2020-01-01

Testing A Culturally Tailored Intervention To Promote HPV Vaccination Intentions In Latina Young Adults

Erica Landrau
University of Texas at El Paso

TESTING A CULTURALLY TAILORED INTERVENTION TO PROMOTE HPV VACCINATION INTENTIONS IN LATINA YOUNG ADULTS

ERICA LANDRAU-CRIBBS

Doctoral Program in Psychology

APPROVED:

Lawrence D. Cohn, Ph.D., Chair

Julia Lechuga, Ph.D.

Osvaldo Morera, Ph.D.

Craig Field, Ph.D.

Ana Schwartz, Ph.D.

Stephen L. Crites Jr., Ph.D.
Dean of the Graduate School

TESTING A CULTURALLY TAILORED INTERVENTION TO PROMOTE HPV VACCINATION INTENTIONS IN LATINA YOUNG ADULTS

By

ERICA LANDRAU-CRIBBS, M.A.

DISSERTATION

Presented to the Faculty of the Graduate School of

The University of Texas at El Paso

in Partial Fulfillment

of the Requirements

for the Degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

THE UNIVERSITY OF TEXAS AT EL PASO

May 2020

Abstract

The human papillomavirus (HPV) is the most common sexually transmitted infection in the United States and a known risk factor for cervical cancer. Several HPV vaccines have been approved as a primary prevention option. Vaccination rates remain low among Latinas, despite a disproportionately high rate of cervical cancer rates of among this population. Few culturally tailored interventions to promote HPV vaccination have been developed for Latina young adults. The first objective of the present study was to test the efficacy of a culturally-tailored fotonovela to increase intention to vaccinate among Mexican American female young adults. The second objective was to test the differential efficacy of a culturally-tailored fotonovela among Mexican American female young adults and a comparison group of non-Latina Whites female young adults. The third objective of this study was to test *identification* and *transportation* as potential mediators. Results showed that Mexican American participants who read the fotonovela showed significantly greater gains in HPV knowledge and a stronger intention to perform modelled behaviors in comparison to non-Latina Whites who read the fotonovela. Additionally, Mexican American participants who read the fotonovela showed significantly greater gains in HPV knowledge, HPV vaccine knowledge, and a stronger intention to perform modelled behaviors in comparison to those who read a CDC fact sheet. Findings from this study provide partial evidence for fotonovelas as an effective HPV vaccine intervention for Latina young adults.

Keywords: HPV, HPV vaccine, fotonovela, Latinas

Table of Contents

List of Tables

List of Figures

Introduction

HPV is the most common sexually transmitted infection in the United States. Estimates of the prevalence of HPV indicate that approximately 79 million US Americans are infected with HPV and nearly 14 million US Americans become infected each year (Centers for Disease Control and Prevention [CDC], 2014). HPV is transmitted from an infected individual through skin-to-skin contact during vaginal, anal and/or oral sex (American Cancer Society, 2018). Although more than 100 strains of HPV have been identified, certain strains have been classified as high or low-risk (types 16 and 18) and are the primary cause of cervical, throat, vulvar, vaginal, anal and penile cancers (CDC, 2012; Cancer, 2018). HPV strains belonging to the low-risk category are types 6 and 11, and have been associated with the incidence of genital warts and recurrent respiratory papillomatosis.

The Food and Drug Administration has approved three vaccines that protect against HPV: Gardasil®, Gardasil® 9, and Cervarix®. Clinical trials have shown that Gardasil® and Cervarix® provide almost 100% protection against HPV infection for up to 8-9 years. Gardasil 9® has been found to be 97% effective in preventing cervical cancer and vulvar cancer (National Cancer Institute [NCI], 2015) and is the only HPV vaccine available for administration in the United States. In order to prevent HPV-related infection, vaccination has been identified as the primary option (CDC, 2007) followed by screening tests (i.e., Pap test and/or HPV test to identify abnormal cells or DNA from HPV within the cervix) and treatment as secondary prevention options (Office of Women's Health, 2019; Sherris, Friedman, Wittet, Davies, Steben, & Saraiya, 2006).

The HPV vaccine is recommended for individuals 11 to 12 years old, and vaccination can be administered to children as young as nine years old. Healthcare providers recommend that the HPV vaccine shot series is completed by 13 years of age (American Cancer Society, 2018a) since the efficacy of the vaccine at preventing cancer decreases as the age of initiation increases (American Cancer Society, 2018b). The number of recommended doses varies based on the age in which the individual initiates vaccination. Individuals initiating the vaccine before 15 years of age would need to complete two doses of the HPV vaccine with 6-12 months between the first and second dose in order to be fully protected. Individuals 15 to 26 years old would need to complete three doses of the HPV vaccine within six months. The second dose should be administered 1-2 months after the first dose, with the third dose being administered six months after the first dose. If the dosing schedule is interrupted, the HPV vaccine shot series does not need to be restarted (Meites, Kempe, & Markowitz, 2016). Although vaccination is recommended before an individual becomes sexually active to maximize immunological protection, initiation of the HPV vaccination series is still recommended if an individual is currently sexually active, has been or is currently infected with HPV, or has an abnormal Pap smear test (Jones & Cook, 2008).

Despite recommendation to vaccinate, HPV vaccination initiation and completion rates are low among young adults between the ages of 18 to 26, which is worrisome since the highest HPV prevalence rates occur in sexually active individuals between the ages of 20 to 25 years (Schiffman & Kjaer, 2003). Approximately 39.9% of males and females between the ages of 18 to 26 have received at least one dose of the HPV vaccine, 21.5% of males and females between the ages of 18-26 have received the recommended number of HPV vaccine doses and 35.3% of females between the ages of 18-26 have received the recommended number of doses of the HPV

vaccine (Boersma & Black, 2018). Also, HPV vaccination initiation rate disparities exist when comparing Latinas and non-Latina Whites between the ages of 18 and 26 (Boersma & Black, 2018). An estimated 48.8% of Latina young adults have received at least one shot of the HPV vaccine in comparison to 57.9% of Non-Latina Whites (Boersma & Black, 2018). Additionally, an estimated 9.6% of Latina young adults have completed the HPV three shot-series in comparison to 14.9% of Caucasians (Laz, Rahman, & Berenson, 2013). It should be noted that the latter estimations of HPV vaccine completion rates are based off of the previous HPV vaccination recommendations (i.e., HPV vaccination completion requires three shots of the HPV vaccine). Since the HPV vaccination recommendations have changed, updated estimations of HPV vaccination completion rates for young adults 18-26 years old by ethnicity have not been reported. Futhermore, Latina women are diagnosed with cervical cancer at higher rates than non-Latina Whites (Hernandez et al., 2008; Howlander et al., 2014). Latina women have a cervical cancer rate of 9.4/100,000 compared to the incidence rate of non-Latina Whites women which is estimated at 7.5/100,000 (US Cancer Statistics, 2018). However, HPV-related vulvar cancer rates for Latinas (1.2/100,000) and non-Latina Whites (2.2/100,000), and HPV-related vaginal cancer rates for Latinas (0.4/100,000) and non-Latina Whites (0.4/100,000) remain similar (CDC, 2018).

Even though there is a need for interventions to promote HPV vaccine uptake among Latina young adults (Cohen & Legg, 2014; Lechuga, Vera-Cala, & Martinez-Donate, 2014; Maertens, Jiminez-Zambrano, Albright, & Dempsey, 2017), few health education interventions and communications have been developed to target this at-risk population (Chan, Brown, Sepulveda, & Teran-Clayton, 2015; Molokwo, Fernandez, & Martin, 2014). This further compounds the problem since Latinas are less likely to receive a recommendation from a

healthcare provider to vaccinate against HPV in comparison to non-Latina Whites (Jeudin, Liveright, Del Carmen, & Perkins, 2014; Laz & Berenson, 2015; Ytilao, Lee, & Mehta, 2013), which is especially concerning since a recommendation to vaccinate has been shown to increase the odds of vaccine receipt (Ytilao, Lee, & Mehta, 2013). Latinas are also less likely to have heard about HPV from a healthcare provider (Lau, Lin, & Flores, 2012; Polonijo & Carpriano, 2013; Reimer, Schommer, Houlihan, & Gerrard, 2014). Lastly, in a previous study Latinas who live along the Texas-Mexico border displayed lower knowledge of HPV than Latinas participating in a national study (Kobetz et al., 2010; Molokwo, Fernandez, & Martin, 2014). These findings highlight the importance of developing culturally appropriate interventions to inform Latinas about HPV and the role of the HPV vaccine in cancer prevention.

Latina young adults have reported that their family members are a preferred source of information in their decision on whether or not to receive the HPV vaccine (Stephens & Thomas, 2014). Even in cases when Latinas were informed about the HPV vaccine from another source, they still went to their mothers for guidance (Stephens & Thomas, 2014) or to help decide whether or not to get vaccinated against HPV (Hopfer, Garcia, Duong, Russo, & Tanjasiri, 2017). Additionally, Latinas who knew more friends and family members who had received the HPV vaccine had four times greater odds of vaccinating against HPV than non-Latina Whites (Reimer, Houlihan, Gerrard, Deer, & Lund, 2013). These findings highlight the importance of Latinas' social network, especially mothers, in making the decision to vaccinate. Latina adolescents and young adults report a greater need for guidance from their mothers on sexual and reproductive health including how to prevent STIs (Guilamo-Ramos et al., 2019) but report fears of punishment (Guilamo-Ramos, Dittus, Jaccard, Goldberg, Casillas, & Bouris, 2006), embarrassment (Colon-Lopez et al., 2017; Guilamo-Ramos, Dittus, Jaccard, Goldberg, Casillas,

& Bouris, 2006), less comfort in past discussions with their mothers and less confidence in current family communication regarding sexual health and HPV in comparison to non-Latina Whites (Romo, Cruz, & Neilands, 2011).

Although Latina mothers believe it is their responsibility to have discussions about sexual health with their daughters (Guilamo-Ramos, Bowman, Benzekri, Ruiz, & Beltran, 2019; Morales-Campos, Markham, Peskin, & Fernandez, 2013; Moran, Murphy, Chaterjee, & Amezola-Herrera, & Baezconde-Garbanati, 2014), the content of discussions typically emphasize their beliefs and values, such as delaying sex and abstinence until marriage, rather than emphasizing facts about sex and protective strategies in order to prevent pregnancy and sexually transmitted infections (Guilamo-Ramos et al., 2019; Guilamo-Ramos, 2006; Raffaeli & Green, 2003; Romo, Bravo, Cruz, Rios, & Kouyoumdjian, 2010). Although both Latinas and non-Latina Whites experience value-specific communication from their mothers, one study (Reimer, Houlihan, Gerrard, Deer, & Lund, 2013) found that greater value-specific communication was associated with lower odds of HPV vaccination uptake for Latinas and greater odds of HPV vaccination uptake for non-Latina Whites. Latina mothers acknowledge that their lack of communication about sex puts their daughter(s) at an even greater risk for contracting HPV and developing cervical cancer (Morales-Campos, Markham, Peskin, & Fernandez, 2013) but report feelings of embarrassment when discussing sex.

Latina mothers also mention family members including mothers, partners and even extended family as barriers to vaccinating their daughters. Latina mothers believe their family members would not support vaccinating their daughters. The lack of support from family members is due to the fear that HPV vaccination would make their daughter(s) more likely to engage in sex cancer (Morales-Campos, Markham, Peskin, & Fernandez, 2013). Even though

mothers believe that they are responsible for protecting their daughters health, they also request guidance from family-centered printed materials in order to guide conversations with their daughters about the HPV vaccine and manage the resistance from their immediate and extended family members (Moran, Murphy, Chatterjee, Amezola-Herrera, & Baezconde-Garbanati, 2014). Narrative health communication interventions can be an effective source of information that simultaneously addresses the multiple factors that influence a Latina young adult's decision to vaccinate against HPV.

Promoting Health through Entertainment Education

Narratives are stories that include a chronological sequence of events in which a character or set of characters experience conflict but eventually come to a final resolution (Hinyard & Kreuter, 2007; Shen, Sheer, & Li, 2015). Health communication interventions have used narratives to promote preventative health behaviors (e.g., HPV vaccine), detection behaviors (e.g., breast cancer screening) and cessation behaviors (e.g., drinking alcohol) through print (e.g., fotonovela), audio (e.g., radionovela), and video (e.g., webnovela or television shows) using an entertainment-education format. Entertainment-education inserts an educational message within an entertaining narrative in an effort to inform audiences, shift their attitudes and promote behavior change (Singhal & Rogers, 2012; Singhal & Rogers, 2002). A recent meta-analysis calculated effect sizes across 22 studies (n = 19,517) of health-related entertainment-education interventions shared through television and radio. Results showed significant small effects in the intended direction for knowledge (r = .15, k = 13), attitudes (r = .08, k = 6), behavioral intentions (r = .10, k = 12), and health behaviors (r = .08, k =10; Shen & Han, 2014). When looking at different health behaviors, results showed significant small effects for health detection behaviors (r = .10, k = 4), health prevention behaviors (r = .13, k = 15) and organ

donations (r = .10, k = 3; Shen & Han, 2014). By inserting educational messages promoting preventative health behaviors such as HPV vaccination into entertaining narratives, the intent to persuade becomes less pronounced which in turn helps to reduce resistance from audiences who may have attitudes or beliefs that may counter the message being shared (Kreuter et al., 2007; Moyer-Gusé, 2008). It is important to note that the efficacy of entertainment education has been shown to be affected by research design (lab experiments versus field studies) and message exposure time (a single episode versus multiple episodes; Shen & Han, 2014). Results showed significant small effects for field studies (r = .13, k = 19) whereas lab experiments showed non-significant effects (r = .03, k = 3). Although lab experiments showed non-significant effects, additional research has shown that increasing text length of print narratives (beyond 400 words) has been shown to increase the effectiveness of print narratives (Shen, Sheer, & Li, 2015). Additionally, results showed significant small effects for multiple episodes (r = .13, k = 17) whereas a single episode showed non-significant effects (r = .07, k = 5; Shen & Han, 2014).

Fotonovelas

A fotonovela is a form of entertainment-education that has been traditionally used in Latin America as an accessible medium for entertainment (Flora & Flora, 1978). Originally, fotonovelas were developed to share the dramatic narrative of motion picture films through the use of still photographs and cartoon-like bubbles displaying the dialogue between characters. Now, fotonovelas are used as a health education tool for public health interventions targeting low health literacy audiences (Valle, Yamada, & Matiella, 2006) and Latino communities (Hidalgo, 2014). Fotonovelas have been developed to address health issues such as diabetes (Unger, Molina, & Baron, 2009), depression (Hernandez & Organista, 2013; Unger, Cabassa, Molina, Contreras, & Baron, 2013), and the HPV vaccine (Chan, Brown, Sepulveda, & Teran-Clayton,

2015). For example, the fotonovela entitled *Sweet Temptations* was developed to provide diabetes education to Latino adults and the efficacy of the fotonovela was tested with Latino adults 18 years and older. Note, there was no control group, so changes in participants' scores were assessed for difference from pre- to post-test. Findings indicated significant increases from pre-test to post-test in diabetes knowledge (d = 1.44), intention to exercise (d = .59), intention to eat fruits and vegetables (d = .39), intention to talk to a doctor (d = .70), and intention to talk to a family member about how to prevent diabetes (d = .46) for Latinos who read the fotonovela (Unger, Molina, & Baron, 2009). Similarly, the fotonovela entitled *Secret Feelings* provided education on depression for Latina immigrant adults. Latinas who read the *Secret Feelings* fotonovela showed significant gains in knowledge of depression (d = 1.19), self-efficacy to identify the need for treatment of depression (d = 1.20), and intention to seek treatment for depression (d = .47) in comparison to Latinas who took part in an educational discussion about family communication. Although there is no standardized method for developing a fotonovela (Hidalgo, 2014), narratives can be informed through formative research, described below.

