participants also had to reside within the United States. These inclusion criteria were accounted for by self-report within the Qualtrics survey. Only female participants of Hispanic and/or Latina ethnicity are included in the analyses of this study. Prior to engaging in any study-related procedures, each participant was presented with information concerning the potential risks and benefits of engaging in the research and was then prompted to provide informed consent.

Procedure

Participants were recruited from MTurk. Previous literature has found that the online platform provides data that is equivalent or surpasses the reliability of data obtained by traditional means (Buhrmester, Kwang, & Gosling, 2011). MTurk has been used extensively in the medical and psychological research realm with success (Arch, 2017; Mortensen, 2018). Specifically, MTurk facilitates the recruitment of a diverse and representative sample in very short time period, and offers both participants and researchers the convenience of completing study-related tasks in a familiar environment at an acceptable time to the participant (Mortensen, 2018).

After providing consent via an electronic consent form, participants were prompted to provide basic demographic information such as gender, age, race, ethnicity,

generational status, and length of time residing in the United States. If a participant reported age, gender, ethnicity, or country of residence outside the inclusion criteria range they were thanked for their participation, and the survey ended.

Once eligibility was confirmed, each participant was administered the study instruments (detailed below) via Qualtrics. To account for possible order effects, study measures (with the exception of the demographic questionnaire, questions concerning screening intentions, and a question concerning past screening behavior) were presented in a counterbalanced order.

Measures

Potential Covariates: Demographics and Past Cervical Cancer Screening Behavior

Participants provided their sex at birth, identified gender, race, ethnicity, age, income level, insurance status, country of origin, years in the United States, and history of pap testing. Because of the possible influence of questions concerning past testing on the endorsement of intention (see below), this question was asked after all measures and questions concerning future intention were completed.

The presence of past cervical cancer screening was assessed by the use of the following questions based on current ACS guidelines. For participants 21-30, past screening behavior was assessed with the question “Have you obtained a pap test within the past 3 years”, with response options of “yes” and “no”. Participants ages 30-65 were asked two questions: “Have you obtained a pap test within the past 5 years?”, with response options of “yes” or “no” and “was your pap test combined with a human papillomavirus test (HPV test)? (“yes”, “no”, or “not applicable, I haven’t had a pap test in the last 5 years”). As past screening behavior has been found to be predictive of

screening intentions, this measure will be included as a covariate in analyses if it found to be associated with any study variable.

Cervical cancer screening guideline knowledge was assessed using 4 fill-in-the-blank questions based on ACS/USPTF cervical cancer screening guidelines. These questions were “All women should begin cervical cancer screening at age ___”, “Women aged 21 to 29 should have a Pap test every ___ years. HPV testing should not be used for screening in this age group”, “Beginning at age 30, the preferred way to screen is with a Pap test combined with an HPV test every ___ years. This is called co-testing and should continue until age 65”, and “Another reasonable option for women aged 30-65 is to get tested every ___ years with just the pap test”.

Outcome Variable: Pap Test Intention

Intention of receiving future pap testing on schedule was the dependent variable in the present study. This was assessed using 2 questions: “I intend to have a pap exam in the next year” and “I plan to have a pap exam in the next year”. These items were presented on a 5-point Likert scale, with anchors of “strongly disagree” and “strongly agree” (Roncancio et al., 2013).

Attitudes: Medical Embarrassment Questionnaire

The Medical Embarrassment Questionnaire (MEQ) consists of 53 items measuring medical embarrassment, a concept that is correlated but distinct from trait embarrassability (Consedine et al., 2007). In the validation study, items were categorized into 3 subscales concerning bodily embarrassment, judgment concerns, and comfort with medical examinations. The current study used two of the subscales, bodily embarrassment and judgment concerns, during primary analyses. As the third subscale

obtained an α of .55 in the validation study, it was not included in the current study. Item responses were presented as a Likert scale ranging from 1 to 5, with 1 meaning “Not at All/Never” and 5 meaning “Very Much/Always.” The MEQ was included as a measure of attitude within the TPB framework.

Subjective Norms: Marianismo Beliefs Scale

The Marianismo Beliefs Scale (MBS) consists of 24 items developed to measure endorsement of cultural values within the Latino/a community (Castillo et al., 2010). The scale was originally validated within a sample of students attending a Latino university and has subsequently been adapted for use in adolescents (Piña-Watson et al., 2014). Item responses are based on a Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). Items from the scale are categorized under 5 subscales: family pillar, virtuous and chaste, subordinate to others, silencing self to maintain harmony, and spiritual pillar. The current study included all 5 subscales. The measure has demonstrated adequate convergent validity with other measures of enculturation such as the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II), and Multiphasic Assessment of Cultural Constructs- Short Form (MACC-SF) in previous studies (Castillo et al., 2010). The MBS was included as a measure of subjective norms.

Subjective Norms: Abbreviated Multidimensional Acculturation Scale

The Abbreviated Multidimensional Acculturation Scale (AMAS-ZABB) consists of 42 items measuring United States acculturation and acculturation to a generic culture of origin (Zea et al., 2003). The scale was developed in a college sample, and subsequently validated in a community sample of Latino/a participants. Items were presented on a Likert scale of 1 (Not at all) to 4 (Extremely well). Items are categorized

into 3 subscales: language competence, cultural competence, and cultural identity. The total U.S. acculturation scale was computed from the average score of the three subscales. To reduce participant burden due to the length of questionnaires, only the United States acculturation subscales were measured in the current study. The AMAS-ZABB was included as a measure of subjective norms.

Behavioral Control: CHLT-30

The Cancer Health Literacy Questionnaire (CHLT-30) consists of thirty items that assess health literacy (Dumenci et al., 2014). The measure was later translated and validated in Spanish-speaking participants (Echeverri, Anderson, & Nápoles, 2016). The CHLT-30 is a unidimensional measure of cancer health literacy. The measure presents items as multiple-choice questions with 2-3 possible answers to choose from. Scores on this measure were significantly correlated with scores on the REALM and S-TOFHLA (other measures of health literacy) within the validation sample. However, unlike the REALM and S-TOFHLA, scores on the CHLT-30 were able to significantly predict self-confidence in engaging in health decision-making. The CHLT-30 was included as a measure of health literacy. The measure demonstrated good internal consistency ($\alpha = 0.88$) within the development sample. The CHLT-30 was included as a measure of perceived behavioral control.

Behavioral Control: Cervical Cancer Self-Efficacy Scale

The cervical cancer self-efficacy scale (CC-SES) is a unidimensional scale composed of 8 items that measure an individual's perceived ability to obtain a pap smear (Fernandez et al., 2009). Each item measures whether the participant believes that they can obtain a pap smear under certain circumstances on a 5-point Likert scale, ranging

from “very sure” to “very unsure”. Because the measure was originally validated within a Mexican American population endorsing a variety of demographic features (income, age, country of origin and length of residency in the US), this measure is ideal for use within the current sample. The SES was included as a measure of perceived behavioral control.

Statistical Analysis

Data was screened for outliers and missing data. Less than 0.5% of data were missing in total, with a maximum of 2 items missing for any individual participant. Because it might be extraneous to use a technique such as multiple imputation in this instance, the mean of the subscale or scale from which the item was missing was used to fill in the missing item. Box plots were used to screen for outliers within the data. If an outlier was determined to have impact on the results of any analyses, results are reported with and without the inclusion of the outlier(s). The Kolmogorov-Smirnov test of normality was used for predictor variables, and the skewness and kurtosis of predictor variables was examined.

SEM was will be used to create latent constructs for attitudes, subjective norms, and perceived behavioral control, which would have been used to predict cervical cancer screening intention rates. However, the use of SEM was not feasible given the small sample size. Since the use of SEM was not feasible, hierarchical linear regressions were conducted within SPSS. Covariates (e.g., demographic or past screening behavior) found to be associated with cervical cancer screening intentions at the $p < .05$ level were included in the first model. Due to strong predictive value of perceived behavioral control in previous research, perceived behavioral control will be added in the subsequent model, then attitude and subjective norm variables will be added in the last model.