Fotonovela: Narrative Development

Formative research uses qualitative and quantitative methods in order to develop interventions that are relevant to the target group (Gittelson et al., 2008; Vastine, Gittelsohn, Ethelbah, Anliker, & Caballero, 2005). For example, the fotonovela for the current study, entitled *How did this even Happen?* follows Sofia's journey towards her decision to receive the HPV vaccine. The narrative was informed by formative research conducted with the target audience of Mexican American female young adults who had not completed the HPV vaccine series. Specifically, interviews were conducted with 20 female students recruited from the University of Texas at El Paso who were 18-26 years old, self-identified as Mexican-American,

and had not completed the HPV vaccine series (Landrau-Cribbs, 2018). Interview questions were informed by the Combined PEN-3 model of health behavior in order to culturally tailor the fotonovela to the three domains included in the Combined PEN-3 model (Scarinci, Bandura, Hidalgo, & Cherrington, 2012). The Combined PEN-3 model of health behavior includes three health-relevant domains: 1) health education, 2) educational diagnosis of health behavior, and 3) cultural appropriateness of health behavior. The first domain, health education, refers to three potential targets of intervention (Target Person, Target Peron's Extended Family, and Target Person's Neighborhood). This domain helps to identify the individuals who will be the target of the behavior change intervention, the extended family that may influence the potential behavior change, and neighborhoods in which the intervention is necessary. The second domain, educational diagnosis of health behavior, refers to three factors that facilitate or inhibit enactment of a health behavior: Perception, Enablers, and Nurturers. Perceptions of the health behavior include personal knowledge, attitudes or beliefs that facilitate or inhibit enactment of a health behavior; Enablers refer to the cultural and structural factors that influence engagement in the health behavior; and Nurturers refer to the influence of members of the individual's social network in making a health-related change. Lastly, the category cultural appropriateness of health behavior refers to the specific type of influence that Perception, Enablers, and Nurturers may have on an individual's beliefs and practices and this influence may be positive (encouraging HPV vaccination), exotic (neither positively nor negatively influencing HPV vaccination), and/or negative (discouraging HPV vaccination). In addition, participants were asked to evaluate a previously developed and tested fotonovela promoting the HPV vaccine among young adults (Chan, Brown, Sepulveda, & Teran-Clayton, 2015). After the interviews

were completed, a content analysis was conducted using the data from the twenty interviews and the following paragraph highlights the themes that emerged (Landrau-Cribbs, 2018).

Fourteen PEN themes emerged from the content analysis of the interviews with the target audience of Mexican American female young adults who had not completed the HPV vaccine shot series. Each of the 14 themes were assigned to one of the PEN-3 categories: perceptions (e.g., positive attitudes toward vaccines), enablers (e.g., open communication with family about sexuality) or nurturers (e.g., positive influence of mother) within the Educational Diagnosis of Health Behavior domain. After determining whether the theme representing a perception, enabler or nurturer, the themes were then categorized as either a positive or negative influence on HPV vaccination under the Cultural Appropriateness of Health Behavior domain within the PEN-3 model. Positive themes encouraged vaccination (e.g., vaccines as prevention) and negative themes discouraged vaccination (e.g., vaccination as condoning sex). Themes that encouraged HPV vaccination (e.g., vaccine effectiveness) were emphasized in the fotonovela. Themes that discouraged HPV vaccination were *reframed* in the fotonovela to highlight the benefits of HPV vaccination (e.g., preventing cancer rather than condoning early sexual activity (Landrau-Cribbs, 2018).

The principal characters of the fotonovela *How did this even Happen?* used in the current study are Sofia and her mother, Sofia's friends Carla and Ana, and the pharmacist administering the HPV vaccine. The gist of the storyline is that Sofia learns that her friend, Carla, has just received a positive HPV diagnosis. Carla conveys to Sofia and their mutual friend, Ana, the severity of her HPV diagnosis and her concerns regarding treatment. In hopes of preventing the same fate, Sofia goes home to ask her mother about her HPV vaccine status. When Sofia asks her mother about her vaccination status, Sofia's mother responds by asking Sofia if she wants the

vaccine because she had initiated sexual activity. Sofia tells her mother that she wants to prevent cancer. Sofia's mother calls her sister who tells her that she vaccinated her daughter and son because she could not bear the thought that her daughter and son were not protected from cancer. Sofia's mom talks to her daughter and tells her that health is the most important thing to her and that she would like to accompany Sofia to the pharmacy to obtain the vaccine. The fotonovela displays Sofia's mom and the Pharmacist supporting Sofia's decision to vaccinate. While receiving the vaccine, the pharmacist reminds Sofia to return for her final shot of the vaccine and informs her of the importance of a pap smear as a method of screening for HPV (Landrau-Cribbs, 2018).

A similar fotonovela promoting HPV vaccination has been tested with their target audience of 18-26 year old male and female young adults in order to assess the effectiveness of the intervention at increasing knowledge, changing attitudes and beliefs, and increasing intentions to vaccinate. Specifically, the fotonovela entitled *What You Don't Know* displays the story of a Latina young adult who learned of the importance of the HPV vaccine when she begins to suspect that her partner is cheating (Chan, Brown, Sepulveda, & Teran-Clayton, 2015). All participants read the *What You Don't Know* fotonovela and completed measures pre- and post-intervention. No control group was included, so changes from pre- to post- reading the fotonovela were assessed. Results showed that 10.5% of the Hispanics sample was more likely to perceive themselves as susceptible to contracting HPV after reading the fotonovela. Also, 13.0% of Hispanics were more likely to report positive attitudes toward the HPV vaccine after reading the fotonovela (Chan et al., 2015). However, the absence of a control group in the above study limits the conclusions that can be drawn about the fotonovela's efficacy, an experimental design limitation that is addressed in the current dissertation research.

Additionally, fotonovela interventions promoting HPV vaccination have been tested against non-narrative interventions among Mexican American female young adults. For example, Landrau-Cribbs (2018) randomly assigned Latina young adults to one of two intervention conditions: 1) participants read a fotonovela depicting the benefits of the HPV vaccine, or 2) participants read a CDC fact sheet depicting the benefits of HPV vaccination. The fotonovela, entitled *How did this even Happen?* (referred to earlier), follows the story of Sofia as she attempts to get the HPV vaccine after learning about HPV and the HPV vaccine from her friend Carla. The latter study (Landrau-Cribbs, 2018) built on the previously mentioned research design (Chan et al., 2015) by including a comparison group, comparing the *How did this even Happen?* fotonovela (intervention) to the non-narrative CDC fact sheet (control condition). Mexican American female young adults who read that fotonovela reported significantly greater gains in behavioral intentions to vaccinate against HPV compared to Mexican American female young adults who read the HPV fact sheet developed by the CDC (d = 0.45). Additionally, the perceived severity of contracting HPV was significantly greater among female participants who read the fotonovela compared to female participants who read the HPV fact sheet developed by the CDC (η^2 = .05). However, participants who read the HPV fact sheet developed by the CDC displayed greater gains in HPV knowledge compared to participants who read the fotonovela (η^2 = -.09; Landrau-Cribbs, 2018). Although two fotonovelas using a narrative approach have been shown to be effective at promoting the HPV vaccine among Latina young adults, neither narrative intervention identified the underlying mechanisms that explain their effectiveness.

Model of Culture-Centric Narrative in Health Promotion

The effectiveness of health-related narrative communications such as *How did this even Happen?* may be explained by using the Model of Culture-Centric Narrative in Health

Promotion (Larkey & Hecht, 2010; see Figure 1 for the model). The following processes within the model have been used to explain the effect of narratives on health-related outcomes: transportation, identification and social proliferation. If narrative recipients are able to see themselves reflected in the characters and narrative, then the narrative recipients are likely to become absorbed in the narrative (transportation) and identify with characters (identification) which will eventually lead to sharing and discussing the narrative with others (social proliferation). In addition, behavior change is possible through social proliferation in which recipients share the narrative with others, others reinforce its message, provide support for others and receive support from others to initiate the recommended health behavior (Larkey & Hecht, 2010). These proposed effects of transportation and identification in the relationship between narrative characteristics and narrative outcomes can be tested using the Model of Culture-Centric Narrative in Health Promotion (Larkey & Hecht, 2010; see Figure 1 for the model). Narrative characteristics include engaging characters and storylines embedded within what the recipient perceives as their culture. It should be noted that the degree to which the message recipient identifies with the culture reflected within the narrative determines the importance of the cultural cues within the narrative (Larkey & Hecht, 2010).

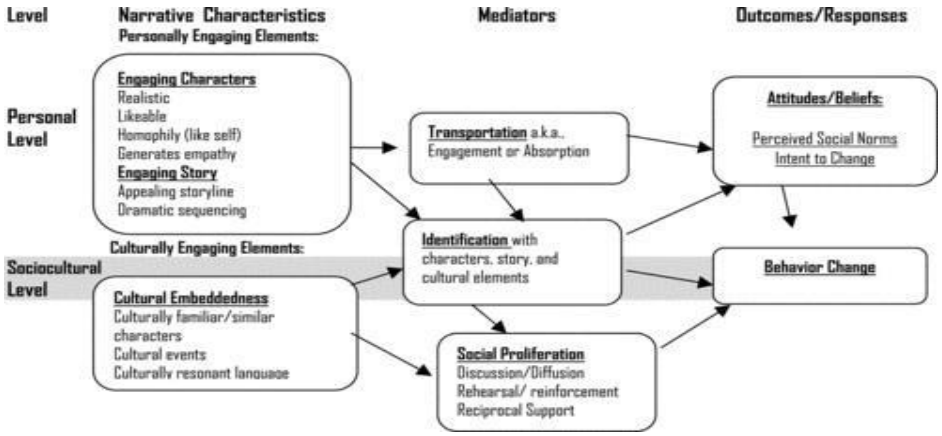

Figure 1. A Model of Culture-Centric Narratives in Health Promotion (Larkey & Hecht, 2010)

Identification

Identification with narrative characters helps to explain the impact of narratives on health-related outcomes. Identification refers to the degree to which the reader loses their own perspective or sense of self and adopts the perspective of the character, internalizes the goals and motives of the character within the narrative and shares the feelings of the character (Cohen, 2001; Green & Jenkins, 2014). When readers lose their sense of self and adopt the perspective of the character, they begin to experience the events in the narrative as if they, themselves, were the target character. Similarly, readers who identify with the narrative characters attent to the dialogues as if the dialogues were directed toward them (Cohen, 2001; Cohen, 2006). Identification has been equated to a semi-permeable membrane (Oatley, 1994) in which narrative recipients can move from their own perspective to identifying with one or more characters during the narrative (Cohen, 2006). It should be noted that there is no consensus on how identification should be conceptualized and measured (Moyer-Gusé, 2008). However, identification with characters in the narrative has been shown to significantly influence self-efficacy (Borrayo, Rosales, & Gonzalez, 2017; Moyer-Gusé , Chung, & Jain, 2011), attitudes (de Graaf, Hoken, Sanders, & Beentjes, 2011; Igartua & Barrios, 2012; Moyer-Gusé , Chung, & Jain, 2011), behavioral intentions (Moyer-Gusé, Chung, & Jain, 2011), perceived norms (Borrayo, Rosales, & Gonzalez, 2017), and reduce counter arguments (McQueen, Kreuter, Kalesan, & Alcaraz, 2011; Moyer-Gusé , Chung, & Jain, 2011).

For example, female viewers were asked to watch an episode of the *Sex and the City* in which the main characters (Samantha and Miranda) navigate getting tested for a sexually transmitted infection. In the storyline, Samantha's partner requests that she gets tested for HIV before they have sex. She eventually gets tested and later learns that she is HIV-free. After

getting tested for STIs, Miranda finds out that she has contracted chlamydia. After she finds out that she has contracted chlamydia, she goes through the process of contacting her previous sexual partners to inform them to get tested while she receives treatment. Results showed that greater identification with Samantha and Miranda was significantly associated with greater self-efficacy to perform the same behaviors modelled within the narrative (r = .23). That is, higher levels of identification were associated with increased self-efficacy for discussing STIs with partners, friends, or healthcare providers. Similarly, higher levels of identification were associated with increased self-efficacy for getting tested. Likewise, higher levels of identification were associated with increased self-efficacy for asking a partner to get tested. Finally, higher levels of identification were associated with a reduction in the number of arguments countering the information presented in the narrative (r = - .42; Moyer-Gusé, Chung, & Jain, 2011). In a separate study, young adult viewers were asked to watch an episode of the *OC* in which Ryan and Theresa experience the difficult consequences of an unplanned pregnancy. Results showed that greater identification was associated with increased perceived vulnerability of having an unplanned pregnancy (r = .26), and in turn, increased intentions to use safe sex practices at the end of the episode as well as two weeks after viewing the episode (r = .27; Moyer-Gusé & Nabi, 2010).

Perceived similarity between the character and reader is hypothesized to precede the process of identification (Cohen, 2001; Cohen, 2006; de Graaf, 2014; Larkey & Hecht, 2010; Slater & Rouner, 2002). It is believed that in order for the recipient of the narrative to identify with a character within a narrative, the message recipient has to perceive some degree of similarity between the character and him/herself (Cohen, 2001; Hoeken, Kolthoff, & Sanders, 2016). Character-reader similarity can be facilitated by subjective and objective characteristics

within the narrative. Subjective characteristics include values, attitudes, personality, or beliefs that the recipient either perceives as similar to the character(s) within the narrative or can become similar to character(s) as a consequence of reading the narrative. Objective characteristics include physical appearance or demographics such as ethnicity, age or socioeconomic status that the recipient perceives as similar to the character(s) while reading but cannot change as a consequence of reading the narrative (de Graaf, 2014; de Graaf, Hoeken, Sanders & Beentjes, 2012; Larkey, Hecht, 2010; Murphy, Frank, Chatterjee, & Baezconde-Garbanti, 2013).

Instead of manipulating characteristics of the narrative characters to test the similarity-identification hypothesis, some studies have manipulated the type of participant viewing the narrative. For example, the narrative film *The Tamale Lesson* follows the story of Lupita who has just been diagnosed with HPV after receiving an abnormal Pap smear test result. Lupita discusses her diagnosis with her sister (Connie), mother (Blanca), and friend (Petra), while also sharing facts about cervical cancer, explaining the purpose of a Pap smear test, and modeling the process of receiving a pap smear test in order to screen for cervical cancer. At the end of the narrative film, all three characters (Connie, Petra, and Blanca) go to a local clinic for a pap smear test (Murphy, Frank, Chatterjee, & Baezconde-Garbanati, 2013). Results showed that Mexican Americans identified more with Lupita (d = .76), Connie (d =.52) and Petra (d =.31) than European Americans which may be explained by greater character-reader similarities in objective characteristics (e.g., ethnicity) and subjective characteristics (e.g., family dynamics). It should be noted that African Americans respondents also indicated a strong identification with the Latina characters due to the characters being "*relatable even though it was from the perspective of a Latina woman…*" and being similar to "*my family culture too.*." European

Americans also mentioned that they could identify with a "*warm family*" but could not relate to "*all the buildup [behind Petra's first Pap test to screen for Cervical Cancer]*" (Murphy, Frank, Chatterjee, & Baezconde-Garbanati, 2013).

Transportation

In addition to identification, transportation has been identified as an underlying mechanism that can explain narrative outcomes. Transportation is the experience of being immersed in a narrative or transported into the narrative world. When message recipients are transported into the narrative, recipients become attentive to the events within the narrative, and experience emotional and cognitive responses that are consistent with the story events as they unfold while losing sense of their own reality (Green & Brock, 2000). As a consequence of becoming transported into the narrative, individuals are less able to access information that may conflict with the narrative, making the message more persuasive with individuals reporting greater story-consistent beliefs and attitudes (Green & Brock, 2000; Moyer-Gusé, 2008; Slater & Rouner, 2002).

In the case of health-related narrative communications, previous research has found that narrative transportation has significantly impacted health-related outcomes. For example, regular female viewers of the show *Desperate Housewives* were contacted before and after watching the six-episode Hodgkin's Lymphoma storyline (Murphy, Frank, Moran, & Patnoe-Woodley, 2011). During the six-episode storyline, Lynette Scavo is diagnosed with Non-Hodgkin's Lymphoma, begins chemotherapy treatment, and experiences a sequence of highs and lows until she is eventually in recovery and cancer free. Results showed that transportation into the narrative significantly increased knowledge of Hodgkin's Lymphoma, cancer, and symptoms of chemotherapy; improved attitudes toward a cancer diagnosis; increased talking about Hodgkin's

Lymphoma and cancer; and increased intentions to seek information about cancer (Murphy, Frank, Moran, & Patnoe-Woodley, 2011).

Relationship between Transportation and Identification

There is some confusion over the conceptual relationship between transportation and identification (Cohen, 2006; De Graaf, 2014; Hopfer, 2009). Both concepts are conceptually similar in that narrative recipients lose awareness and are absorbed in either the narrative (reflecting "transportation") or a character within the narrative (reflecting "identification"; Moyer-Guse, 2008; Tal-Or & Cohen, 2010). When a message recipient identifies with a character, they begin to experience the narrative from the character's perspective (Tal-Or & Cohen, 2010). There has also been confusion over the order of transportation and identification with researchers positing the possibility of identification preceding transportation (Cohen, 2001), identification as a consequence of transportation (Slater & Rouner, 2002), or transportation and identification occurring together in an effort to experience narrative engagement (Busselle & Bilandzic, 2008). For example, if identification precedes transportation, narrative recipients would take the perspective of one or more characters, and would become absorbed in the plot because they care about what happens to the character(s). In the case that identification is a consequence of transportation, narrative recipients would become so absorbed in the narrative events that they are more likely to empathize with the character(s).

Present Study

The purpose of the current study is to test the efficacy of a culturally-tailored fotonovela that was designed to increase HPV vaccine-related knowledge and increase HPV-related knowledge. In addition, the study sought to test the efficacy of the culturally tailored fotonovela for increasing perceived self-efficacy to model health-related behaviors depicted in the

fotonovela, and increasing behavioral intentions to model health-related behaviors depicted in the fotonovela. Additionally, the study investigated if the culturally-tailored fotonovela was more effective at increasing HPV-related knowledge and behaviors in Mexican American females compared to non-Latina White females. Finally, we sought to determine if two variables, "identification" and "transportation", serve as mediators of the hypothesized relationship depicted in Figure 2. To investigate the above issues, Mexican American participants were randomly assigned to receive either the CDC fact sheet or fotonovela. Non-Latina White participants were assigned to only receive the fotonovela. Assessment of outcome measures were taken at three-time points (pre-test, immediate post-test, and at one week follow-up one week after the immediate post-test).

It was predicted that Mexican American female young adults who read the fotonovela would have significantly greater gains in: (a) HPV knowledge, (b) HPV vaccine knowledge, (c) perceived self-efficacy to perform modelled behaviors, and (d) intention to perform modelled behaviors than Mexican American female young adults who read the CDC fact sheet. Additionally, it was predicted that Mexican American female young adults who read the fotonovela would have significantly greater gains in: (a) HPV knowledge, (b) HPV vaccine knowledge, (c) self-efficacy to perform modelled behaviors, and (d) intention to perform modelled behaviors than non-Latina White female young adults who read the fotonovela. In addition to testing the efficacy of the culturally-tailored fotonovela, identification and transportation were tested as potential mediators (see Figure 2).

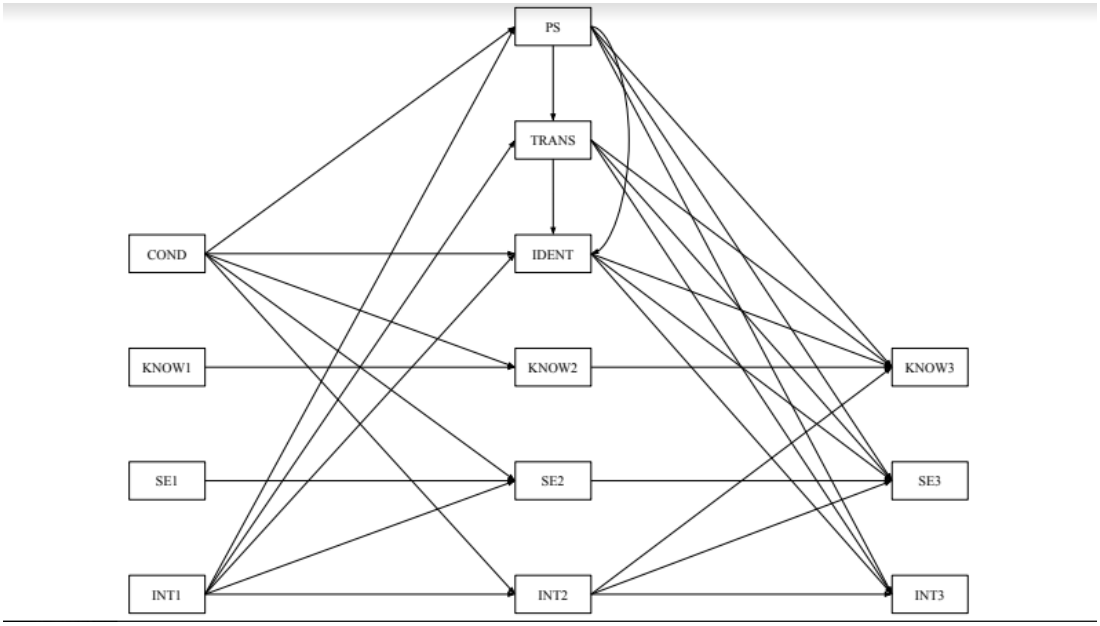

Figure 2. *Hypothesized Model*
COND = Condition, PS = Perceived Similarity, TRANS = Transportation, IDENT = Identification, KNO = Knowledge of HPV Vaccine, SE = Self-Efficacy, INT = Intention to Vaccinate.

Method

Participants

One-hundred and fifty-four female participants, ages 18 to 26 (M_{age} = 19.80, *SD* = 2.08) were recruited from the University of Texas at El Paso (UTEP) Introduction to Psychology research pool. Additionally, participants were recruited from classrooms, fliers and e-mails shared across the UTEP campus. Students were eligible to participate in the study if they were between 18 to 26 years of age, female, self-identified as Mexican-American or a non-Latina White and had not completed the HPV vaccine shot series. Mexican-American participants were randomly assigned to receive either the fotonovela (*n* = 60) or the CDC fact sheet (*n* = 53). Due to recruitment issues, however, one cell in the design was omitted. Specifically, non-Latina Whites were not recruited and administered the CDC fact sheet. Non-Latina White participants were only assigned to read the fotonovela (*n* = 41). Table 1 presents additional demographic characteristics by condition. Figure 3 shows the process of randomization.

A power analysis using G-Power indicated that 199 participants (50 participants per condition) were needed to provide an 80% chance of detecting a moderate effect (*d* = .40) of the culturally-tailored fotonovela on intention to perform modelled behavior with α = .05. The power analysis using G-Power was informed by a previous study assessing the impact of a culturally-tailored fotonovela on HPV vaccine behavioral intentions (Landrau-Cribbs, 2018). The previous study found a medium effect (*d* = .45) of the culturally-tailored fotonovela on HPV vaccine behavioral intentions. It should be noted that the power analysis for the current study was informed by the original study design which included four conditions (i.e., non-Latina Whites who read the CDC fact sheet, non-Latina Whites who read the fotonovela, Mexican Americans who read the CDC fact sheet, and Mexican Americans who read the fotonovela).

Due to difficulty recruiting non-Latina White participants, one condition (i.e., non-Latina Whites who read the CDC fact sheet) was dropped half-way through data collection.

The method of not-close fit was employed to estimate the sample size for the SEM, as recommended by MacCallum, Browne, and Sugawara (1996). Quantpsy.org (Preacher & Coffman, 2006) was used to derive R syntax (R Core Team, 2020) using the following: alpha = .05, df = 44, power = .80, null RMSEA = .00, and alternative RMSEA = .08. R (R Core Team, 2020) yielded an estimated sample size of 102.7344 ~ 103 participants needed for the analysis. The proposed model was tested using the 101 participants from both fotonovela conditions (i.e., Mexican Americans and non-Latina Whites who read the fotonovela).

Measures

Knowledge about HPV and the Vaccine (Appendix A). A 17-item questionnaire was developed to assess knowledge of HPV and the HPV vaccine. The questionnaire included the following subscales for awareness of HPV (question 1), knowledge of HPV (questions 2-7, α = .52 in an undergraduate student sample; Landrau-Cribbs, 2018) and knowledge of the HPV vaccine (questions 8-17, α = .51 in an undergraduate student sample, Landrau-Cribbs, 2018). A sample item for awareness of HPV: "Have you ever heard of the Human Papillomavirus (HPV) before today?" A sample item for knowledge of HPV: "HPV infection can go away without treatment." A sample item for knowledge of the HPV vaccine: "You are in the age group that health officials recommend get the HPV vaccine." Response options were Yes, No, and Don't Know. Knowledge scores were calculated by counting the number of correctly marked items, with higher scores indicating greater knowledge. HPV and HPV vaccine Knowledge was assessed at pre-test, immediate post-test and a 7-day follow-up. Scores on HPV knowledge and HPV vaccine knowledge were included in the Mixed ANOVAs and mediation model.

Self-Efficacy to perform modelled behaviors (Appendix B). An 8-item questionnaire was included to assess self-efficacy. The items were adapted from a previous measure ($\alpha = .85$ in a sample of young adults; Moyer-Gusé, Chung, & Jain, 2011). Eight items asked participants to report how confident they were that they could perform the same behaviors modelled in the fotonovela. For example, items measured participants' confidence to: (a) discuss the HPV vaccine with your mother, (b) discuss the HPV vaccine with a health care provider, (c) discuss the HPV vaccine with a friend, and (d) get the HPV vaccine within the next 30 days. Response options ranged from (1) not at all confident to (5) extremely confident. Responses were averaged with higher scores indicating greater self-efficacy to perform the modelled behaviors. Self-efficacy to perform modelled behaviors was assessed at pre-, post- and at the one-week follow-up. Scores on self-efficacy to perform modelled behaviors were included in the Mixed ANOVAs and mediation model.

Intention to perform modelled behaviors (Appendix C). An 8-item questionnaire was administered to assess behavioral intentions. Items were adapted from a previous measure designed to assess intentions to engage in several HPV-related behaviors over the next 12 months ($\alpha = .92$ in a sample of young adults; Moyer-Gusé, Chung, & Jain, 2011). Sample items included the following, Please indicate how confident you are that you can perform the following behaviors: (a) discuss the HPV vaccine with your mother, (b) discuss the HPV vaccine with a healthcare provider, (c) discuss the HPV vaccine with a friend, and (d) get the HPV vaccine within the next 30 days. Response options ranged from (1) definitely will not to (7) definitely will (Moyer-Gusé, Chung, & Jain, 2011). Responses were averaged with higher scores indicating greater intention to perform the modelled behaviors. Intention to perform modelled behaviors was assessed at pre-test, immediate post-test and 7-day follow-up. Scores on the

'intention to perform modelled behaviors' task were included in the Mixed ANOVAs and mediation model.

Perceived Similarity (Appendix D). A 4-item questionnaire was administered to assess the respondent's perceived similarity with Sofia and Carla in the fotonovela. Three items included: (a) I feel Sofia/Carla and I have many things in common, (b) Sofia/Carla and I are similar in many ways, and (c) there are many similarities between Sofia/Carla and myself. Items were taken from a previous study ($\alpha = .93$ in an undergraduate student sample; Cohen, Weimann-Saks, & Mazor-Tregerman, 2018). Response options ranged from (1) not at all similar to (5) extremely similar. Responses were averaged with higher scores indicating greater perceived similarity to Sofia/Carla. In addition to the 3 items, participants were asked to explain why they perceived themselves as similar and/or dissimilar to Sofia and Carla. The three quantitative items were averaged with higher scores indicating greater perceived similarity between the respondent and character. The qualitative item was not analyzed. Perceived similarity was only assessed at the immediate post-test for participants who read the fotonovela. Scores on perceived similarity were included in the mediation model.

Transportation Scale (Appendix E). A 10-item questionnaire was administered to assess transportation into the narrative. The scale demonstrates high internal consistency within an undergraduate student sample ($\alpha = .76$ in an undergraduate student sample; Green & Brock, 2000). Additionally, scores on the transportation scale have been significantly associated with scores on the Tellegen Absorption scale which indicate the degree to which individuals become absorbed into real life experiences ($r(59) = .24$, $p < .05$; Tellegen, 1982). The latter finding provides initial evidence of convergent validity of the measure; Green & Brock, 2000). Sample items include: "I could picture myself in the scene of the events described in the narrative" and

"I wanted to learn how the narrative ended". Response options ranged from (1) not at all to (5) extremely. Item 1 ("While I was reading the narrative, activity going on in the room around me was on my mind"); item 4 ("After finishing the story, I found it easy to put it out of my mind"); and 9 ("I found my mind wandering while reading the story") are reverse-coded. Scores were averaged with higher scores reflecting greater transportation (Green & Brock, 2000). Transportation items were included at the immediate post-test for participants who read the fotonovela. Scores on transportation were included in the mediation model.

Identification (Appendix F). A 15-item questionnaire was included to assess identification with Sofia/Carla (Cohen, 2001). Sample items included: "While reading the fotonovela, I forgot myself and was fully absorbed"; "I was able to understand the events in the fotonovela in a manner similar to that in which (Sofia/Carla) understood them"; "While viewing the show I could feel the emotions (Sofia/Carla) portrayed". Response options ranged from (1) not at all to (5) extremely. Scores were averaged for identification with Sofia, with higher scores reflecting greater identification with Sofia. Identification questions were completed at the immediate post-test by participants who read the fotonovela. Scores on identification were included in the mediation model.

Sociodemographic Questionnaire (Appendix G). A 13-item sociodemographic questionnaire assessed the participants' demographic information, including: age, gender, marital status, current relationship status, current student classification, ethnicity, sexual orientation, and current city. In order to assess use and access to health services, participants reported whether or not they had a primary healthcare provider, their last regular check-up, the location where they typically sought healthcare, health insurance status and type. Some questions were taken from a

previous sociodemographic questionnaire (Lechuga, Swain, & Weinhardt, 2011). Sociodemographic questions were included at the immediate post-test for all participants.

Sexual Health History Questionnaire (Appendix H). A 23-item questionnaire was adapted from a previous study (Lechuga, Swain, & Weinhardt, 2011). The questions assessed the participants' HPV vaccine status, history of pap smear tests, sexual activity, and STIs. The following are three sample items: 1) "If you have been vaccinated against HPV, how many doses/shots of the HPV vaccine have you received?"; 2) "Do you get a yearly Papanicolaou test (also known as Pap smears, cervical screenings or well woman's tests)?" ; and 3) "Have you ever had sex?" Response options for HPV vaccine status was: 1 dose/shot, 2 doses/shots, all 3 doses/shots, and don't know/unsure. Response options for history of pap smear tests: "Yes", "No", and "Don't Know". Response options for history of sexual activity: "Yes", "No", and "Don't Know". The psychometric properties of the scale have not been reported. Sexual health history questions were included at the immediate post-test for all participants.