CHAPTER III

Results

A total of 149 participants completed the study surveys. 100 responses were in English, and the other 49 were in Spanish. Demographic variables for each group are presented in Table 1. Compared to English-language respondents, Spanish-speaking respondents were more likely to be older ($p = .011$), born in a country other than the USA ($p < .000$), and to have resided in the United States for a shorter length of time ($p = .009$). Of participants born in other countries, the majority were born in Mexico ($n = 11$ in the English sample; $n = 10$ in the Spanish sample). Other countries of birth included Guatemala, Salvador, Dominican Republic, Peru, and a category of “other” for countries outside of these options. Because a number of the countries had only a single response, country of origin was dichotomized into “USA” and “Other”. Spanish-speaking participants also scored differently than English-speaking participants on a number of study measures. Specifically, Spanish-speaking respondents scored lower on the CHLT ($p < .000$), AMAS Total ($p = .011$), and AMAS English language subscale ($p < .000$). Additionally, Spanish-speaking participants reported lower cervical cancer screening self-efficacy (SES; $p < .000$), lower rates of silencing themselves to maintain harmony in their families (MBS Silencing Self; $p = .038$), higher feelings of being a pillar for their family (MBS Family Pillar; $p = .008$), and lower levels of bodily embarrassment (MEQ Bodily Embarrassment; $p = .016$). There was no significant difference in generational status or cervical cancer screening intentions independently of other variables between the two samples. However, due to the significant differences between the two samples, results were assessed separately.

Structural Equation Modelling

Latent variables were created for attitudes (MEQ Bodily Embarrassment, MEQ Social Judgement), subjective norms (MBS Family Pillar, MBS Virtuous and Chaste, MBS Subordinate to Others, MBS Self-silencing to Maintain Harmony, MBS Spiritual Pillar, AMAS English Language, AMAS US Identification, AMAS US Competence), and perceived behavioral control (SES, CHLT) within MPlus Version 8 (Muthén & Muthén, 2017). However, MPlus identified issues with non-positive definite values within both the Spanish and English samples, which can occur when there are only 2 measured variables under a latent construct. Due to the relatively small sample sizes obtained and the necessity of analyzing English and Spanish results separately due to differences between the samples, I conducted hierarchical linear regressions within SPSS to examine the separate and collaborative effects of attitudes (measured by 2 subscales of MEQ), subjective norms (measured by 5 subscales of MBS and AMAS total score), and perceived behavioral control (measured by CHLT and SES) on cervical cancer screening intentions.

Results for English-Speaking Sample

Reliability Analyses

Psychometric properties of study measures within the English sample are presented in Table 2. With the exception of the CHLT, reliability coefficients were in the good to excellent range. The AMAS English language subscale had significant skew and kurtosis; all other study measures were within acceptable ranges for normality.

Correlations between study measures.

Correlations between study measures are presented in Table 3. In short, many study variables were correlated with each other. Because of this, VIF was considered when completing the hierarchical linear regressions. A number of subscales were above the threshold of 4. Because its VIF was the highest within the MBS, the MBS Subordinate to others subscale was removed. Using the same logic, the Social Judgement subscale of the MEQ was removed from the model. After these subscales were removed, all VIF values were under 4.

Past screening compliance and screening guideline knowledge in the English sample.

A slight majority of participants ($n = 60, 60\%$) in the English-speaking sample endorsed past screening behavior that complies with cervical cancer screening guidelines. Overall, knowledge of screening guidelines in the sample was poor; only 23% ($n=23$) were aware that women should begin cervical cancer screening at age 21, 36% were aware that women between ages 21 and 29 should be screened with a pap test every 3 years, 19% were aware that women ages 30-65 should obtain a cervical cancer screening test along with an HPV test every 5 years, and 20% were aware that an additional screening option for older women is to receive a cervical cancer screening test every 3 years.

Predicting screening intentions in the English sample.

Linear regressions were used to test the predictive value of each demographic variable regarding cervical cancer screening intention. Results are presented in Table 4. Only country of birth was found to significantly predict cervical cancer screening intentions ($p=.01$), so all English sample analyses include country of birth as a covariate.

One outlier was found on the CHLT, three outliers on the SES, two outliers on the MBS family subscale, four outliers on the US identity subscale of the AMAS, one outlier on the US Competence subscale of the AMAS, and one outlier on the AMAS total score. None of these values were extreme outliers. However, the AMAS English subscale had 14 outliers, all of which were extreme. Because of these outliers and the redundancy of using subscales as well as a total measure, only the AMAS total scale was used. No significant differences in results were present when excluding outliers; all English sample results presented are with the inclusion of outliers.

Hierarchical linear regression was used to determine the effects of each study variable on cervical cancer screening intentions. Country of birth was added in step 1 of the regression, measures of perceived behavioral control (SES, CHLT) were added in step 2, and measures of attitude (MEQ Bodily Embarrassment) and subjective norms (4 MBS subscales and AMAS total score) were added in step 3.

Only 6.6% of the variance in cervical cancer screening intention was explained by country of birth alone. When perceived behavioral control measures (SES, CHLT) were added in the second model, they increased the amount of variance accounted for by 14% up to 20.6%. The second model significantly predicted cervical cancer screening intentions ($R^2 = .206$, $F(3, 96) = 4.695$, $p = .012$, $adjusted R^2 = .325$). In this model, country of origin ($\beta = -.245$ $p = .049$) and SES score ($\beta = .373$ $p = .01$) were all significant positive predictors of intention, independent of each other.

While the addition of other study variables increased the variance accounted for within the model by 14.8%, up to 35.4%, the predictive utility of the model was not significantly greater than that of the second model ($R^2 = .562$, $F(9, 14) = 1.992$, $p > .05$,

*adjusted R*² = .280). In this model, CHLT remained a significant positive predictor of intention ($p = .031$), but no other variables significantly predicted cervical cancer screening intentions.

Results for Spanish-Speaking Sample

Reliability analyses

Psychometric properties of study instruments within the Spanish sample are noted in Table 5. All study instruments demonstrated fair to excellent internal consistency. Notably, the CHLT demonstrated significantly greater reliability within the Spanish-speaking sample than within the English-speaking sample. No measure indicated significant skew or kurtosis.

Correlations between study measures.

Intercorrelations between study measures within the Spanish-speaking sample are noted in Table 6. There were considerable associations between study measures (most notably between the MBS Family Pillar subscale and the AMAS subscales and total scale score), so VIF was considered when interpreting the results of the original model. Because VIF values noted significant overlap between the two MEQ subscales, the MEQ Social Judgment subscale was removed from the model. Once this was done, all VIF values were below 4.

Past screening compliance and screening guideline knowledge in the Spanish sample

A slight majority of participants ($n = 32, 65.3\%$) in the Spanish-speaking sample endorsed past screening behavior that complies with cervical cancer screening guidelines. Overall, knowledge of screening guidelines in the sample was poor; only 24.5% ($n=12$) were aware that women should begin cervical cancer screening at age 21, 10.2% were

aware that women between ages 21 and 29 should be screened with a pap test every 3 years, 16.3% were aware that women ages 30-65 should obtain a cervical cancer screening test along with an HPV test every 5 years, and 16.3% were aware that an additional screening option for older women is to receive a cervical cancer screening test every 3 years.