Marlowe-Crowne Social Desirability Scale (Appendix I). A 13-item questionnaire was administered to assess social desirability (Reynolds, 1982). Sample items include: "I have never deliberately said something that hurt someone's feelings", "I'm always willing to admit when I make a mistake" and "It is sometimes hard for me to go on with my work if I am not encouraged." Response options for all questions were "yes" or "no". The Cronbach's alpha was .65 in a sample of female college students (Loo & Thorpe, 2000) and .76 in a sample of college students and community members (Neville et al., 2000). Social desirability questions were administered at the immediate post-test to all participants. Social desirability scores were not included in any of the analyses.

Abbreviated Multidimensional Acculturation Scale (AMAS; Appendix J). A 42-item questionnaire developed by Zea, Asner-Self, Birman & Buki (2003) assessed U.S. acculturation and Latina acculturation. The adapted questionnaire includes the following subscales for U.S. and Latina acculturation: U.S. identity (questions 1-6, $\alpha = .96$ in a college sample), Latino Identity (questions 7-12, $\alpha = .90$ in a college sample), English language competence (questions 13-21, $\alpha = .96$ in a college sample), Spanish language competence (22-30, $\alpha = .97$ in a college sample), U.S. cultural competence (31-36, $\alpha = .90$ in a college sample), and Latino/Latina cultural competency (37-42, $\alpha = .93$ in a college sample). A sample item for U.S. identity: "I think of myself as being U.S. American." A sample item for English language competence: "How well do you speak English in general?" A sample item for Spanish language competence: "How well do you speak Spanish with family?" Response options for all questions ranged from 1 (Not at All) to 5 (Very much). Scores for U.S. cultural identity, English language competence and U.S. cultural competence can be averaged to calculate a total U.S. acculturation score ($\alpha = .94$ in a college sample). Similarly, scores obtained from subscales assessing Latino cultural identity, Spanish language competence and Latino/Latina cultural competence can be averaged to calculate a total Latino/Latina acculturation ($\alpha = .94$ in a college sample). The AMAS scale was administered at the immediate post-test to Mexican-American participants and means and standard deviations were reported for each subscale.

Fotonovela Scale (Appendix K). A 7-item questionnaire was developed to assess respondents' perception of Sofia and Carla. Six questions asked respondents to indicate Sofia's and Carla's age, ethnicity, and college status (student versus non-student). An additional open-ended question asked participants to report the setting at the beginning of the story to check if they read the fotonovela (item: "Where did Sofia, Carla, and Ana first meet in the story?"). The

fotonovela scale was administered at the immediate post-test to all students who were assigned to read the fotonovela. Frequencies were included to indicate the percentage of students who perceived Sofia and Carla as similar in terms of their age, ethnicity, and college status.

Culturally-tailored Fotonovela

The *How did this even Happen*? fotonovela is 9 pages long and contains 894 words (See Appendix L for fotonovela and Appendix M for the fotonovela script). Thirty-eight photos were included within the fotonovela depicting the storyline. Discussions between the characters were shown through word bubbles similar to a comic book. Characters included Carla, Sofia, Ana, Sofia's mother, Sofia's aunt and the pharmacist at Walgreens. All characters, excluding the pharmacist, were depicted as Mexican American. Characters were depicted as Mexican American through the use of cultural cues, including: names (e.g., Sofia), language (e.g., Quince), Food (e.g., picadillo), location (Juárez) and images (e.g., Virgin of Guadalupe; See appendix N for a list and frequency of cultural cues presented in the fotonovela). The main characters, Carla, Ana, and Sofia, were between the ages of 18 to 26 years old in order to create greater similarity between the characters in the fotonovela and the participants.

Within the fotonovela, Carla defines HPV, reports the prevalence of HPV, states that transmission can occur with or without a condom, discusses the importance of the HPV vaccine in preventing HPV, and shares her emotions regarding the diagnosis of HPV to Sofia and Ana. Carla mentions how she learned about the diagnosis through the pap smear test (a form of screening), explains the pap smear procedure, and she reminds her friends to schedule a pap smear for themselves. She also discusses the potential consequences of HPV. She told her friends that HPV could lead to genital warts, penile or cervical cancer; however, she currently had no symptoms. She expresses concern regarding the costs of treatment and explains how the doctor

will treat her precancer cells. Before Carla leaves Sofia and Ana, she recommends that they get vaccinated against HPV and asks them if they have been vaccinated. Ana reports that she had been vaccinated and the number of shots she received. Sofia did not know if she has been vaccinated so she leaves Ana to check with her mother. Sofia's mother mentions the cultural value of waiting until marriage to have sex. Both Sofia and Sofia's aunt tell Sofia's mother the importance of preventing cancer by getting the HPV vaccine. The next day, Sofia and her mom visit Walgreens to get Sofia's next HPV vaccine shot. The pharmacist informs Sofia of who is eligible to receive the HPV vaccine, her eligibility, the HPV vaccine shot schedule, the importance of the pap smear test and the prevalence of HPV-related cervical cancer. After she receives the next HPV vaccine shot, the pharmacist reminds Sofia to get her last HPV vaccine and a pap smear test to screen for cervical cancer (Landrau-Cribbs, 2018).

CDC Fact Sheet

The Genital HPV Infection - CDC Fact Sheet is three pages with 1,165 words (See Appendix O). Three photos are included depicting male and female individuals who appear ethnically diverse (e.g., African American and Caucasian). Also, 13 web links are included to provide further information related to HPV treatment, STD information in general, HPV, HPV vaccination, and Cervical Cancer-related information and resources. The fact sheet defines HPV as a STI that can either have no symptoms, lead to genital warts or several types of cancer. All possible modes of transmission are cited in the fact, as is the most common modes of transmission. The fact sheet includes the prevalence of HPV and HPV-related genital warts and cervical cancer within the United States each year. The CDC fact sheet also mentions the characteristics (size and shape) of genital warts and the type of HPV–related cancers (vulva, vagina, penis, anus or throat) you can develop. Treatment for genital warts and precancer are

mentioned briefly. The CDC fact sheet provides several recommendations for preventing or avoiding HPV including: using a condom when engaging in sexual activity, having sex in a mutually monogamous relationship, screening using a pap smear test and testing for cervical cancer for women 30 years and older. Routine cervical cancer screenings are also recommended for women who are pregnant and have HPV. The CDC fact sheet also mentions who should get vaccinated against HPV. The HPV vaccine is recommended for certain age groups, the shot is safe and effective, and the shot schedule is included. The CDC fact sheet also recommends the vaccine for gay and bisexual men, individuals living with HIV/AIDS and individuals with a compromised immune system (Landrau-Cribbs, 2018).

Fotonovela and CDC Fact Sheet

The culturally-tailored fotonovela *How did this even Happen?* included fewer words (894 words) and more pictures (38 photos) than the Genital HPV infection - CDC fact sheet (1,165 words and 3 photos). There were five types of cultural cues (i.e., name, phrases/languages, images, location, food) included in the fotonovela. For example, two food-related items (i.e., Picadillo and Tajín) were both mentioned once, one location in Mexico was mentioned once (i.e., Juárez), and three images were included – Huaraches and the cross were shown once but the Virgin of Guadalupe was displayed three times (see Appendix M for all cultural cues). No cultural cues were presented in the Genital HPV infection - CDC fact sheet. Additionally, the culturally-tailored fotonovela did not include any weblinks whereas the CDC fact sheet included 13 weblinks providing further information related to HPV and STDs. Finally, both the culturally-tailored fotonovela and Genital HPV infection - CDC fact sheet included HPV and HPV vaccine knowledge facts. Three out of the five HPV knowledge facts were presented more frequently in the CDC fact sheet and two out of the five HPV knowledge facts were presented at

the same frequency in the CDC fact sheet and culturally-tailored fotonovela. Six out of the nine HPV vaccine knowledge facts were presented at the same frequency in both the CDC fact sheet and culturally-tailored fotonovela, two facts were presented more frequently in the culturally-tailored fotonovela, and one fact was presented more frequently in the CDC fact sheet. See Appendix P indicating the number of HPV/HPV vaccine knowledge items mentioned in both the fotonovela and CDC fact sheet.

Procedure

Online surveys were created and hosted on SurveyMonkey. Separate online surveys were developed for each condition and included either the culturally-tailored fotonovela or CDC fact sheet. Each online survey was pilot tested with undergraduate students from the Psychology department. During the pilot testing phase, ten undergraduate students were recruited via SONA-Systems to pilot test the measures and manipulations (i.e., culturally-tailored fotonovela and CDC fact sheet) included in the online survey. After signing up on SONA-Systems, students came to the research lab on their assigned time and day. Students were asked to complete each version of the survey online in order to identify any issues with the survey and make recommendations to improve their experience completing the survey. After students completed pilot-testing the survey, they were assigned 1.5 SONA credits via SONA-Systems.

During the testing phase, students signed-up for the study via SONA-Systems or e-mail. After signing up on SONA-Systems or contacting the researcher via e-mail, students were screened for eligibility. In order to assess eligibility, participants were asked via e-mail to report whether or not they were either Mexican American or non-Latina White, female, between 18 to 26 years old and had completed the HPV vaccine shot series. After they replied with a confirmation that they met the eligibility criteria,

eligible Mexican American participants were randomly assigned to read the fotonovela (Experimental condition) or the CDC fact sheet(control condition) using an online random number generator (www.random.org). A randomization log was maintained by the researcher. Non-Latina White participants were only assigned to the fotonovela condition. All participants were sent a participant code to enter for the initial survey and follow-up survey in order to identify if there were duplicate submissions and match initial and follow-up survey data.

All participants were sent a weblink for the initial survey (including the pre-test survey, fotonovela or CDC fact sheet and the immediate post-test survey) prompting them to read and sign the informed consent form. Participants in all three conditions received an identical pre-test survey packet, including measures assessing: HPV knowledge and HPV vaccine knowledge, self-efficacy to perform modelled behaviors, and intention to perform modelled behaviors. After completing the pre-test survey packet, participants read either the CDC fact sheet or fotonovela. After reading either the CDC fact sheet or fotonovela, participants received the immediate post-test survey packet, including measures assessing: HPV knowledge and HPV vaccine knowledge, self-efficacy to perform modelled behaviors, intention to perform modelled behaviors, demographics, and sexual health history. Participants who read the fotonovela received additional surveys assessing the following: Identification, Perceived Similarity, Transportation, and the characters in the Fotonovela. Only participants who self-identified as Mexican-American were prompted to complete the Abbreviated Multidimensional Acculturation Scale. After completing the immediate post-test survey, all participants were informed that they would receive a follow-up survey in 7-10 days. The one-week follow-up survey assessed HPV and HPV vaccine knowledge, self-efficacy to perform modelled behaviors, intention to perform modelled

behaviors, and performance of modelled behaviors. At completion of the one-week follow-up survey, participants were provided a copy of the CDC fact sheet with additional information about the HPV vaccine from the CDC. Students were either rewarded $15.00 in person or via Venmo (a mobile payment service owned by PayPal) for completing all of the surveys or 1 hour of SONA credit for completing the immediate post-test survey and an additional ½ hour of SONA credit for completing the one-week follow-up survey.

Design

The present study used a 2 (ethnicity: Mexican American and non-Latina White) x 2 (delivery format: fotonovela and CDC fact sheet) repeated measures design. Due to recruitment issues, however, one cell in the design was omitted. Specifically, non-Latina Whites were not recruited and administered the CDC fact sheet. Thus, Mexican American participants were randomly assigned to receive either the CDC fact sheet or fotonovela. Non-Latina White participants were assigned to only receive the fotonovela. Assessment of outcome measures were taken at three-time points (pre-test, immediate post-test, and one-week follow-up).

Analytic Strategies

Descriptive statistics were computed for all demographic variables (e.g., age and insurance status) as well as for HPV status, HPV vaccine history, and Pap smear test history. Outcomes at pre-test were assessed for ethnic differences (see Table 2). Four Mixed ANOVAs were conducted to assess the effect of the fotonovela on the following dependent variables: (a) knowledge of HPV, (b) knowledge of the HPV vaccine (c) self-efficacy to perform the modelled behaviors, and (d) intention to perform the modelled behaviors. Condition (Mexican Americans who received the fotonovela, Mexican Americans who read the CDC fact sheet, and non-Latina Whites who read the fotonovela) was entered as the between-subjects factor. Time (pre-test,

immediate post-test and one-week follow-up) was entered as the within-subjects variable. Multiple comparisons were conducted between groups to determine which gains from pre-test to immediate post-test, immediate post-test to one-week follow-up, and pre-test to one-week follow-up were significantly different. Reliability estimates of measures are included in Table 3.

For the path analysis, means were calculated from each scale to create measured variables (see Table 3 for scale means and Tables 4-8 for item intercorrelations). The hypothesized model (see Figure 1) was fitted in M*plus* v7 (Muthén & Muthén, 2012) using MLR estimation to handle non-normality. The mediated paths in the hypothesized model were tested using bias-corrected 95% confidence intervals at 10,000 bootstraps. Recommendations from Hu and Bentler (1999) for thresholds of good and acceptable fit values were followed: Root Mean Square Residuals (RMSEA) < .05 is good, Comparative Fit Index (CFI) > .95 is good, and SRMR <.05 is good, $\chi 2$: p > .05 is good; also RMSEA < .08 is acceptable, CFI > .90 is acceptable, and SRMR <.08 is good.

Results

Demographic Characteristics

Participants in the study were 154 undergraduate students living in El Paso (*n* = 143, 92.9%), Juarez (*n*= 10, 6.5%), or another location (*n* = 1, 0.6%). On average, Mexican American participants rated themselves as more competent in English (*M* = 3.86, *SD* = .0.31, min - max = 2.78 - 4.00; scale ranges from 1-5) than Spanish (*M* = 3.13, *SD* = .98, min - max = 1.00 - 4.00; scale ranges from 1-5). On average, Mexican American participants also identified more with U.S. culture (*M* = 3.11, *SD* = 0.66, min – max = 1.00 -4.00; scale ranges from 1-5) than Latino culture (*M* = 2.26, *SD* = 0.85, min – max = 1.00-4.00; scale ranges from 1-5). One-hundred and six participants reported having health insurance. Participants who currently had health insurance reported having either private insurance "through my job" (*n* = 4), private insurance "from my parents" (*n* = 78), government assisted insurance (*n* = 22), or received healthcare from the UTEP healthcare center (*n* = 5), or "I don't know" (*n* = 21). Ninety-five participants reported having a primary healthcare provider. Participants sought healthcare from either 6a hospital (*n* = 19), community clinic (*n* = 45), healthcare clinic (*n* = 37), a clinic in Juarez (*n* = 33), Juarez pharmacy (*n* = 6), the UTEP health center (*n* = 7), doctor's clinic (*n* = 88), or another location (*n* = 6). See Table 1 for additional demographics.

HPV Vaccination Barriers

Participants reported several barriers to HPV vaccination at immediate post-test including: vaccine costs ("the vaccine costs too much", *n* = 17), vaccine regimen ("the vaccine needs three shots", *n* = 17), vaccine safety ("the vaccine is unsafe", *n* = 3), vaccine knowledge ("I need more information on the vaccine", *n* = 42), HPV knowledge ("I need more information on HPV", *n* = 34), fear of needles ("I am afraid of needles", *n* = 20), embarrassment ("I am

embarrassed to request the vaccine", *n* = 14), perceived risk of HPV ("I am not at risk for HPV", *n* = 8), age ("I am too old to get the vaccine", *n* = 0), a healthcare provider recommendation ("My doctor has not recommended I get the vaccine", *n* = 20), parental objection ("My parents do not want me to get the HPV vaccine", *n* = 10), spouse objection ("My spouse/partner does not want me to get the vaccine", *n* = 0), and other reasons ("other", *n* = 21).

Validity of fotonovela characters

All participants who read the fotonovela completed the fotonovela survey which assessed participants' perceptions of Sofia's and Carla's age, ethnicity, and university/college enrollment status. For Mexican American participants who read the fotonovela, 92.7% of participants indicated that Sofia was in college/university, 92.7% indicated that Sofia was Mexican American and an average age of 20.70 years old (*SD* = 1.80; min - max = 18-25). Additionally, 90.9% of Mexican American participants indicated that Carla was in college/university, 80.0% indicated that Carla was Mexican American and an average age of 20.70 years old (*SD* = 1.58). For non-Latina White participants who read the fotonovela, 80.4% of participants indicated that Sofia was in college/university, 80.4% indicated that Sofia was Mexican American and an average age of 19.76 years old (*SD* = 1.65, min - max = 18-26). Additionally, 82.6% of Mexican American participants indicated that Carla was in college/university, 78.3% indicated that Carla was Mexican American and an average age of 20.11 years old (*SD* = 1.97, min - max = 17-27).

Comparison of all three conditions for each outcome

HPV Knowledge

There was a significant main effect of assessment time on HPV knowledge, $F(2,226) = 228.26$, $p < .001$. There was not a significant main effect of condition on HPV knowledge, $F(2,113) = .66$, $p = .52$. Additionally, there was a significant interaction between condition and

assessment time, $F(4,226) = 2.85$, $p = .03$. Mean differences from pre-test to the immediate post-test were significantly greater for Mexican Americans who read the fotonovela in comparison to Mexican Americans who read the CDC fact sheet, $F(1,111) = 4.39$, $p = .04$. Mean differences from immediate post-test to one week follow-up were not significantly different between Mexican Americans who read the fotonovela and Mexican Americans who read the CDC fact sheet, $F(1,87) = .53$, $p = .46$. Mean differences from pre-test to one week follow-up were not significantly different between Mexican Americans who read the fotonovela and Mexican Americans who read the CDC fact sheet, $F(1,87) = 1.14$, $p = .29$. Mean differences from pre-test to the immediate post-test were significantly greater for Mexican Americans who read the fotonovela in comparison to Non-Latina Whites who read the fotonovela, $F(1,99) = 15.06$, $p < .001$. Mean differences from immediate post-test to one week follow-up were not significantly different between Mexican Americans who read the fotonovela and Non-Latina Whites who read the fotonovela, $F(1,74) = .12$, $p = .73$. Mean differences from pre-test to one week follow-up were significantly greater for Non-Latina Whites who read the fotonovela than Mexican Americans who read the fotonovela, $F(1,74) = 5.65$, $p = .02$. See Table 9 for condition means at each time point.

HPV Vaccine Knowledge

There was a significant main effect of assessment time on HPV Vaccine knowledge, $F(2,226) = 408.68$, $p < .001$. There was not a significant main effect of condition on HPV Vaccine knowledge, $F(2,113) = 1.26$, $p = .29$. Additionally, there was a significant interaction between condition and assessment time, $F(4,226) = 4.57$, $p = .001$. Mean differences from pre-test to the immediate post-test were significantly greater for Mexican Americans who read the fotonovela in comparison to Mexican Americans who read the CDC fact sheet, $F(1,111) = 8.10$,

p = .005. Mean differences from immediate post-test to one week follow-up were significant for Mexican Americans who read the fotonovela in comparison to Mexican Americans who read the CDC fact sheet, $F(1,87) = 18.33$, $p < .001$. Mean differences from pre-test to one week follow-up were not significantly different between Mexican Americans who read the fotonovela and Mexican Americans who read the CDC fact sheet, $F(1,87) = .54$, $p = .47$. Mean differences from pre-test to the immediate post-test were marginally significant for Mexican Americans who read the fotonovela in comparison to Non-Latina Whites who read the fotonovela, $F(1,99) = 3.36$, $p = .07$. Mean differences from immediate post-test to one week follow-up were not significantly different between Mexican Americans who read the fotonovela and Non-Latina Whites who read the fotonovela, $F(1,74) = .96$, $p = .33$. Mean differences from pre-test to one week follow-up were not significantly different between Mexican Americans who read the fotonovela and Non-Latina Whites who read the fotonovela, $F(1,74) = .45$, $p = .48$. See Table 10 for condition means at each time point.

Self-Efficacy to Perform Modelled Behaviors

There was a significant main effect of assessment time on self-efficacy, $F(2,226) = 3.37$, $p = .04$. There was a significant main effect of condition on self-efficacy, $F(2,113) = 3.09$, $p = .05$. Additionally, there was not a significant interaction between condition and assessment time, $F(4,226) = .90$, $p = .46$. Mean differences from pre-test to the immediate post-test were not significantly different for Mexican Americans who read the fotonovela in comparison to Mexican Americans who read the CDC fact sheet, $F(1,111) = .14$, $p = .71$. Mean differences from immediate post-test to one week follow-up were not significantly different for Mexican Americans who read the fotonovela in comparison to Mexican Americans who read the CDC fact sheet, $F(1,87) = .07$, $p = .79$. Mean differences from pre-test to one week follow-up were

not significantly different between Mexican Americans who read the fotonovela and Mexican Americans who read the CDC fact sheet, $F(1,87) = .53$, $p = .47$. Mean differences from pre-test to the immediate post-test were not significantly different for Mexican Americans who read the fotonovela in comparison to Non-Latina Whites who read the fotonovela, $F(1,99) = .93$, $p = .34$. Mean differences from immediate post-test to one week follow-up were not significantly different between Mexican Americans who read the fotonovela and Non-Latina Whites who read the fotonovela, $F(1,74) = .29$, $p = .59$. Mean differences from pre-test to one week follow-up were not significantly different between Mexican Americans who read the fotonovela and Non-Latina Whites who read the fotonovela, $F(1,74) = 1.12$, $p = .29$. See Table 11 for condition means at each time point.

Intentions to Perform Modelled Behaviors

There was a significant main effect of assessment time on intentions, $F(2,226) = 20.94$, $p < .001$. There was a marginally significant main effect of condition on intentions, $F(2,113) = 2.86$, $p = .06$. Additionally, there was a significant interaction between condition and assessment time, $F(4,226) = 2.10$, $p = .08$. Mean differences from pre-test to the immediate post-test were significantly greater for Mexican Americans who read the fotonovela in comparison to Mexican Americans who read the CDC fact sheet, $F(1,111) = 10.99$, $p = .001$. Mean differences from immediate post-test to one week follow-up were not significantly different between Mexican Americans who read the fotonovela and Mexican Americans who read the CDC fact sheet, $F(1,87) = .75$, $p = .39$. Mean differences from pre-test to one week follow-up were not significantly different between Mexican Americans who read the fotonovela and Mexican Americans who read the CDC fact sheet, $F(1,87) = 1.55$, $p = .22$. Mean differences from pre-test to the immediate post-test were significantly greater for Mexican Americans who read the

fotonovela in comparison to Non-Latina Whites who read the fotonovela, $F(1,99) = 10.33$, $p = .002$. Mean differences from immediate post-test to one week follow-up were not significantly different between Mexican Americans who read the fotonovela and Non-Latina Whites who read the fotonovela, $F(1,74) = 1.98$, $p = .16$. Mean differences from pre-test to one week follow-up were not significantly different between Mexican Americans who read the fotonovela and Non-Latina Whites who read the fotonovela, $F(1,74) = .86$, $p = .36$. See Table 12 for condition means at each time point.

SEM Results

Mplus v7 (Muthén & Muthén, 1998-2012) software was used to conduct a structural equation model (SEM) with measured variables to test the paths in the hypothesized model (see Figure 1). Composite scores for each scale were calculated by averaging the scores across items. The direct and indirect effects in the hypothesized model were tested using bias-corrected 95% confidence intervals at 10,000 bootstraps (Fritz, Taylor, & MacKinnon, 2012; Preacher & Hayes, 2008). Recommendations from Hu and Bentler (1999) for thresholds of good and acceptable fit values were followed: Root Mean Square Residuals (RMSEA) < .05 is good, Comparative Fit Index (CFI) > .95 is good, and SRMR <.05 is good, $\chi 2$: $p > .05$ is good; also RMSEA < .08 is acceptable, CFI > .90 is acceptable, and SRMR <.08 is good. It should be noted that additional theoretical relationships were added after model specification in order to capitalize on idiosyncratic issues in the data and, thus, improve model fit indices (MacCallum, 1986; MacCallum, Roznowski & Necowitz, 1992). Specifically, condition was allowed to predict perceived similarity, transportation and identification, and intention at the immediate post-test was allowed to predict HPV vaccine knowledge and self-efficacy to model behavior at the one-week follow-up.

The multiple mediation structural equation model tested the hypothesized model to determine the influence of perceived similarity on a) knowledge of the HPV vaccine, b) self-efficacy to perform the modelled behaviors, and c) intention to perform the modelled behaviors, through mediation of transportation and identification. The model controlled for HPV vaccine knowledge, self-efficacy to perform modelled behaviors and intention to perform modelled behaviors at pre-test and at the immediate post-test. The model fit statistics indicated excellent model fit to the data, SB-scaled $\chi 2$ (27, N = 101) = 25.552, p < .5436; CFI = 1.000, TLI = 1.007, RMSEA = 0.000, SRMR = 0.048.

The Mplus syntax for the multiple mediation analysis can be found in Appendix Q. Results indicated perceived similarity was significantly predicted by intention at pre-test (β = .288, p < .001). Transportation was significantly predicted by perceived similarity (β = .164, p = .003) and intention at pre-test (β = .139, *p* = .004). Identification was significantly predicted by perceived similarity (β = .205, *p* = .009), transportation (β = .633, *p* < .001), and intention at pre-test (β = .123, *p* = .013). HPV vaccine knowledge at the immediate post-test was significantly predicted by HPV vaccine knowledge at pre-test (β = .186, *p* = .010), and HPV vaccine knowledge at the one-week follow-up was significantly predicted by identification (β = -.062, *p* = .040). Self-efficacy at the immediate post-test was significantly predicted by self-efficacy at pre-test (β = .585, *p* < .001) and intention at pre-test (β = .207, *p* < .005). Self-efficacy at the one-week follow-up was significantly predicted by intention at immediate post-test (β = .352, *p* = .001). Intention at the immediate post-test was significantly predicted by condition (β = -.564, *p* = .001) and intention at pre-test (β = .863, *p* < .001). Intention at the one-week follow-up was significantly predicted by transportation (β = .390, *p* = .026) and intention at the immediate post-test (β = .670, *p* < .001).

Indirect effects were tested for perceived similarity on a) knowledge of the HPV vaccine, b) self-efficacy to perform the modelled behaviors, and c) intention to perform the modelled behaviors via transportation and identification. The total indirect and specific indirect effects between perceived similarity and knowledge, self-efficacy and intention are displayed on Table 13. Results indicate that transportation and identification did not significantly mediate any relationship to HPV vaccine knowledge, self-efficacy or intention at follow-up. However, intention at immediate post-test significantly mediated the relationship between condition and intention at follow-up (β = -.143, p = .002, LL = -.262, UL = -.023). Also, intention at the immediate post-test significantly mediated the relationship between condition and self-efficacy at follow-up (β = -.120, p = .017), but zero is contained in the bias-corrected 95% confidence intervals (LL = -.249, UL = .010). Figure 4 shows the results of the full multiple mediation SEM and highlights the significant relationships between variables. Table 14 shows a summary of the direct effects.

Discussion

The purpose of this study was to test a culturally-tailored fotonovela that was designed to promote HPV vaccine-related intentions among Latina young adults. It was predicted that participants assigned to the fotonovela condition, a culturally-tailored intervention, would report greater gains in HPV knowledge, HPV vaccine knowledge, self-efficacy to perform modelled behaviors, and intentions to perform modelled behaviors than participants assigned to read the CDC fact sheet condition. Similarly, it was predicted that Mexican American participants who read the fotonovela would report greater gains in HPV knowledge, HPV vaccine knowledge, self-efficacy to perform modelled behaviors, and intention to perform modelled behaviors than non-Latina White participants who read the fotonovela. Results showed that Mexican American participants who read the fotonovela showed significantly greater gains in HPV knowledge and a stronger intention to perform modelled behaviors in comparison to non-Latina Whites who read the fotonovela. Additionally, Mexican American participants who read the fotonovela showed significantly greater gains in HPV knowledge, HPV vaccine knowledge, and a stronger intention to perform modelled behaviors in comparison to those who read a CDC fact sheet. Finally, transportation and identification did not serve as mediators in the model.

Comparison of Mexican American Participants in the Fotonovela and CDC Fact Sheet Condition

Results indicated that Mexican American participants who received the fotonovela had significantly greater gains from pre- to the immediate post-test in HPV knowledge and HPV vaccine knowledge compared to those who received the CDC fact sheet. Mean differences in HPV knowledge from the immediate post-test to one week follow-up and from pre-test to one week follow-up did not significantly differ between conditions. For HPV vaccine knowledge,

however, results indicated that Mexican American participants who received the fotonovela had a significantly greater decrease from the immediate post-test to one week follow-up compared to those who received the CDC fact sheet, but there were no significant differences in HPV vaccine knowledge from pre-test to one week follow-up. The effectiveness of the fotonovela condition (narrative) in comparison to the CDC fact sheet (non-narrative) is consistent with previous research (Brechman, 2010; Kilaru, Perrone, Auriemma, Shofer, Barg, & Meisel, 2014; Houts, Doak, Doak, & Loscalzo, 2006; Murphy, Frank, Chatterjee, & Baezconde-Garbanati, 2013; Wilkin et al., 2007). Since memory is story-based (Scott, Hartling, O'Leary, Archibald, & Klassen, 2012), participants may more easily store and retrieve facts embedded within a narrative (Green & Brock, 2002). The lack of a lasting effect of the fotonovela intervention after the immediate post-test for HPV knowledge and HPV vaccine knowledge may be due to the fact that there was only one exposure to the intervention (Shen & Han, 2014). Effects of entertainment education interventions on knowledge are expected to occur immediately after exposure, with changes in attitudes and behaviors occurring after knowledge gains (Shen & Han, 2014).

Additionally, there was not a significant difference in gains from pre- to immediate post-test, pre-test to one week follow-up, and immediate post-test to one week follow-up in self-efficacy to perform modelled behaviors for Mexican American participants who read the fotonovela in comparison to Mexican American participants who read the CDC fact sheet. The finding that that there was no significant difference in gains of self-efficacy to perform modelled behaviors between Mexican American participants who read the fotonovela (narrative) and who read the CDC fact sheet (non-narrative) is inconsistent with previous research (Borrayo, Rosales, & Gonzalez, 2016). This finding may be explained by the barriers to HPV vaccination noted by

participants after reading either the fotonovela or CDC fact sheet. Mexican American participants who read the CDC fact sheet reported needing additional information about HPV and the HPV vaccine, more time, and lacking health insurance. Similarly, Mexican American participants who read the fotonovela reported needing more information about HPV, needing more information about the HPV vaccine and noted time as an additional barrier to vaccination. It may be that in order to increase self-efficacy within the fotonovela condition, additional information about the HPV vaccine, HPV and local clinics with short wait times would need to be included in the story. Addressing this feedback by having Sofia model having additional conversations with either her social network (friends and family) or the healthcare provider about HPV and HPV vaccine may potentially strengthen participant self-efficacy beliefs within the fotonovela condition (Bandura & Well, 1994, Landrau-Cribbs, 2018).