Predicting screening intentions in the Spanish-Speaking sample

A process identical to that described above for the English sample was used to analyze the data from the Spanish speaking sample. One outlier was found in the CHLT, five outliers in the SES, two outliers in the MBS Family Pillar subscale, one outlier in the MBS Subordinate to Others subscale, and one outlier in the English Language subscale of the AMAS. None of these were extreme outliers. Notably, there were differences between the results within the Spanish model with the exclusion of outliers. Thus, results both with outliers in Table 7, and without outliers in Table 8. For brevity, correlations between study measures and psychometric properties of study instruments were presented only once above, with outliers.

Additionally, no demographic measure was significantly correlated with intention to receive cervical cancer screening within the Spanish-speaking sample. Thus, perceived behavioral control variables (CHLT, SES) were added in step 1 of the hierarchical linear regression, and attitude (MEQ Bodily Embarrassment) and subjective norm variables (5 MBS subscales and 3 AMAS subscales) were added in step 2.

Spanish sample model results with inclusion of outliers

14.6% of the variance in cervical cancer screening intentions was explained by perceived behavioral control. Specifically, SES score ($\beta = -.398$ $p = .022$) was a

significant predictor of intention. Once other study variables were included, the final model accounted 45.1% of the variance, a statistically significant increase ($R^2 = .451$, $F_{(9, 37)} = 2.766$, $p = .037$, *adjusted R2* = .288). In the final model, only the MBS Virtuous and Chaste subscale ($\beta = .358$, $p = .039$) was a significant predictor of screening intentions independent from other predictors. However, additional subjective norm predictors were marginally significant (MBS Subordinate to Others subscale, $p = .055$; MBS Family Pillar subscale, $p = .063$).

Spanish sample model results without inclusion of outliers.

In the Spanish-speaking model without the inclusion of outliers, 19.5% of the variance was explained by perceived behavioral control, a slight improvement over the model with inclusion of outliers. Specifically, SES score ($\beta = -.438$, $p = .003$) was a significant predictor of intention. However, once all predictors were included in the second model, only 34.2% of the variance was accounted for, a level below that of the Spanish-speaking participant model including outliers. Additionally, the second model including all study variables was not significantly better at predicting cervical cancer screening intentions than the first model ($R^2 = .342$, $F_{(9, 33)} = 1.561$, $p > .05$, *adjusted R2* = .123).

Table 1

Demographics of Study Participants

| Variable | <u>English</u> (n=100) | | <u>Spanish</u> (n=48) | | |
|------------------------------------|--|------------|--------------------------|------------|------|
| | Frequency | Percentage | Frequency | Percentage | |
| Age | | | | | |
| | 23-30 | 52 | 52 | 21 | 42.9 |
| | 30-40 | 31 | 31 | 10 | 20.4 |
| | 40-50 | 12 | 12 | 8 | 16.3 |
| | 50-65 | 5 | 5 | 10 | 20.4 |
| Country of Origin | | | | | |
| | USA | 76 | 76 | 28 | 57.1 |
| | Other | 24 | 24 | 21 | 42.9 |
| Years of US Residency ^a | | | | | |
| | 1-5 | 0 | 0 | 3 | 6.1 |
| | 6-15 | 3 | 3 | 10 | 20.4 |
| | 16-25 | 4 | 4 | 2 | 4.1 |
| | 25+ | 17 | 17 | 12 | 24.5 |
| Generational Status | | | | | |
| | 1 st Generation | 38 | 38 | 27 | 55.1 |
| | 2 nd Generation | 27 | 27 | 14 | 28.6 |
| | 3 rd or Subsequent Generation | 35 | 35 | 8 | 16.3 |

Note: ^ayears of US Residency was only asked of the 24 participants not born in the USA

Table 2

Psychometric Information for Study Measures: English-Speaking Sample

| Scale | Alpha | Mean (SD) | Skew | Kurtosis | Range |
|------------------|-------|--------------|--------|----------|---------------|
| MEQ Bodily | .96 | 2.98 (.93) | -.153 | -.385 | 4 (1–5) |
| MEQ Judgement | .91 | 2.44 (.82) | .166 | -.459 | 3.58 (1–4.58) |
| MBS Spirit | .93 | 6.90 (2.85) | .100 | -1.178 | 9 (3–12) |
| MBS Family | .84 | 15.30 (2.69) | .003 | -.261 | 11 (9–20) |
| MBS Virtuous | .84 | 13.34 (3.51) | .045 | -.752 | 13 (7–20) |
| MBS Subordinate | .90 | 9.59 (3.48) | .437 | -.453 | 13 (5–18) |
| MBS Silence | .93 | 10.19 (4.00) | .726 | -.265 | 16 (6–22) |
| AMAS Total | .99 | 3.41 (.42) | -.701 | .581 | 2.06 (1.94–4) |
| AMAS Language | .92 | 3.90 (.28) | -2.962 | 7.826 | 1.33 (2.67–4) |
| AMAS US Identity | .95 | 3.26 (.78) | -1.204 | .958 | 3 (1–4) |
| AMAS Competence | .90 | 3.08 (.63) | -.423 | .083 | 3 (1–4) |
| SES | .92 | 3.99 (.77) | -.858 | .241 | 3.75 (1.25–5) |
| CHLT-30 | .43 | 17.73 (2.46) | -.927 | .099 | 12 (10–22) |

Note. MEQ = Medical Embarrassment Questionnaire, MBS = Marianismo Beliefs Scale, AMAS = Abbreviated Multidimensional Acculturation Scale, SES = Cervical Cancer Self Efficacy Scale, CHLT-30 = Cancer Health Literacy Test-30

Table 3

Intercorrelations Between Study Measures with outliers: English-Speaking Sample

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|--------------------|-------------|-------------|------------|------------|-------------|------------|-------------|------------|------------|------------|-----|-----|----|
| 1. MEQ Bodily | 1 | | | | | | | | | | | | |
| 2. MEQ Judgement | .60 | 1 | | | | | | | | | | | |
| 3. MBS Spirit | .18 | .17 | 1 | | | | | | | | | | |
| 4. MBS Family | .25 | .14 | .57 | 1 | | | | | | | | | |
| 5. MBS Silence | .14 | .32 | .54 | .17 | 1 | | | | | | | | |
| 6. MBS Virtuous | .26 | .23 | .74 | .51 | .54 | 1 | | | | | | | |
| 7. MBS Subordinate | .01 | .30 | .56 | .17 | .83 | .59 | 1 | | | | | | |
| 8. AMAS English | -.13 | -.25 | .01 | .12 | -.32 | -.05 | -.33 | 1 | | | | | |
| 9. AMAS USID | -.03 | -.09 | .26 | .32 | .20 | .26 | .21 | .12 | 1 | | | | |
| 10. AMAS US Comp | -.06 | -.18 | .10 | .21 | -.09 | .04 | -.09 | .33 | .35 | 1 | | | |
| 11. AMAS Total | -.08 | -.20 | .21 | .33 | .01 | .17 | .02 | .46 | .82 | .79 | 1 | | |
| 12. CHLT | .01 | -.19 | -.09 | -.06 | -.27 | -.14 | -.32 | .37 | -.13 | .09 | .05 | 1 | |
| 13. SES | -.40 | -.35 | -.03 | .10 | -.26 | -.18 | -.21 | .24 | .12 | .15 | .20 | .20 | 1 |

Note. *italicized* $p \leq .05$, **bold** $p \leq .01$.