Finally, results indicated that Mexican American participants who received information via the fotonovela experienced significantly greater gains from pre-test to immediate post-test in intention to perform modelled behaviors compared to participants who received the CDC fact sheet. However, Mexican American participants who received the fotonovela experienced significantly greater losses in intention from the immediate post-test to one week follow-up, but there were no significant differences in intentions from pre-test to one week follow-up. The effectiveness of the fotonovela condition (narrative) in comparison to the CDC fact sheet (non-narrative) at increasing intention is consistent with previous research (Cuesta, Martinez, & Cuesta, 2017; Lemal & Van den Bulck, 2010). The social modeling depicted in the fotonovela may have increased participants' intention to perform the same behaviors modelled within the narrative. According to Bandura (2003), if a model experiences a positive outcome from engaging in a behavior, then observers will have greater incentive to motivate them to perform

the same behavior. Similarly, if a 'model' experiences a negative outcome after engaging in a behavior, then the observer will have less incentive or motivation to perform the same behavior. So participants may have greater intentions to perform the behaviors modelled by Sofia because she experienced positive outcomes. Additionally, the fotonovela allowed for participants to observe Sofia's problem-solving skills when faced with potential barriers to HPV vaccination (Bandura, 2001). For example, Sofia modelled how to effectively discuss the HPV vaccine with a mother who fears that getting the HPV vaccine might promote sexual behavior (Landrau-Cribbs, 2018). Thus, the range of skills gained through observation, and the positive outcomes experienced by Sofia, may have increased participants' intention to perform the behaviors modelled within the narrative. With repeated exposures to the fotonovela, the fotonovela could be more effective at sustaining intentions to vaccinate over time (Shen, Sheer, & Li, 2015)

Comparison of Mexican American and non-Latina White Participants in the Fotonovela Condition

Mexican American participants who received information via the fotonovela had significant greater gains from pre- to immediate post-test in HPV knowledge compared to non-Latina White participants who received the fotonovela. Furthermore, non-Latina Whites had significantly greater decreases in HPV knowledge from pre-test to one week follow-up. However, the gains in knowledge were not significantly different between the conditions from the immediate post-test to one week follow-up. For HPV vaccine knowledge, Mexican American participants who received the fotonovela experienced marginally significant gains from pre-test to immediate post-test in comparison to non-Latina Whites who read the fotonovela. Additionally, there was not a significant difference in HPV vaccine knowledge gains

from pre- to immediate post-test, pre-test to one week follow-up, and immediate post-test to one week follow-up for Mexican American participants who read the fotonovela in comparison to non-Latina Whites who read the fotonovela. The finding that Mexican Americans experienced greater knowledge gains in comparison to non-Latina whites after reading a culturally-tailored intervention is consistent with previous research (Murphy et al., 2014). Previous research suggests that intervention tailoring leads to greater attention to the message and better message recall (Skinner, Strecher, & Hospers, 1994; Zillmann, 2006), which could be explained by self-referencing. Self-referencing occurs when message recipients process information in the narrative by relating it to themselves. This process has been shown to enhance recall of information (Dunlop, Wakefield, & Kashima, 2010; Klein & Kihlstrom, 1986), especially when the ethnicity of the characters matches the ethnicity of the message recipient (Kwai-Choi, Fernandez, & Martin, 2002).

Additionally, there was not a significant difference in gains from pre- to immediate post-test, pre-test to one week follow-up, and immediate post-test to one week follow-up in reported self-efficacy to perform modelled behaviors between Mexican American participants who read the fotonovela and non-Latina White participants who read the fotonovela. This finding may be explained by the barriers to HPV vaccination noted by participants after reading the fotonovela (as noted below). Mexican American participants who read the fotonovela reported needing more information about HPV and needing more information about the HPV vaccine. In addition, the participants noted that the additional time needed to schedule and attend vaccine appointments was also an additional barrier to vaccination. Non-Latina White participants who read the fotonovela reported needing more information about HPV vaccine side effects and noted that time was a barrier. It may be that in order to increase self-efficacy among young adults who

read an HPV-related fotonovela, additional information about the HPV vaccine, HPV, and the names of local clinics with short wait times would need to be included in the story. Addressing this feedback by having Sofia model additional conversations with either her social network (friends and family) or the healthcare provider about HPV and HPV vaccine may potentially strengthen participant self-efficacy beliefs within the fotonovela condition (Bandura & Well, 1994, Landrau-Cribbs, 2018).

Finally, results indicated that Mexican American participants who received information via the fotonovela experienced greater gains from pre-test to immediate post-test in intention to perform modelled behaviors compared to non-Latina White participants who received the fotonovela. However, there were no significant differences in intention gains when comparing Mexican Americans and non-Latina Whites from the immediate post-test to one week follow-up nor pre-test to one week follow-up. This finding may be explained by the degree of demographic similarity. For example, a recent meta-analysis assessed the effect of interventionist-recipient similarity on condom use within HIV-prevention interventions (Durantini, Albarracin, Mitchell, Earl, & Gillette, 2006). Results showed that young adults were more likely to use condoms when the interventionist was young, rather than older. Additionally, results indicated that women were more likely to change their behavior when the interventionists were of the same gender and within the same ethnic group, rather than male and of another ethnic group (Durantini, Albarracin, Mitchell, Earl, & Gillette, 2006). Mexican American participants may have perceived themselves as more similar to Sofia than non-Latina White participants. Additionally, the fotonovela may have provided more information that matched the needs of its target audience (Kim, Shi, Cappella, 2016) and/or increased perceived vulnerability of contracting HPV for Mexican Americans (Moyer-Gusé, 2008). With repeated exposures to the

fotonovela, the fotonovela could be more effective at sustaining intentions to vaccinate over time (Shen, Sheer, & Li, 2015)

Mediation: Transportation and Identification

Mediation analysis was conducted to attempt to explain the effectiveness of the culturally-tailored fotonovela at increasing the following outcomes in the Mixed Model ANOVAs: HPV vaccine knowledge, self-efficacy to perform modelled behaviors and intention to perform modelled behaviors. Although the culturally-tailored fotonovela did not increase self-efficacy to perform the modelled behaviors in comparison to the CDC fact sheet, the outcome variable was included in the mediation model because mediation effects can be present in the absence of an intervention effect (O'Rourke & Mackinnon, 2018). As indicated in the results section, transportation and identification did not mediate the relationship between perceived similarity and the outcomes assessed at follow-up: HPV vaccine knowledge, self-efficacy to perform modelled behaviors, and intention to perform modelled behaviors. The absence of a mediated effect may be due to the medium by which the intervention was delivered since entertainment education interventions have been found to be most effective when presented via television or radio and with multiple exposures over time (in comparison to a single exposure; Shen & Han, 2014).

In addition, the absence of a mediation effect may be explained by moderate character-reader perceived similarity. Demographic similarity (i.e., ethnicity, sex and age) was a requirement for the actors in the story and the majority of respondents accurately reported the actors' age and ethnicity. However, respondents' explanations for why they perceived themselves as similar did not include demographic similarity. Instead, participants compared their level of HPV and HPV vaccine knowledge, sexual status, and sexual values to Sofia's. In

order to ensure a strong character-reader match in the future, it may be helpful to assess character traits important to the target audience (when making the decision to vaccinate against HPV) in order to make the similarity between the character (Sofia) and the reader more clear (Cohen, Weimann-Saks, & Mazor-Tregerman, 2017).

However, it should be noted that intention at post-test significantly mediated the relationship between condition and intention at follow-up. This finding indicates that Mexican Americans who read the fotonovela had greater intentions one week after the intervention (i.e., one-week follow-up), which can be explained by their intention to vaccinate immediately after the intervention (i.e., immediate post-test). Meaning, the fotonovela intervention was able to sustain intentions to perform modelled behaviors for Mexican Americans over time.

Limitations and Future Directions

The current study has several limitations that need to be considered. First, only 27 non-Latina Whites completed the follow-up survey, so the comparisons made from pre-test to the immediate post-test and from the immediate post-test to the one week follow-up did not include the full sample of non-Latina Whites. Second, outcome measures were assessed at three points with pre-test and post-test occurring within minutes of each other, so participants' performance on the outcome variables may have increased due to practice effects rather than from the manipulation. However, it should be noted that concerns regarding practice effects should be minimal since a control group was included. Moreover, the mediation of intention at post-test further supports that the results are due to intervention effects as opposed to practice effects. Third, results indicated that there was a significant difference in HPV knowledge at pre-test between non-Latina Whites and Mexican Americans. Thus, results regarding HPV knowledge

should be interpreted with caution since non-Latina Whites had significantly higher HPV knowledge at pre-test.

Future studies should consider increasing incentives at follow-up in order to retain the sample. Future research should also consider underlying cultural processes (e.g., acculturation and ethnic identity), in addition to underlying mechanisms noted in the entertainment education literature (e.g., transportation, identification and emotion) in order to identify the ideal audience for the fotonovela. For example, a previous study found that culturally-tailored fotonovelas have greater effects on normative beliefs of HPV vaccine uptake for less acculturated Mexican American females in comparison to more acculturated Mexican American females (r = -.78 for descriptive norms and r = -.67 for injunctive norms; Walter, Murphy, Frank, & Baezconde-Garbanati, 2017). Considering within group differences among Mexican Americans during intervention development may help to improve the efficacy of fotonovela interventions promoting health behaviors, including HPV vaccination.

Conclusion

In conclusion, the present study was a second attempt at testing the efficacy of a culturally-tailored fotonovela aimed at promoting HPV vaccination among Latina young adults. Results revealed significantly greater gains in HPV vaccine knowledge, HPV knowledge, and intention to perform modelled behaviors for Mexican American participants who read the fotonovela in comparison to Mexican American participants who read the CDC fact sheet. Results showed that Mexican American participants who read the fotonovela showed significantly greater gains in HPV knowledge and a stronger intention to perform modelled behaviors in comparison to non-Latina Whites who read the fotonovela. Additionally, Mexican American participants who read the fotonovela showed significantly greater gains in HPV

knowledge, HPV vaccine knowledge and a stronger intention to perform modelled behaviors in comparison to those who read a CDC fact sheet. Finally, identification and transportation did not serve as mediators in the hypothesized model. Future research should consider following up on how to better match Mexican American participants to characters within the fotonovela in order to increase perceived similarity. Increasing the character-reader match and addressing the additional HPV and HPV vaccine knowledge barriers noted by participants could help to further improve the efficacy of the fotonovela. This may require increasing the length of the story in an effort to further develop the main characters and inform the audience; however, increasing text length of print narratives (beyond 400 words) has been shown to increase the effectiveness of print narratives (Shen, Sheer, & Li, 2015).

References

American Cancer Society (2018a). HPV and Cancer. Retrieved from: https://www.cancer.org/cancer/cancer-causes/infectious-agents/hpv/hpv-and-cancer-info.html

American Cancer Society (2018b). Don't Wait to Vaccinate. Retrieved from: https://www.cancer.org/content/dam/cancer-org/online-documents/en/pdf/flyers/hpv-dont-wait-to-vaccinate.pdf

Ashing, K. T., Chávez, N. R., & Serrano, M. (2016). HPV vaccine–related knowledge, beliefs, acceptability, and uptake among Latinas who prefer English and those who prefer Spanish. *Journal of health communication*, *21*(12), 1209-1216.

Bair, R. M., Mays, R. M., Sturm, L. A., & Zimet, G. D. (2008). Acceptability of the human papillomavirus vaccine among Latina mothers. *Journal of pediatric and adolescent gynecology*, *21*(6), 329-334.

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (2001). Social cognitive theory of mass communication. *Media psychology*, *3*(3), 265-299.

Bandura, A. (2003). Social cognitive theory for personal and social change by enabling media. In *Entertainment-education and social change* (pp. 97-118). Routledge.

Bandura, A. (2004). Health promotion by social cognitive means. *Health education & behavior*, *31*(2), 143-164.

Boersma, P., & Black, L. I. (2020). Human papillomavirus vaccination among adults aged 18−26, 2013− 2018. NCHS Data Brief, no 354. Hyattsville, MD: National Center for Health Statistics.

Borrayo, E. A., Rosales, M., & Gonzalez, P. (2017). Entertainment-education narrative versus nonnarrative interventions to educate and motivate Latinas to engage in mammography screening. *Health Education & Behavior*, *44*(3), 394-402.

Busselle, R., & Bilandzic, H. (2008). Fictionality and perceived realism in experiencing stories: A model of narrative comprehension and engagement. *Communication Theory*, *18*(2), 255-280.

Cabassa, L. J., Molina, G. B., & Baron, M. (2012). Depression fotonovela: development of a depression literacy tool for Latinos with limited English proficiency. *Health Promotion Practice*, *13*(6), 747-754.

Cancer (2018). HPV Vaccination: Just the Facts. Retrieved from: https://www.cancer.org/content/dam/cancer-org/online-documents/en/pdf/flyers/hpv-vaccination-just-the-facts-for-parents.pdf

Centers for Disease Control and Prevention (2018). HPV and Cancer: Rates by Race and Ethnicity. Retrieved from: https://www.cdc.gov/cancer/hpv/statistics/race.htm

Chan, A., Brown, B., Sepulveda, E., & Teran-Clayton, L. (2015). Evaluation of fotonovela to increase human papillomavirus vaccine knowledge, attitudes, and intentions in a low-income Hispanic community. *BMC research notes*, *8*(1), 615.

Cohen, J. (2001) Defining Identification: A Theoretical Look at the Identification of Audiences With Media Characters, Mass Communication & Society, 4:3, 245-264, DOI: 10.1207/S15327825MCS0403_01

Cohen, J. (2006). Audience identification with media characters. *Psychology of entertainment, 13,* 183-197.

Cohen, T. F., & Legg, J. S. (2014). Factors associated with HPV vaccine use among Hispanic college students. *Journal of allied health*, *43*(4), 241-246.

Cohen, J., Weimann-Saks, D., & Mazor-Tregerman, M. (2018). Does character similarity increase identification and persuasion?. *Media Psychology*, *21*(3), 506-528.

Colón-López, V., Fernández-Espada, N., Vélez, C., Gonzalez, V. J., Diaz-Toro, E. C., Calo, W. A., ... & Fernández, M. E. (2017). Communication about sex and HPV among Puerto Rican mothers and daughters. *Ethnicity & health*, *22*(4), 348-360.

de Graaf, A. (2014). The effectiveness of adaptation of the protagonist in narrative impact: Similarity influences health beliefs through self-referencing. *Human Communication Research*, *40*(1), 73-90.

de Graaf, A., Hoken, H., Sanders, J., & Beentjes, W. J. (2011). Identification as a mechanism of narrative persuasion. *Communication Research*, *20*, 1–22.

Elder, J. P., Ayala, G. X., Parra-Medina, D., & Talavera, G. A. (2009). Health communication in the Latino community: issues and approaches. *Annual review of public health*, *30*, 227-251.

Fernandez, M. E., Le, Y. L., Fernandez-Espada, N., Calo, W. A., Savas, L. S., Velez, C., … Colón-López, V. (2014). Knowledge, attitudes, and beliefs about human papillomavirus (HPV) vaccination among Puerto Rican mothers and daughters, 2010: A qualitative study. *Preventing Chronic Disease*, 11, 1–8. doi:10.5888/pcd11.140171

Flora, C. B., & Flora, J. L. (1978). The fotonovela as a tool for class and cultural domination. *Latin American Perspectives*, *5*(1), 134-150.

Gilkey, M. B., Calo, W. A., Moss, J. L., Shah, P. D., Marciniak, M. W., & Brewer, N. T. (2016). Provider communication and HPV vaccination: The impact of recommendation quality. *Vaccine*, *34*(9), 1187-1192.

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of personality and social psychology*, *79*(5), 701.

Green, M. C., & Jenkins, K. M. (2014). Interactive narratives: Processes and outcomes in user-directed stories. *Journal of Communication*, *64*(3), 479-500.

Guilamo-Ramos, V., Bowman, A. S., Benzekri, A., Ruiz, Y., & Beltran, O. (2019). Misalignment of sexual and reproductive health priorities among older Latino adolescents and their mothers. *Contraception*, *99*(3), 179-183.

Guilamo-Ramos, V., Dittus, P., Jaccard, J., Goldberg, V., Casillas, E., & Bouris, A. (2006). The content and process of mother—adolescent communication about sex in Latino families. *Social Work Research*, *30*(3), 169-181.

Hernandez, N. D., Daley, E. M., Young, L., Kolar, S. K., Wheldon, C., Vamos, C. A., & Cooper, D. (2017). HPV Vaccine recommendations: does a health care provider's gender and ethnicity matter to Unvaccinated Latina college women?. *Ethnicity & health*, 1-17. DOI: 10.1080/13557858.2017.1367761

Hernandez, M. Y., & Organista, K. C. (2013). Entertainment–education? A fotonovela? A new strategy to improve depression literacy and help-seeking behaviors in at-risk immigrant Latinas. *American journal of community psychology*, *52*(3-4), 224-235.

Hidalgo, L. G. (2014). *Augmented Fotonovelas: A Visual Methodology for Community Engaged Research* (Doctoral dissertation, UCLA).

Hinyard, L. J., & Kreuter, M. W. (2007). Using narrative communication as a tool for health behavior change: a conceptual, theoretical, and empirical overview. *Health Education & Behavior*, *34*(5), 777-792.

Hoeken, H., Kolthoff, M., & Sanders, J. (2016). Story perspective and character similarity as drivers of identification and narrative persuasion. *Human Communication Research*, *42*(2), 292-311.

Hopfer, S. (2009). Culture-centric narratives as health message design strategy: Developing an HPV vaccine intervention for college-aged women.

Hopfer, S., Garcia, S., Duong, H. T., Russo, J. A., & Tanjasiri, S. P. (2017). A Narrative Engagement Framework to Understand HPV Vaccination Among Latina and Vietnamese Women in a Planned Parenthood Setting. *Health Education & Behavior*, *44*(5), 738-747. DOI: 10.1177/1090198117728761

Igartua, J. J., & Barrios, I. (2012). Changing real-world beliefs with controversial movies: Processes and mechanisms of narrative persuasion. *Journal of Communication*, *62*(3), 514-531.

Iwelunmor, J., Newsome, V., & Airhihenbuwa, C. O. (2014). Framing the impact of culture on health: a systematic review of the PEN-3 cultural model and its application in public health research and interventions. *Ethnicity & health*, *19*(1), 20-46.

Javanbakht, M., Stahlman, S., Walker, S., Gottlieb, S., Markowitz, L., Liddon, N., ... & Guerry, S. (2012). Provider perceptions of barriers and facilitators of HPV vaccination in a high-risk community. *Vaccine*, *30*(30), 4511-4516.

Jeudin, P., Liveright, E., Del Carmen, M. G., & Perkins, R. B. (2014). Race, ethnicity, and income factors impacting human papillomavirus vaccination rates. *Clinical therapeutics*, *36*(1), 24-37.

Jones, M., & Cook, R. (2008). Intent to receive an HPV vaccine among university men and women and implications for vaccine administration. *Journal of American college health*, *57*(1), 23-32.

Kobetz, E., Kornfeld, J., Vanderpool, R. C., Finney Rutten, L. J., Parekh, N., O'Bryan, G., & Menard, J. (2010). Knowledge of HPV among United States Hispanic women: opportunities and challenges for cancer prevention. *Journal of Health Communication*, *15*(sup3), 22-29.

Kreuter, M. W., Green, M. C., Cappella, J. N., Slater, M. D., Wise, M. E., Storey, D., ... & Hinyard, L. J. (2007). Narrative communication in cancer prevention and control: a framework to guide research and application. *Annals of behavioral medicine*, *33*(3), 221-235.

Kumpfer, K. L., Alvarado, R., Smith, P., & Bellamy, N. (2002). Cultural sensitivity and adaptation in family-based prevention interventions. *Prevention science*, *3*(3), 241-246.

Landrau-Cribbs, E. (2018). *Development and Testing of a Culturally Tailored Intervention to Promote HPV Vaccination Intentions in Latina Young Adults*. The University of Texas at El Paso.

Lantos, H., Manlove, J., Wildsmith, E., Faccio, B., Guzman, L., & Moore, K. A. (2019). Parent-Teen Communication about Sexual and Reproductive Health: Cohort Differences by Race/Ethnicity and Nativity. *International journal of environmental research and public health*, *16*(5), 833.

Larkey, L. K., & Hecht, M. (2010). A model of effects of narrative as culture-centric health promotion. *Journal of health communication, 15*(2), 114-135.

Lau, M., Lin, H., & Flores, G. (2012). Racial/ethnic disparities in health and health care among US adolescents. *Health services research, 47*(5), 2031-2059.

Laz, T. H., Rahman, M., & Berenson, A. B. (2013). Human papillomavirus vaccine uptake among 18-to 26-year-old women in the United States: National Health Interview Survey, 2010. *Cancer*, *119*(7), 1386-1392.

Lechuga, J., Swain, G. R., & Weinhardt, L. S. (2011). The cross-cultural variation of predictors of human papillomavirus vaccination intentions. *Journal of Women's Health, 20*(2), 225-230.

Lechuga, J., Vera-Cala, L., & Martinez-Donate, A. (2016). HPV vaccine awareness, barriers, intentions, and uptake in Latina women. *Journal of immigrant and minority health*, *18*(1), 173-178.

Lee, C. K. C., Fernandez, N., & Martin, B. A. (2002). Using self-referencing to explain the effectiveness of ethnic minority models in advertising. *International Journal of Advertising*, *21*(3), 367-379.

Leshikar, E. D., Dulas, M. R., & Duarte, A. (2015). Self-referencing enhances recollection in both young and older adults. *Aging, Neuropsychology, and Cognition*, *22*(4), 388-412.

Loo, R., & Thorpe, K. (2000). Confirmatory factor analyses of the full and short versions of the Marlowe-Crowne Social Desirability Scale. *The Journal of social psychology*, *140*(5), 628-635.

MacCallum, R. (1986). Specification searches in covariance structure modeling. *Psychological bulletin, 100*(1), 107.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological methods, 1*(2), 130.

MacCallum, R. C., Roznowski, M., & Necowitz, L. B. (1992). Model modifications in covariance structure analysis: the problem of capitalization on chance. *Psychological bulletin, 111*(3), 490.

Maertens, J. A., Jimenez-Zambrano, A. M., Albright, K., & Dempsey, A. F. (2017). Using community engagement to develop a web-based intervention for Latinos about the HPV vaccine. *Journal of health communication*, *22*(4), 285-293.

McQueen, A., Kreuter, M. W., Kalesan, B., & Alcaraz, K. I. (2011). Understanding narrative effects: the impact of breast cancer survivor stories on message processing, attitudes, and beliefs among African American women. *Health Psychology*, *30*(6), 674.

McRee, A. L., Gilkey, M. B., & Dempsey, A. F. (2014). HPV vaccine hesitancy: findings from a statewide survey of health care providers. *Journal of Pediatric Health Care*, *28*(6), 541-549.

McRee, A. L., Gottlieb, S. L., Reiter, P. L., Dittus, P. J., Halpern, C. T., & Brewer, N. T. (2012). HPV vaccine discussions: An opportunity for mothers to talk with their daughters about sexual health. *Sexually transmitted diseases*, *39*(5), 394.

Meites, E., Kempe, A., & Markowitz, L.E. (2016). Use of a 2-dose schedule for human papillomavirus vaccination—updated recommendations of the Advisory Committee on Immunization Practices. *MMWR. Morbidity and mortality weekly report*, *65*.

Meneses, L. M., Orrell-Valente, J. K., Guendelman, S. R., Oman, D., & Irwin Jr, C. E. (2006). Racial/ethnic differences in mother-daughter communication about sex. *Journal of Adolescent Health, 39*(1), 128-131.

Molokwu, J., Fernandez, N. P., & Martin, C. (2014). HPV awareness and vaccine acceptability in Hispanic women living along the US-Mexico border. *Journal of immigrant and minority health, 16*(3), 540-545.

Mora, A. S., Madrigal, J. M., Jordan, L., & Patel, A. (2018). Effectiveness of an Educational Intervention to Increase Human Papillomavirus Knowledge in High-Risk Minority Women. *Journal of lower genital tract disease, 22*(4), 288-294.

Morales-Campos, D. Y., Markham, C. M., Peskin, M. F., & Fernandez, M. E. (2013). Hispanic mothers' and high school girls' perceptions of cervical cancer, human papilloma virus, and the human papilloma virus vaccine. *Journal of Adolescent Health, 52*(5), S69-S75.

Moran, M. B., Murphy, S. T., Chatterjee, J. S., Amezola-Herrera, P., & Baezconde-Garbanati, L. (2014). Mexican-American mothers' perceptions regarding vaccinating their daughters against HPV and recommended strategies to promote vaccine uptake. *Women's Reproductive Health, 1*(2), 106-119.

Moyer-Gusé, E. (2008). Toward a theory of entertainment persuasion: Explaining the persuasive effects of entertainment-education messages. *Communication theory, 18*(3), 407-425.

Moyer-Gusé, E., Chung, A. H., & Jain, P. (2011). Identification with characters and discussion of taboo topics after exposure to an entertainment narrative about sexual health. *Journal of Communication, 61*(3), 387-406.

Moyer-Gusé, E., & Nabi, R. L. (2010). Explaining the effects of narrative in an entertainment television program: Overcoming resistance to persuasion. *Human Communication Research*, *36*(1), 26-52.

Murphy, S. T., Frank, L. B., Chatterjee, J. S., & Baezconde-Garbanati, L. (2013). Narrative versus nonnarrative: The role of identification, transportation, and emotion in reducing health disparities. *Journal of Communication*, *63*(1), 116-137.

Murphy, S. T., Frank, L. B., Moran, M. B., & Patnoe-Woodley, P. (2011). Involved, transported, or emotional? Exploring the determinants of change in knowledge, attitudes, and behavior in entertainment-education. *Journal of communication*, *61*(3), 407-431.

Muthén, L. K., & Muthén, B. O. (1998-2012). Mplus User's Guide. Seventh Edition. Los Angeles, CA: Muthén et Muthén.

National Vaccine Advisory Committee. (2003). Standards for child and adolescent immunization practices. *Pediatrics*, *112*(4), 958-963.

National Vaccine Advisory Committee. (2014). Recommendations from the National Vaccine Advisory Committee: standards for adult immunization practice. *Public Health Reports*, *129*(2), 115-123.

Neville, H. A., Lilly, R. L., Duran, G., Lee, R. M., & Browne, L. (2000). Construction and initial validation of the color-blind racial attitudes scale (CoBRAS). *Journal of counseling psychology*, *47*(1), 59.

Office of Women's Health (2019). Pap and HPV tests. Retrieved from: https://www.womenshealth.gov/a-z-topics/pap-hpv-tests

O'Rourke, H. P., & MacKinnon, D. P. (2018). Reasons for testing mediation in the absence of an intervention effect: A research imperative in prevention and intervention research. *Journal of studies on alcohol and drugs*, *79*(2), 171-181.

Polonijo, A. N., & Carpiano, R. M. (2013). Social inequalities in adolescent human papillomavirus (HPV) vaccination: a test of fundamental cause theory. *Social Science & Medicine*, *82*, 115-125.

Preacher, K. J., & Coffman, D. L. (2006, May). Computing power and minimum sample size for RMSEA [Computer software]. Available from http://quantpsy.org/.

Raffaeli, M., & Green, S. (2003). Parent-adolescent communication about sex: Retrospective reports by Latino College students. *Journal of Marriage and Family, 65*, 474–481.

Rahman, M., Laz, T. H., & Berenson, A. B. (2015). Racial disparity in receiving a physician recommendation for human papillomavirus vaccine among US adolescent girls: Trend from 2008 to 2012. *Cancer Epidemiology and Prevention Biomarkers*, *24*(4), 764-764.

Reimer, R. A., Schommer, J. A., Houlihan, A. E., & Gerrard, M. (2014). Ethnic and gender differences in HPV knowledge, awareness, and vaccine acceptability among Non-Latina Whites and Hispanic men and women. *Journal of community health*, *39*(2), 274-284. DOI: 10.1007/s10900-013-9773-y

Reimer, R. A., Houlihan, A. E., Gerrard, M., Deer, M. M., & Lund, A. J. (2013). Ethnic differences in predictors of HPV vaccination: comparisons of predictors for Latina and Non-Latina Whites women. *Journal of sex research*, *50*(8), 748-756. doi: 10.1080/00224499.2012.692406

Reiter, P. L., Brewer, N. T., Gottlieb, S. L., McRee, A. L., & Smith, J. S. (2009). Parents' health beliefs and HPV vaccination of their adolescent daughters. *Social science & medicine*, *69*(3), 475-480.

Roberts, M. E., Gerrard, M., Reimer, R., & Gibbons, F. X. (2010). Mother–daughter communication and human papillomavirus vaccine uptake by college students. *Pediatrics*, *125*(5), 982–989. doi: 10.1542/peds.2009-2888.

Romo, L. F., Cruz, M. E., & Neilands, T. B. (2011). Mother-daughter communication and college women's confidence to communicate with family members and doctors about the human papillomavirus and sexual health. *Journal of pediatric and adolescent gynecology*, *24*(5), 256-262.

Romo, L. F., Bravo, M., Cruz, M. E., Rios, R. M., & Kouyoumdjian, C. (2010). "El sexo no es malo": Maternal values accompanying contraceptive use advice to young Latina adolescent daughters. *Sexuality Research and Social Policy*, *7*(2), 118-127.

Romo, L. F., Lefkowitz, E. S., Sigman, M., & Au, T. K. (2002). A longitudinal study of maternal messages about dating and sexuality and their influence on Latino adolescents. *Journal of Adolescent Health*, *31*(1), 59-69.

Rosenthal, S. L., Weiss, T. W., Zimet, G. D., Ma, L., Good, M. B., & Vichnin, M. D. (2011). Predictors of HPV vaccine uptake among women aged 19–26: importance of a physician's recommendation. *Vaccine*, *29*(5), 890-895.

Sanderson, M., Coker, A. L., Eggleston, K. S., Fernandez, M. E., Arrastia, C. D., & Fadden, M. K. (2009). HPV vaccine acceptance among Latina mothers by HPV status. *Journal of Women's Health*, *18*(11), 1793-1799.

Scarinci, I. C., Bandura, L., Hidalgo, B., & Cherrington, A. (2012). Development of a theory-based (PEN-3 and health belief model), culturally relevant intervention on cervical cancer prevention among Latina immigrants using intervention mapping. *Health promotion practice*, *13*(1), 29-40.

Schiffman, M., & Kjaer, S. K. (2003). Chapter 2: Natural history of anogenital human papillomavirus infection and neoplasia. *JNCi Monographs*, *2003*(31), 14-19.

Schmidt, S., & Parsons, H. M. (2014). Vaccination interest and trends in human papillomavirus vaccine uptake in young adult women aged 18 to 26 years in the United States: an analysis using the 2008–2012 National Health Interview Survey. *American journal of public health*, *104*(5), 946-953.

Shen, F., & Han, J. (2014). Effectiveness of entertainment education in communicating health information: a systematic review. *Asian Journal of Communication*, *24*(6), 605-616.

Shen, F., Sheer, V. C., & Li, R. (2015). Impact of narratives on persuasion in health communication: A meta-analysis. *Journal of Advertising*, *44*(2), 105-113.

Sherris, J., Friedman, A., Wittet, S., Davies, P., Steben, M., & Saraiya, M. (2006). Education, training, and communication for HPV vaccines. *Vaccine*, *24*, S210-S218.

Singhal, A., & Rogers, E. (2012). *Entertainment-education: A communication strategy for social change*. Routledge.

Singhal, A., & Rogers, E. M. (2002). A theoretical agenda for entertainment—education. *Communication theory*, *12*(2), 117-135.