Table 4

*Hierarchical Multiple Regression Predicting Cervical Cancer Screening Intentions:**English-Speaking Sample*

| Predictor | <u>Model 1</u> | | <u>Model 2</u> | | <u>Model 3</u> | |
|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | B | β | B | β | B | β |
| Step 1 | | | | | | |
| Country of Origin | -.652** | -.257** | -.623** | -.245** | -.599* | -.236* |
| Step 2 | | | | | | |
| SES | | | .531** | .373** | .416** | .292** |
| CHLT | | | -.069 | -.156 | -.072 | -.161 |
| Step 3 | | | | | | |
| MBS Family | | | | | .120* | .302* |
| MBS Virtuous | | | | | -.080 | -.258 |
| MBS Silence | | | | | -.010 | -.038 |
| MBS Spirit | | | | | .047 | .123 |
| MEQ Bodily | | | | | .037 | .032 |
| AMAS Total | | | | | .134 | .052 |
| | | <u>Model 1</u> | | <u>Model 2</u> | | <u>Model 3</u> |
| R ² | | .066 | | .206 | | .304 |
| F | | 6.918** | | 8.287** | | 4.370** |
| ΔR^2 | | | | .140 | | .098 |
| ΔF | | | | 8.460** | | 2.117 |

Note. * $p \leq .05$, ** $p \leq .01$.

Table 5

Psychometric Information for Study Variables: Spanish-Speaking Sample

| Scale | Alpha | Mean (SD) | Skew | Kurtosis | Range |
|------------------|-------|--------------|--------|----------|---------------|
| MEQ Bodily | .97 | 2.56 (1.09) | .157 | -.935 | 3.79 (1–4.79) |
| MEQ Judgement | .93 | 2.13 (.931) | .355 | -1.120 | 3.08 (1–4.08) |
| MBS Spirit | .82 | 7.53 (2.32) | -.546 | -.372 | 9 (3–12) |
| MBS Family | .84 | 16.63 (2.74) | -1.46 | 3.34 | 13 (7–20) |
| MBS Virtuous | .76 | 14.51 (3.41) | -.481 | .106 | 15 (5–20) |
| MBS Subordinate | .81 | 9.18 (3.33) | .839 | .998 | 15 (5–20) |
| MBS Silence | .73 | 8.84 (3.00) | .940 | -.109 | 10 (6–16) |
| AMAS Total | .96 | 3.21 (.619) | -.689 | -.293 | 2.41 (1.59–4) |
| AMAS Language | .97 | 3.47 (.77) | -1.424 | 1.087 | 2.89 (1.1–4) |
| AMAS US Identity | .86 | 3.15 (.68) | -.562 | -.187 | 2.5 (1.5–4) |
| AMAS Competence | .95 | 2.97 (.83) | -.281 | -1.135 | 2.67 (1.34) |
| SES | .97 | 1.80 (1.00) | 1.487 | 1.306 | 3.63 (1–4.63) |
| CHLT-30 | .72 | 14.04 (3.54) | -1.224 | 1.711 | 17 (2–19) |

Table 6

Intercorrelations Between Study Measures with outliers: Spanish-Speaking Sample

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|--------------------|------------|------------|-----|------------|------------|------|------|------------|------------|------------|------|-----|----|
| 1. MEQ Bodily | 1 | | | | | | | | | | | | |
| 2. MEQ Judgement | .79 | 1 | | | | | | | | | | | |
| 3. MBS Spirit | .13 | .18 | 1 | | | | | | | | | | |
| 4. MBS Family | .01 | -.15 | .35 | 1 | | | | | | | | | |
| 5. MBS Silence | .19 | .20 | .34 | -.20 | 1 | | | | | | | | |
| 6. MBS Virtuous | .26 | .17 | .38 | .45 | .02 | 1 | | | | | | | |
| 7. MBS Subordinate | .09 | .24 | .36 | .10 | .59 | .27 | 1 | | | | | | |
| 8. AMAS English | -.07 | .01 | .25 | .26 | -.03 | -.06 | .16 | 1 | | | | | |
| 9. AMAS USID | .07 | -.12 | .18 | .49 | .03 | .12 | .24 | .37 | 1 | | | | |
| 10. AMAS US Comp | -.20 | -.09 | .26 | .32 | -.03 | -.09 | .19 | .70 | .91 | 1 | | | |
| 11. AMAS Total | -.09 | -.07 | .28 | .42 | -.01 | -.02 | .23 | .85 | .73 | .91 | 1 | | |
| 12. CHLT | .02 | .00 | .00 | .21 | -.14 | .15 | -.18 | .29 | .36 | .24 | .35 | 1 | |
| 13. SES | <i>.31</i> | .29 | .04 | -.03 | <i>.31</i> | .15 | .26 | -.16 | .01 | -.21 | -.15 | .04 | 1 |

Note. *italicized* $p \leq .05$, **bold** $p \leq .0$

Table 7

Hierarchical Multiple Regression Predicting Cervical Cancer Screening: Spanish-Speaking Sample with Outliers Included

| Predictor | <u>Model 1</u> | | <u>Model 2</u> | |
|-------------------|----------------|----------------|----------------|----------------|
| | B | β | B | β |
| Step 1 | | | | |
| SES | .398* | .324* | .289 | .236 |
| CHLT | .075 | .215 | -.016 | -.045 |
| Step 2 | | | | |
| MBS Family | | | .149 | .331 |
| MBS Virtuous | | | .129* | .358* |
| MBS Silence | | | .044 | .108 |
| MBS Spirit | | | -.073 | -.136 |
| MBS Subordinate | | | -.135 | -.364 |
| MEQ Bodily | | | -.151 | -.132 |
| AMAS US Comp | | | .000 | .000 |
| AMAS USID | | | .267 | .147 |
| AMAS English Lang | | | .180 | .115 |
| | | <u>Model 1</u> | | <u>Model 1</u> |
| R ² | | .146 | | .451 |
| F | | 3.932** | | 2.766** |
| ΔR^2 | | - | | .305 |
| ΔF | | - | | 2.287 |

Note. * $p \leq .05$, ** $p \leq .01$.

Table 8

Hierarchical Multiple Regression Predicting Cervical Cancer Screening: Spanish-Speaking Sample without Outliers Included

| Predictor | <u>Model 1</u> | | <u>Model 2</u> | |
|------------------------|----------------|----------------|----------------|---------|
| | B | β | B | β |
| Step 1 | | | | |
| SES | .473** | .438** | .311 | .288 |
| CHLT | -.030 | -.072 | -.047 | -.111 |
| Step 2 | | | | |
| MBS Family | | | .070 | .126 |
| MBS V&C | | | .101 | .274 |
| MBS Silence | | | .026 | .069 |
| MBS Spirit | | | -.045 | -.088 |
| MBS Subordinate | | | -.120 | -.316 |
| MEQ Bodily | | | -.156 | -.153 |
| AMAS US Competence | | | -.004 | -.003 |
| AMAS US Identification | | | .254 | .132 |
| AMAS English Lang | | | .244 | .155 |
| | | <u>Model 1</u> | <u>Model 2</u> | |
| R ² | | .195 | .342 | |
| F | | 5.083* | 1.709 | |
| ΔR^2 | | - | .147 | |
| ΔF | | - | .821 | |

Note. * $p \leq .05$, ** $p \leq .01$.

CHAPTER IV

Discussion

The purpose of the current study was to determine the individual and combined effects of attitudes (medical embarrassment), subjective norms (marianismo beliefs and acculturation), and perceived behavioral control (cervical cancer screening self-efficacy and health literacy) on cervical cancer screening intentions in Hispanic women living in the United States. The results differed based on the spoken language of the sample. While cervical cancer screening intentions in English-speaking women were highly dependent on country of origin, Spanish-speaking women were not significantly more or less likely to intend to receive cervical cancer screening based on country of birth. Perceived behavioral control, specifically cervical cancer screening self-efficacy, was predictive of cervical cancer screening in the English-speaking sample. However, self-efficacy fell below the threshold for significance in the final model for Spanish-speaking participants. In models including all study variables, subjective norms also predicted screening behaviors. Specifically, beliefs that women should be a pillar of support for the family were predictive of cervical cancer screening intentions in English-speaking women, and beliefs that women should remain virtuous and chaste were predictive of cervical cancer screening intentions in Spanish-speaking women. Attitudes, specifically medical embarrassment, were not related to cervical cancer screening intentions.

Interestingly, past screening behavior was not associated with current screening intention. This is inconsistent the TPB premise that intention and behavior are highly correlated at .48 (Starfelt-Sutton & White, 2016). One reason for this might be misunderstanding about how often cervical cancer screening is required; specifically,

women may not intend to receive additional screening due to the fact that they have already been screened in the past, and thus believe that they do not need to be re-screened again in the future. This is supported by the data showing both high levels of past screening compliance and low levels of screening guideline knowledge. Another explanation could be uni-directionality of the relationship between intention and behavior. In the TPB model, intention is typically used to predict future behavior. Because the current study measured past behavior, changes in intention could have occurred between the last cervical cancer screening test and the current study assessment. For example, one could have had high intentions to receive screening when they received their past test, but due to detrimental experiences or other factors, current screening intentions could differ from intentions that motivated the past screening behavior. In short, it theoretically makes sense that intention would predict behavior, but not vice versa.

Overall, the results did not support the hypothesis that perceived behavioral control would be more predictive of cervical cancer screening intentions than other variables studied. Additionally, the hypothesis that each variable would contribute slightly better predictability of cervical cancer screening as it was added to the model was not supported. This may be due to the fact that study measures in the current study overall were less specific to the context of cervical cancer screening than measures used in previous studies. For example, the one-question measure of subjective norms in Ronancino et al. (2006) asked “most people who are important to me think that I should not have a Pap exam in the next year”; similarly, all TPB questions asked by Ogilvie et al. (2016) were highly specific to cervical cancer screening. In the current study, TPB

construct measures were more distal to the topic of cervical cancer screening. While the constructs measured were suggested to have influence on cervical cancer screening in previous literature (Garbers, 2004; Madhivanan P., 2016), they may not be adequately related enough to cervical cancer screening intentions to exert a strong effect on intention to receive cervical cancer screening.

Effects of Study Variables on Cervical Cancer Screening Intentions

Attitudes

Bodily embarrassment concerns did not significantly predict cervical cancer screening intentions in either sample. This was surprising, given that previous research has supported the roles of embarrassment and discomfort around the procedure as barriers to cervical cancer screening (Glasgow et al., 2000). The role of sexual embarrassment in particular as a barrier to screening has been implicated in a number of qualitative studies (Madhivanan et al., 2016; Corcoran & Crowley, 2014). Overall bodily embarrassment scores were in the moderate range within the current sample; perhaps the influence of bodily embarrassment is only apparent when one experiences higher levels of embarrassment than those present within the current sample. Or perhaps the presence of social judgement concerns offset the influence of bodily embarrassment, as they did in the validation article for the MEQ (Consedine et al., 2007).

Subjective Norms

The present study found that subjective norms, as measured by marianismo beliefs, were associated with screening intention. However, the aspect of marianismo belief most predictive of screening intention differed by language. Specifically, being a family support was more important in predicting cervical cancer screening in English-

speaking women, whereas the importance of being virtuous and chaste was more important within Spanish-speaking women when outliers were included. Thus, cultural values were significant predictors in both the English and Spanish speaking samples, and their presentation differed based on the participants chosen language.

Previous research has demonstrated that language can be a strong indicator of acculturation, a concept intrinsically related to cultural values. That is, those who choose to speak English at home may more strongly identify with American values than those who choose to speak Spanish or another language. This idea is supported by AMAS total scores being significantly higher in the English-speaking sample than the Spanish-speaking sample. Likewise, Spanish-speaking women may more strongly identify with their Hispanic culture of origin than with American culture. One of American's most salient cultural values is the importance of family. Perhaps English-speaking women view taking care of their health as a necessary prerequisite to being able to fully support their families, and this influences their willingness to engage in cervical cancer screening. Remaining virtuous and chaste is highly valued in many Hispanic cultures (Castillo et al., 2010). The positive influence of purity beliefs and endorsement of religious values on cervical cancer screening was surprising, given previous research has implicated modesty and fears of being labelled as promiscuous as barriers to screening (Corcoran & Crowley, 2014).

The direct measure of acculturation (AMAS-ZABB) was not a significant predictor of cervical cancer screening intentions in either sample. This is in line with some previous research (Moore de Peralta, Holaday, & McDonnel, 2015) and contrary to other research (Roncancio, Ward, & Fernandez, 2016). The lack of significance may have

been due to the sole inclusion of American subscales. Important information concerning acculturation might have been missed due to the exclusion of country-of-origin subscales of the AMAS-ZABB.

Perceived Behavioral Control

Consistent with previous research, perceived behavioral control contributed more to the prediction of intentions than attitudes or subjective norms (Tung, Smith-Gagen, Lu, Warfield, 2016). While cervical cancer screening self-efficacy was predictive of increased cervical cancer screening intentions in the English-speaking sample, health literacy was not predictive in either sample. Previous literature has provided strong support for the use of self-efficacy to predict cervical cancer screening intentions (Roncancio et al., 2013; Tung et al., 2016). Combined with the strong evidence that self-efficacy predicts screening intentions, overall results for the perceived behavioral control predictors imply that the belief that one can complete a behavior plays a far more important role in intention than actual competency in health-related matters.

Country of Origin as a Predictor of Cervical Cancer Screening Intentions

Country of origin was significantly predictive of cervical cancer screening intentions within the English-speaking sample, but failed to achieve significance in the Spanish-speaking sample. Specifically, English-speaking women born in countries outside of the USA were significantly less likely to intend to receive cervical cancer screening than English-speaking women who born in the USA. This could be due to a number of factors. One could be that women who were born outside of the USA may share commonalities that were not accounted for within the current study. For example, women from different cultures may be significantly less trusting of the medical system

than those born within the USA. Another explanation could lie in differences between cervical cancer screening recommendations between countries; perhaps women who have immigrated to the United States are not aware of cervical cancer screening guidelines and are thus less likely to adhere to the recommendations. Regardless of the reason for the difference, these results suggest that physicians and lay health workers interacting with women who were born outside of the United States should be particularly mindful to encourage foreign-born women of Hispanic descent to receive cervical cancer screenings at recommended intervals. While country of origin was not a significant predictor of screening intentions in the Spanish-speaking sample, this may be due to the Spanish-speaking sample being underpowered to detect the difference.

Strengths and Limitations

A number of limitations are present in the current study. The cross-sectional design of this research limits the ability to determine whether cervical cancer screening intentions led to cervical cancer screening behavior. While previous research demonstrates that the correlation between intention and behavior is relatively high at .48 (Starfelt-Sutton & White, 2016), causality of the predictors and intention on behavior cannot be assumed based on the current study. Additionally, the current study was severely underpowered, especially within the Spanish-speaking sample. There is a chance that significant differences could not be observed due to a lack of statistical power. Difficulties recruiting Spanish-speaking participants via MTurk led to the use of TurkPrime to recruit Spanish-speaking participants. These participants were compensated at a significantly higher level (2 dollars) than English-speaking participants (50 cents). Although previous research has stated that compensation for surveys does not affect

participants' responses (Buhrmester et al., 2011), differences between users of the two platforms could have contributed to differences in results nonetheless.

Despite the flaws present, there are also many strengths in the current study. Because of the use of online crowdsourcing technology to obtain the sample, the current sample was more representative of the national population of Hispanic women, in contrast to previous research which has primarily focused on women living near the Texas/Mexico border. Additionally, this is the first study of cervical cancer screening in Hispanic women to use the current recommendations of the American Cancer Society and the Center for Disease Control and Prevention as the measure of intention for cervical cancer screening. This adds to the external validity of the results presented, and is more informative from a public health perspective than previous research that has used indicators that are not backed by scientific consensus (Roncancio, Ward, Fernandez, 2016; Ogilvie et al., 2016). Lastly, the inclusion of both English- and Spanish-speakers allows for comparison between these two groups which have not been examined in previous research.

Implications

The present study suggests that interventions focused on self-efficacy are important to increasing cervical cancer screening in both English and Spanish speaking Hispanic populations. The little research that has been done on increasing self-efficacy in this context still leaves much to be achieved. Specifically, while there has been success in increasing self-efficacy in a past intervention trial using group education for Hispanic women, this increase did not lead to increased cervical cancer screening (Luque et al., 2016). Because self-efficacy has proven to be important to cervical cancer screening both

in past research and within the current study, future effort should be focused on translating gains in self-efficacy into increased cervical cancer screening rates.

Facilitators for cervical cancer screening differ based on the spoken language of patients. While country of origin, self-efficacy, and family values were found to be particularly important predictors of screening intention among English-speaking women, beliefs in remaining virtuous and chaste were an important predictor of screening intention among Spanish speakers. Medical professionals and promotadoras (lay-people involved in promoting health within Latinx communities) should consider these differences when they encourage Hispanic women to pursue cervical cancer screening. For example, family-based interventions that involve a number of household members might be an effective way to promote cervical cancer screening in English-speaking Hispanic women.

Future studies should examine the role of sexual embarrassment in cervical cancer screening intentions. While the current study provides preliminary support of purity beliefs (e.g., being virtuous and chaste) leading to an increase in cervical cancer screening intentions within Spanish-speaking participants, the results are far from conclusive.

Lower rates of cervical cancer screening in Hispanic women continue to lead to preventable death. The results of this study can be used to inform approaches to increasing cervical cancer screening rates in both English- and Spanish-speaking Hispanic women. As racial and ethnic inequalities continue to persist and grow larger within the United States, research should continue to prioritize the amelioration of these disparities within the healthcare system as well as in society as a whole.

REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- American Cancer Society. (2018). The American Cancer Society Guidelines for the Prevention and Early Detection of Cervical Cancer. <https://www.cancer.org/cancer/cervical-cancer/prevention-and-early-detection/cervical-cancer-screening-guidelines.html>
- Arch, J., Carr, A. L. (2017). Using Mechanical Turk for research on cancer survivors. *Psycho-Oncology*, 26(10), 1593-1603. <https://doi.org/10.1002/pon.4173>
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6(1), 3. <https://doi.org/10.1177/1745691610393980>
- Castillo, L., Perez, F., Castillo, R., & Ghosheh, M. (2010). Construction and initial validation of the Marianismo Beliefs Scale. *Counselling Psychology Quarterly*, 23(2), 163-175. <https://doi.org/10.1080/09515071003776036>
- Center for Disease Control and Prevention. (2014, 2017-03-20T12:39:49Z). Cervical Cancer is Preventable | VitalSigns | CDC. *Vital Signs*. <https://www.cdc.gov/vitalsigns/cervical-cancer/index.html>
- Consedine, N. S., Krivoshekova, Y. S., & Harris, C. R. (2007). Bodily embarrassment and judgment concern as separable factors in the measurement of medical embarrassment: Psychometric development and links to treatment-seeking

outcomes. *British Journal of Health Psychology*, 12(3), 439-462.

<https://doi.org/10.1348/135910706X118747>

Cooke, R., & French, D. P. (2008). How well do the theory of reasoned action and theory of planned behaviour predict intentions and attendance at screening programmes?

A meta-analysis. *Psychology & Health*, 23(7), 745-765.

<https://doi.org/10.1080/08870440701544437>

Corcoran, J., & Crowley, M. (2014). Latinas' attitudes about cervical cancer prevention: a meta-synthesis. *Journal of Cultural Diversity*, 21(1), 15-21. <https://doi.org/>

Dewey, J. (2016). Machismo. In *Salem Press Encyclopedia*.

Di Sarra, L., Ghezzi, V., Eastland, T. Y., Antonini, F., Scialò, G., Zega, M., & Alvaro, R.

(2015). Applying the Theory of Planned Behavior to explain women's role in

prostate cancer screening. *Research and theory for nursing practice*, 29(3), 200-

213. <https://doi.org/10.1891/1541-6577.29.3.200>

Dumenci, L., Matsuyama, R., Riddle, D. L., Cartwright, L. A., Perera, R. A., Chung, H.,

& Siminoff, L. A. (2014). Measurement of cancer health literacy and

identification of patients with limited cancer health literacy. *J Health Commun*, 19

Suppl 2(0 2), 205-224. <https://doi.org/10.1080/10810730.2014.943377>

Echeverri, M., Anderson, D., & Nápoles, A. M. (2016). Cancer Health Literacy Test-30-

Spanish (CHLT-30-DKspa), a new Spanish-language version of the Cancer

Health Literacy Test (CHLT-30) for Spanish-speaking Latinos. *J Health*

Commun, 21 *Suppl 1*(Suppl), 69-78.

<https://doi.org/10.1080/10810730.2015.1131777>

- Fernandez, M. E., Diamond, P. M., Rakowski, W., Gonzales, A., Tortolero-Luna, G., Williams, J., & Morales-Campos, D. Y. (2009). Development and validation of a cervical cancer screening self-efficacy scale for low-income Mexican American women. *Cancer Epidemiology Biomarkers And Prevention*, *18*(3), 866-875.
<https://doi.org/10.1158/1055-9965.EPI-07-2950>
- U.S. Preventative Task Force (2018). Cervical Cancer: Screening.
<https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/cervical-cancer-screening>.
- Froment, M. A., Gomez, S. L., Roux, A., DeRouen, M. C., & Kidd, E. A. (2014). Impact of socioeconomic status and ethnic enclave on cervical cancer incidence among Hispanics and Asians in California. *Gynecologic Oncology*, *133*(3), 409-415.
- Garbers, S. C., Chiasson, M. A. (2004). Inadequate functional health literacy in Spanish as a barrier to cervical cancer screening among immigrant Latinas in New York City. *Preventing Chronic Disease*, *1*(4), A07.
- Glasgow, R. E., Whitlock, E., Valanis, B., & Bogt, T. (2000). Barriers to mammography and pap smear screening among women who recently had neither, one, or both types of screening. *Annals of Behavioral Medicine*, *22*, 223-228.
<https://doi.org/10.1007/BF02895117>
- Guntzviller, L. M., King, A. J., Jensen, J. D., & Davis, L. A. (2017). Self-efficacy, health literacy, and nutrition and exercise behaviors in a low-income, Hispanic population. *Journal of Immigrant and Minority Health*, *19*(2), 489-493.
<https://doi.org/10.1007/s10903-016-0384-4>

- Khan, H. M., Gabbidon, K., Saxena, A., Abdool-Ghany, F., Dodge, J. M., Lenzmeier, T. (2016). Disparities in cervical cancer characteristics and survival between white Hispanics and white non-Hispanic women. *Journal Of Women's Health, 25*(10). <https://doi.org/10.1089/jwh.2015.5585>
- Kim, K., Xue, Q. L., Walton-Moss, B., Nolan, M. T., & Han, H. R. (2018). *Decisional balance and self-efficacy mediate the association among provider advice, health literacy and cervical cancer screening*. Paper presented at the European Journal Of Oncology Nursing. <https://doi.org/10.1016/j.ejon.2017.12.001>
- Kim, S., & Hmielowski, J. D. (2017). The influence of self-efficacy in medical drama television programming on behaviors and emotions that promote cervical cancer prevention. *American Journal Of Health Behavior, 41*(6), 719-727. <https://doi.org/10.5993/AJHB.41.6.6>
- Logan, R. A., Press, I., & Siegel, E. R. (2017). *Health Literacy : New Directions in Research, Theory and Practice*. Amsterdam: IOS Press.
- MacLaughlin, K. L., Jacobson, R. M., Radecki Breitkopf, C., Wilson, P. M., Jacobson, D. J., Fan, C., . . . Rutten, L. J. F. (2019). Trends Over Time in Pap and Pap-HPV Cotesting for Cervical Cancer Screening. *J Womens Health (Larchmt), 28*(2), 244-249. <https://doi.org/10.1089/jwh.2018.7380>
- Madhivanan P., V., D., Krupp, K., Ibanez, G. (2016). Family and cultural influences on cervical cancer screening among immigrant Latinas in Miami-Dade County, USA. *Culture, Health & Sexuality, 18*(6), 710-722. <https://doi.org/10.1080/13691058.2015.1116125>

- Moore de Peralta, A., Holaday, B., & McDonnell, J. R. (2015). Factors Affecting Hispanic women's participation in screening for cervical cancer. *Journal of Immigrant and Minority Health, 17*(3), 684-695. <https://doi.org/10.1007/s10903-014-9997-7>
- Mortensen K., H., T. L. (2018). Comparing Amazon's Mechanical Turk platform to conventional data collection methods in the health and medical research literature. *Journal Of General Internal Medicine, 33*(4), 533-538. <https://doi.org/10.1007/s11606-017-4246-0>
- National Center for Immunization and Respiratory Diseases. (2018, 2018-08-22T10:14:47Z). HPV | Who Should Get Vaccine | Human Papillomavirus | CDC. <https://www.cdc.gov/hpv/parents/vaccine.html>
- Nonzee, N. J., Ragas, D. M., Luu, T. H., Phisuthikul, A. M., Tom, L., Dong, X., Simon, M. A. (2015). Delays in cancer care among low-income minorities despite access. *Journal Of Women's Health, 24*(6), 506-514. <https://doi.org/10.1089/jwh.2014.4998>
- Ogilvie, G. S., Smith, L. W., Niekerk, D. v., Khurshed, F., Pedersen, H. N., Taylor, D., Thomson K., Greene, S. B., Babich, S. M., Franco, E. L., Coldman, A. J. (2016). Correlates of women's intentions to be screened for human papillomavirus for cervical cancer screening with an extended interval. *BMC Public Health, 16*(1), 1-8. <https://doi.org/10.1186/s12889-016-2865-8>
- Orbell, S., Hagger, M., Brown, V., & Tidy, J. (2006). Comparing two theories of health behavior: a prospective study of noncompletion of treatment following cervical cancer screening. *Health Psychology, 25*(5), 604-615. <https://doi.org/10.1037/0278-6133.25.5.604>

- Roncancio, A. M., Ward, K. K., & Fernandez, M. E. (2013). Understanding cervical cancer screening intentions among Latinas using an expanded Theory of Planned Behavior Model. *Behavioral Medicine, 39*(3), 66-72.
<https://doi.org/10.1080/08964289.2013.799452>
- Shah, M., Zhu, K., Wu, H., & Potter, J. (2006). Hispanic acculturation and utilization of cervical cancer screening in the US. *Preventive Medicine: An International Journal Devoted to Practice and Theory, 42*(2), 146-149.
<https://doi.org/10.1016/j.ypmed.2005.10.002>
- Shoemaker, M. L., & White, M. C. (2016). Breast and cervical cancer screening among Hispanic subgroups in the USA: estimates from the National Health Interview Survey 2008, 2010, and 2013. *Cancer Causes and Control, 27*(3), 453-457.
<https://doi.org/10.1007/s10552-016-0718-5>
- Siegel, R. L., Miller, K. D., & Jemal, A. (2020). Cancer statistics, 2020. *CA: A Cancer Journal for Clinicians, 70*(1), 7-30. <https://doi.org/10.3322/caac.21590>
- Starfelt Sutton, L. C., & White, K. M. (2016). Predicting sun-protective intentions and behaviours using the theory of planned behaviour: a systematic review and meta-analysis. *Psychology & Health, 31*(11), 1272-1292.
<https://doi.org/10.1080/08870446.2016.1204449>
- Teng, F. F., Mitchell, S. M., Sekikubo, M., Biryabarema, C., Byamugisha, J. K., Steinberg, M., & ... Ogilvie, G. S. (2014). Understanding the role of embarrassment in gynaecological screening: a qualitative study from the ASPIRE cervical cancer screening project in Uganda. *BMJ Open, 4*(4).
<https://doi.org/10.1136/bmjopen-2014-004783>

- Wall K. M., Rocha, G. M. N., Salinas-Martinez, A. M., Baraniuk, S., & Day, R. S. (2010). Modifiable barriers to cervical cancer screening adherence among working women in Mexico. *Journal Of Women's Health, 19*(7), 1263-1270. <https://doi.org/10.1089/jwh.2009.1572>
- Watson, M., Benard, V., & Flagg, E. W. (2018). Assessment of trends in cervical cancer screening rates using healthcare claims data: United States 2003-2014. *Preventative Medicine Reports, 9*, 124-130. <https://doi.org/10.1016/j.pmedr.2018.01.010>
- Yancey, G. B. (2013). Self-efficacy. In *Salem Press Encyclopedia of Health*.
- Zea, M. C., Asner-Self, K. K., Birman, D., & Buki, L. P. (2003). The abbreviated multidimensional acculturation scale: empirical validation with two Latino/Latina samples. *Cultur Divers Ethnic Minor Psychol, 9*(2), 107-126. <https://doi.org/10.1037/1099-9809.9.2.107>
- Zhao, G., Okoro, C. A., Li, J., & Machell, T. (2018). Health insurance status and clinical cancer screenings among U.S. adults. *American Journal of Preventative Medicine, 54*(1), e11-e19. <https://doi.org/10.1016/j.amepre.2017.08.024>

VITA

EMILY TULLOS

EDUCATION

Sam Houston State University 2017-2020
 M.A. in Psychology
 Thesis: *Attitudes, Norms, and Behavioral Control Factors Associated with Intention to Receive Cervical Cancer Screening in Latina Americans.*

Sam Houston State University 2013-2017
 B.A. in Music (psychology minor); final GPA: 3.7, *Magna Cum Laude*

PROFESSIONAL SOCIETY MEMBERSHIPS

APA Division 38/Society for Health Psychology, Student Affiliate 2018
 Association for Psychological Science, Student Affiliate 2018

AWARDS AND ACADEMIC HONORS

SHSU Graduate Student Travel Fund Award Spring 2019
 Graduate Studies General Scholarship Spring 2019
 CHSS Special Graduate Scholarship 2018-2019
 Elliot Bowers Honors Scholarship 2014-2015
 Undergraduate Achievement Academic Scholarship 2014-2015
 University Scholars Scholarship 2013-2014
 President's List (4.0 semester GPA) Fall 2016/Fall 2017
 Dean's List 2013-2017

GRANT FUNDING

NCI R25E Summer Research Experience Competitive Award Summer 2019
 (CA056452, Dr. Shine Chang, PI)
 Cancer Prevention Research Training Program
 The University of Texas at MD Anderson Cancer Center, Houston, TX
Mentor: Lorenzo Cohen, PhD

PUBLICATIONS

1. Ratcliff, C. G., Deavers, F. E, **Tullos, E. A.**, Ricardo, M. R., Christensen, M., Dindo, L., Berger, D., Cully, J. A. (in press). *Brief behavioral intervention for distressed patients undergoing cancer surgery: a case series.* Cognitive and Behavioral Practice.

MANUSCRIPTS UNDER REVIEW

Ratcliff, C. G., Zepeda, S. Hall, M. H., **Tullos, E. A.**, Fowler, S., Chaoul, A., Spelman, A., Arun, B., Cohen, L. *Patient characteristics associated with sleep disturbance during chemotherapy for breast cancer.*

Ratcliff, C. G., Torres, D., **Tullos, E. A.**, Lu, Q. *A narrative review of behavioral interventions for rural breast cancer survivors.*

MANUSCRIPTS IN PREPERATION

Kiser, E., Sinclair, K., **Tullos, E. A.**, Ratcliff, C. G. *Associations between Disordered Eating and Body Focused Repetitive Behaviors in College Students.* (anticipated submission July 2020)

CONFERENCE PRESENTATIONS

1. Torres, D., Willingham, H., **Tullos, E.**, Ratcliff, C. (November 2020). *Examining the Association of Difficulties in Emotion Regulation and Substance & Medication Use with Underlying Personality Pathology and Mindful Eating Traits Among College Students.* Poster to be presented at the 2020 meeting of the Association for Behavioral and Cognitive Therapies, Philadelphia, PA.
2. Nichols, D., **Tullos, E. A.**, Valentine, A., De La Garza, R., Lacourt, T. (September 2020). *Attitudes and opinions toward suicide within the MD Anderson Cancer Center workforce.* Poster to be presented at the 2020 MD Anderson Division of Internal Medicine Research Retreat, Houston, TX.
3. Kiser, E., Sinclair, K., **Tullos, E. A.**, Ratcliff, C. G. (August 2020). *Associations between Disordered Eating and Body Focused Repetitive Behaviors in College Students.* Selected for presentation at the 2020 meeting of the American Psychological Association, Washington, DC.
4. **Tullos, E.**, Ratcliff, C., Goodson, A., Chaoul, A., Hall, M., Cohen, L. (March 2019). *The association between sleep quality and anxiety in women with breast cancer undergoing chemotherapy: the moderating role of coping.* Poster accepted for presentation at the 2019 annual meeting of the American Psychosomatic Society, Vancouver, B.C.
5. Ratcliff, C. G., **Tullos, E. A.**, Deavers, F. E., Ricardo, M. R., Christensen, M., Dindo, L., Cully, J. A. (March 2019). *Development and Pilot Test of a Brief Behavioral Intervention for Distressed Patients Undergoing Surgery for*

Gastrointestinal Cancer. Selected for oral presentation at the 2019 annual meeting of the American Psychosomatic Society, Vancouver, B.C.

6. Fowler, S., Ratcliff, C., **Tullos, E.**, Prinsloo, S., Chaoul, A., Yang, W., Cohen, L. (March 2019). *Spiritual wellbeing as a moderator of brief mindfulness intervention on anxiety during stereotactic breast biopsy*. Selected for oral presentation at the 2019 annual meeting of the American Psychosomatic Society, Vancouver, B.C.
7. **Tullos, E. A.**, Herrera, A., Ratcliff, C. G. (March 2019). *Preliminary results of an investigation of attitudes, social norms, and behavioral control factors influencing cervical cancer screening in Hispanic Americans*. Poster accepted for presentation at the Health Psychology and Behavioral Medicine Conference of the Gulf Coast Consortia, Houston, TX.

PAID RESEARCH EXPERIENCE

MD Anderson Cancer Center, Department of Psychiatry October 2019-Present
Research Interviewer (supervisor: Tamara Lacourt, Ph.D.)

- Coordinate a clinical trial testing short-term use of a mindfulness phone app in newly diagnosed breast cancer patients
- Complete chart reviews and abstract medical conditions, medications, and demographic information of patients
- Design REDCap databases for study data storage
- Assist with design and facilitation of upcoming studies
- Create figures and tables for presentations and publications

MD Anderson Cancer Prevention Research Training Program June 2019-Aug. 2019
Graduate Research Assistant (supervisor: Lorenzo Cohen Ph.D.)

- Formulated an abstract and elevator speech on summer research project
- Redesigned REDCap databases for study data storage
- Trained undergraduate level intern in REDCap and data management tasks
- Assisted with data management and general study-related tasks
- Attended research dissemination and career development programming

Sam Houston State University, Integrative Health Lab May 2018-Aug. 2018
Project Coordinator (supervisor: Chelsea Ratcliff, Ph.D.)

- Recruited, consented, and administered mindfulness-based therapy to participants through a brief 4-session intervention designed to reduce distress resulting from cancer surgery
- Coordinated patient study sessions and proper timing of questionnaires with other study personnel
- Oversaw research assistants providing intervention to cancer patients

- Set up a filing system for all study-relevant data through Baylor College of Medicine servers
- Tracked data for each participant throughout their participation in the study
- Coordinated compensation of study subjects at the baseline, 2-week, and 1-month time points

Sam Houston State University, Political Science Department Jan. 2018-May 2018

Graduate Assistant (supervisor: Heather Evans, Ph.D.)

- Searched for and sorted articles by code words for literature review
- Grouped articles according to overarching themes of interest to researchers
- Summarized key findings from articles and synthesized overall findings into a concise format
- Coded articles from qualitative and quantitative journals covering political science content

VOLUNTEER RESEARCH EXPERIENCE

Sam Houston State University, Integrative Health Lab Sept. 2017-Present

Graduate Research Assistant (supervisor: Chelsea Ratcliff, Ph.D.)

- Contributed to the design of upcoming studies
- Prepared manuscripts and posters for public dissemination
- Assisted in preparing, reviewing, and modifying document forms to be sent to the Institutional Review Board
- Assisted in providing guidance to undergraduate research assistants in their lab work.

University of Houston, Anxiety and Health Research Lab Jan. 2018-May 2019

Research Assistant (supervisors: Lorra Garey, Ph.D.; Michael J. Zvolensky, Ph.D.)

- Coded over 3,000 articles for systematic review
- Assisted in developing ecological momentary assessment (EMA) questionnaires
- Assisted in developing a personalized feedback intervention for smokers concerning pain anxiety
- Created surveys using Qualtrics
- Consented participants interested in completing laboratory studies
- Edited study run-sheets for research assistants conducting study protocol

Data Management Assistant

- Performed data management tasks, including data entry, cleaning, merging, and analyzing
- Tracked missing data from participants in a large randomized control trial
- Attended weekly meetings to discuss team progress and assist in addressing discrepancies in the data

- Gained competency in statistical and database management programs such as SPSS and Access

Front Desk Assistant

- Phone screened participants from the community for multiple research studies
- Oversaw newer members' administrative work
- Assisted in training new research assistants on front-team protocol
- Assisted in updating training materials for the functionality of the laboratory and clinic

TEACHING EXPERIENCE

Role: Teaching Assistant

Course Title: Abnormal Psychology (PSYC 3331)

Institution: Sam Houston State University, Department of Psychology

Enrollment: 150 Undergraduate students

Role: Instructor

Course Title: Qualtrics Workshop, Fall 2018

Institution: Sam Houston State University, Department of Psychology

Enrollment: 15 Undergraduate/Graduate Students

EDITORIAL RESPONSIBILITIES

- *Journal of Psychosocial Oncology* (Mentored Review)
- *Mindfulness* (Mentored Review)
- *Association for Psychological Science RISE Research Award* (Student Reviewer)

SERVICE ACTIVITIES

Society for Health Psychology Campus Representative 2019-2020

TRAINING/CERTIFICATIONS

- Salivary Cortisol Collection
- Biopac Data Acquisition System Training (ECG and RSP)
- MINI (Mini International Neuropsychiatric Interview 6.0 and 7.0.2) Training
- Writing and Publishing Scientific Articles
Workshop completed at MD Anderson Cancer Center, Houston, TX
- Clinical Research Training for Study Coordinators
Workshop completed at MD Anderson Cancer Center, Houston, TX
- Human Subjects Protection Training
Online course series completed at MD Anderson Cancer Center, Houston, TX

RELEVANT SKILLS AND PROFICIENCIES

Qualtrics
SPSS (Statistical Package for the Social Sciences)
Biopac (ECG and RSP)
ICON (Integrated Compliance Oversight Network)
Cayuse IRB
Endnote
EPIC EMR system
REDCap
OpenSesame (Experimental Stimuli Creation Software)
Clinical Oncology Research System (CORG)

REFERENCES

Available Upon Request