Slater, M. D., & Rouner, D. (2002). Entertainment—education and elaboration likelihood: Understanding the processing of narrative persuasion. *Communication theory*, *12*(2), 173-191.

Stephens, D. P., Tamir, H., & Thomas, T. L. (2016). Factors motivating HPV vaccine uptake among vaccinated and nonvaccinated Hispanic young adult women. *Hispanic Health Care International*, *14*(4), 184-191. DOI: 10.1177/1540415316679808

Stephens, D. P., & Thomas, T. L. (2014). Social networks influence Hispanic college women's HPV vaccine uptake decision-making processes. *Women's Reproductive Health*, *1*(2), 120-137. DOI: 10.1080/23293691.2014.966034.

Tal-Or, N., & Cohen, J. (2010). Understanding audience involvement: Conceptualizing and manipulating identification and transportation. *Poetics*, *38*(4), 402-418.

Unger, J. B., Cabassa, L. J., Molina, G. B., Contreras, S., & Baron, M. (2013). Evaluation of a fotonovela to increase depression knowledge and reduce stigma among Hispanic adults. *Journal of Immigrant and Minority Health*, *15*(2), 398-406.

Unger, J. B., & Molina, G. B. (2009). Evaluation of Sweet Temptations. *Hispanic Health Care International*, *7*(3).

Valle, R., Yamada, A. M., & Matiella, A. C. (2006). Fotonovelas: A health literacy tool for educating Latino older adults about dementia. *Clinical Gerontologist*, *30*(1), 71-88.

Vastine, A., Gittelsohn, J., Ethelbah, B., Anliker, J., & Caballero, B. (2005). Formative research and stakeholder participation in intervention development. *American journal of health behavior*, *29*(1), 57-69.

Walter, N., Murphy, S. T., Frank, L. B., & Baezconde-Garbanati, L. (2017). Health Communication| Who Cares What Others Think? The Role of Latinas' Acculturation in the Processing of HPV Vaccination Narrative Messages. *International Journal of Communication*, *11*, 19.

Zambrana, R. E., Cornelius, L. J., Boykin, S. S., & Lopez, D. S. (2004). Latinas and HIV/AIDS risk factors: Implications for harm reduction strategies. *American Journal of Public Health*, *94*(7), 1152-1158.

Zea, M. C., Asner-Self, K. K., Birman, D., & Buki, L. P. (2003). The Abbreviated Multidimentional Acculturation Scale: Empirical validation with two Latino/Latina samples. *Cultural Diversity and Ethnic Minority Psychology*, *9*(2), 107.

Appendix A

Knowledge about HPV and the HPV Vaccine

Please answer the following questions regarding HPV and HPV vaccine knowledge.

1. Have you heard of Human Papillomavirus (HPV) before today?

☐ Yes ☐ No ☐ Don't know

2. Have you heard of the vaccine for the Human Papillomavirus (HPV) before today?

☐ Yes ☐ No ☐ Don't know

3. Human papillomavirus (HPV) is a sexually transmitted disease.

☐ Yes ☐ No ☐ Don't know

4. Human papillomavirus (HPV) infection can go away without treatment.

☐ Yes ☐ No ☐ Don't know

5. Human Papillomavirus (HPV) causes genital warts.

☐ Yes ☐ No ☐ Don't know

6. Human Papillomavirus (HPV) causes herpes

☐ Yes ☐ No ☐ Don't know

7. People with Human Papillomavirus might not have any symptoms.

☐ Yes ☐ No ☐ Don't know

8. The Centers for Disease Control and Prevention recommends the Human Papillomavirus (HPV) vaccine for girls and boys age 11-12 years old.

☐ Yes ☐ No ☐ Don't know

9. The Human Papillomavirus (HPV) vaccine catch up doses can be administered to individuals up to age 26.

☐ Yes ☐ No ☐ Don't Know

10. Getting regular Papanicolaou tests (also known as Pap smears, cervical screenings, or well woman's tests) reduces a woman's chances of getting cervical cancer.

☐ Yes ☐ No ☐ Don’t know

11. The Human Papillomavirus (HPV) can cause abnormal Papanicolaou tests (also known as Pap smears, cervical screenings, or well woman’s tests).

☐ Yes ☐ No ☐ Don’t Know

12. You are in the age group that health officials recommend get the HPV vaccine.

☐ Yes ☐ No ☐ Don’t know

13. The HPV vaccine works best if you get it before you start having sex.

☐ Yes ☐ No ☐ Don’t Know

14. The HPV vaccine prevents most cervical cancers.

☐ Yes ☐ No ☐ Don’t know

15. The HPV vaccine prevents most genital warts.

☐ Yes ☐ No ☐ Don’t know

16. How many needle shots are required for the HPV vaccine? _____

Appendix B

Self-Efficacy to Perform Modelled Behaviors

Please indicate how confident you are that you can perform the following behaviors.

1 = Not at All Confident 2 = Slightly Confident 3 =Moderately Confident 4 = Very Confident

5 = Extremely Confident

1. Discuss the HPV vaccine with your mother.
2. Discuss the HPV vaccine with a family member (other than your mother).
3. Discuss the HPV vaccine with a friend.
4. Discuss the HPV vaccine with a healthcare provider.
5. Search for more information about the HPV vaccine.
6. Recommend the HPV vaccine to a friend.
7. Get the HPV vaccine within the next 30 days.
8. Get the HPV vaccine within the next 12 months.

Appendix C

Intentions to Perform Modelled Behaviors

What is the likelihood that you will engage in the following behaviors over the next 12 months?

1 = Definitely will not 2 = Very Unlikely 3 = Unlikely 4 = Possibly 5 = Likely 6 = Very Likely 7= Definitely will

1. Discuss the HPV vaccine with your mother.

2. Discuss the HPV vaccine with a family member (other than your mother).

3. Discuss the HPV vaccine with a friend.

4. Discuss the HPV vaccine with a healthcare provider.

5. Search for more information about the HPV vaccine.

6. Recommend the HPV vaccine to a friend.

7. Get the HPV vaccine within the next 30 days.

8. Get the HPV vaccine within the next 12 months.

Appendix D

Perceived Similarity

Please indicate how similar you think you are to (Sofia/Carla).

1 = Not at All Similar 2 = Slightly Similar 3 =Moderately Similar 4 = Very Similar

5 = Extremely Similar

1. I feel (Sofia/Carla) and I have many things in common.
2. There are many similarities between (Sofia/Carla) and myself.
3. (Sofia/Carla) and I are similar in many ways.
4. Please explain your response to question #3 in the textbox below: (Sofia/Carla)

Appendix E

Transportation

Please indicate how engaged you were while reading the story.

1 = Not at All 2 = Slightly 3 =Moderately 4 = Very Much 5 = Extremely

1. While I was reading the narrative, activity going on in the room around me was on my mind. (R)
2. I could picture myself in the scene of the events described in the narrative
3. I was mentally involved in the narrative while reading it.
4. After finishing the narrative, I found it easy to put it out of my mind. (R)
5. I wanted to learn how the narrative ended.
6. The narrative affected me emotionally.
7. I found myself thinking of ways the narrative could have turned out differently.
8. I found my mind wandering while reading the narrative. (R)
9. The events in the narrative are relevant to my everyday life.
10. The events in the narrative have changed my life.

Appendix F

Identification with Characters

Please indicate how engaged you while reading the story.

1 = Not at All 2 = Slightly 3 =Moderately 4 = Very Much 5 = Extremely

1. While reading the story, I felt as if I was part of the action.

2. While reading the story, I forgot myself and was fully absorbed.

3. I was able to understand the events in the story in a manner similar to that in which (Sofia/Carla) understood them.

4. I think I have a good understanding of character (Sofia/Carla).

5. I tend to understand the reasons why (Sofia/Carla) does what she does.

6. While reading the story, I could feel the emotions (Sofia/Carla) portrayed.

7. While reading, I felt I could really get inside (Sofia's/Carla's) head.

8. At key moments in the story, I felt I knew exactly what (Sofia/Carla) was going through.

9. While reading the story, I wanted (Sofia/Carla) to succeed in achieving her goal.

Appendix G

Sociodemographic Questionnaire

1. What is your age? ____

2. What is your gender?

☐ Male ☐ Female ☐ Transgender Male ☐Transgender Female

3. What is your marital status?

☐ Single ☐ Married ☐ Living together

☐ Other (please specify):_____

4. What is your current relationship status?

☐Living with a sexual partner and neither of us has sex with anyone else

☐Living with a sexual partner, and one or both of us is having sex with someone else

☐In a sexual relationship, but we don't live together

☐In a non-sexual relationship

☐Not currently in a relationship

☐Other (please specify):_____

5. What is your current classification?

☐ Freshman ☐Sophomore ☐ Junior ☐ Senior ☐ Master's Student

☐ Doctoral Student ☐ Not Sure

6. Approximately, how many college/university credits have you completed thus far?

7. What do you consider your ethnicity to be?

☐ Mexican/Mexican-American ☐ Other Hispanic ☐Non-Hispanic White

☐ African American ☐ Asian/Pacific Islander ☐ American Indian

☐ Other (please specify):_____

8. What is your sexual orientation?

☐ Heterosexual ☐ Gay or Lesbian ☐ Bisexual

☐ Other (please specify): _____

9. In what city do you live?

☐ El Paso ☐ Juarez ☐ Other (please specify): _____

10. Do you have a primary health care provider?

☐ Yes ☐ No ☐ Don't Know/Unsure

11. When was the last time you got a regular check-up (medical/physical exam)?

☐ 1 month ago ☐ 6 months ago ☐ 1 year ago ☐ More than a year ago

12. From the following options, where do you typically seek healthcare?

☐ Community health care clinic ☐ Hospital ☐ UTEP student health center

☐ Juarez clinic or doctor ☐ Juarez pharmacy ☐ Doctor's clinic

☐ Other (please specify): _____

13. Do you have health insurance?

☐ Yes ☐ No (Skip Next Question)

14. What type of health insurance do you have?

☐ Private insurance through my job ☐ Private insurance through my parents

☐ Government assisted insurance (Medicare or Medicaid)

☐ Access to treatment through UTEP student health center only

Appendix H

Sexual Health History Questionnaire

Please answer the following questions regarding your sexual health history

1. Have you ever been vaccinated for Human Papillomavirus (HPV)?

☐ Yes ☐ No ☐ Don't Know

2. If you have been vaccinated against HPV, how many doses/shots of the HPV vaccine have you received?

☐ 1 dose/shot ☐ 2 doses/shots ☐ all 3 doses/shots ☐ don't know/unsure

3. At what age and where did you first get the HPV vaccine?

2. Have you been told that you have the Human Papillomavirus (HPV)?

☐ Yes ☐ No ☐ Don't Know

3. Have you ever been told that you have genital warts?

☐ Yes ☐No ☐ Don't Know

4. Has anyone you know ever received the Human Papillomavirus (HPV) vaccine?

☐ Yes ☐ No ☐ Don't Know

5. Has anyone that you were close to ever had the Human Papillomavirus (HPV)?

☐ Yes ☐ No ☐ Don't Know

6. Have you ever had a pap smear test?

☐ Yes ☐ No ☐ Don't Know

7. Do you get a yearly Papanicolaou test (also known as Pap smears, cervical screenings or well woman's tests)?

☐Yes ☐No ☐ Don't Know

8. When was your last Papanicolaou test (also known as Pap smears, cervical screenings, or well woman's tests)?

☐Less than a year ago ☐A year ago ☐2 years ago ☐3 years ago ☐4 years ago

☐More than 5 years ago ☐I have never received a Papanicolaou test

☐ Don't Know

9. Have you ever had an abnormal pap smear test?

☐ Yes ☐ No ☐ Don't Know

10. Have you ever had sex? (If no, skip to question 17)

☐ Yes ☐ No ☐ Don't Know

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

☐None ☐1-2 ☐3-5 ☐6-8 ☐9-11 ☐12-14 ☐15-17 ☐19-20 ☐21 or above ☐ Don't Know

12. Have you ever had unprotected sex?

☐ Yes ☐ No ☐ Don't Know

13. What is your main form of protection used during sex (Check all that apply):

☐None ☐Condoms ☐Hormonal method (the pill, the Patch, rings)

☐Calendar based contraceptive ☐Intrauterine Device/IUD

☐Surgical procedure (vasectomy, tube ligation) ☐Infertility

☐ My partner/or I withdraws before ejaculation

☐Other (please specify): _____

14. In the past year, how many times have you talked with a sex partner about using condoms or having safer sex?

☐Never ☐Once or Twice ☐Most of the time ☐Always

15. In the past year, how many times did you talk with a sex partner about getting tested for STDs/STIs?

☐Never ☐Once or Twice ☐Most of the time ☐Always

16. Do you rely on your partner for protection during sex?

☐ Yes ☐ No

17. Have you ever had a Sexually transmitted Infection/Disease?

☐ Yes ☐ No (if no, go to question 19) ☐ I have never been tested for them (if never tested, go to question 19)

18. What sexually transmitted disease/infection(s) have you had (check all that apply)?:

☐ Hepatitis B ☐ Hepatitis C ☐ HIV/AIDS ☐ HPV/Warts ☐ Human papillomavirus (HPV)

19. If you wanted more information about HPV and the HPV vaccine from whom would you feel most comfortable getting it?

☐ Healthcare provider ☐ friend ☐ parent ☐ other (please specify): _____

20. In your opinion, how many of your friends have received the HPV vaccine?

☐ None of them ☐ Some of them ☐ Almost all of them ☐ All of them

☐ Don't Know

21. If someone from the following list recommended the vaccine to you, who would you be more likely to listen to (Select all that apply)

☐ Healthcare provider ☐ Parent ☐ Partner/Spouse

☐ Friend ☐ Religious figure ☐ Other (please specify): _____

22. How much of the decision to vaccinate against HPV is up to you?

Not at all Very much

1 2 3 4 5 6 7

23. If the decision to vaccinate is not entirely up to you, who else shares the decision?

☐ Healthcare provider ☐ Mother ☐ Father ☐ Partner/Spouse

☐ Friend ☐ Religious figure ☐ Other (please explain):_____

Appendix I

Marlow-Crowne Questionnaire

Please answer the following questions.

1. It is sometimes hard for me to go on with my work if I am not encouraged.

☐ Yes ☐ No

2. I sometimes feel resentful when I don't get my own way.

☐ Yes ☐ No

3. On a few occasions, I have given up doing something because I thought too little of my ability.

☐ Yes ☐ No

4. There have been times when I felt like rebelling against people in authority even though I knew they were right.

☐ Yes ☐ No

5. No matter who I'm talking to, I'm always a good listener.

☐ Yes ☐ No

6. There have been occasions when I took advantage of someone.

☐ Yes ☐ No

7. I'm always willing to admit it when I make a mistake.

☐ Yes ☐ No

8. I sometimes try to get even, rather than forgive and forget.

☐ Yes ☐ No

9. I am always courteous, even to people who are disagreeable.

☐ Yes ☐ No

10. I have never been irked when people expressed ideas very different from my own.

☐ Yes ☐ No

11. There have been times when I was quite jealous of the good fortune of others.

☐ Yes ☐ No

12. I am sometimes irritated by people who ask favors of me.

☐ Yes ☐ No

13. I have never deliberately said something that hurt someone's feelings.

☐ Yes ☐ No

Appendix J
Abbreviated Multidimensional Acculturation Scale

Please answer the following questions regarding your cultural identity

Not At All (1) Very Much (5)

1. I think of myself as being U.S. American.
2. I feel good about being U.S. American.
3. Being U.S. American plays an important part in my life.
4. I feel that I am part of U.S. American culture.
5. I have a strong sense of being U.S. American.
6. I am proud of being U.S. American.
7. I think of myself as being Mexican.
8. I feel good about being Mexican.
9. Being Mexican plays an important part in my life.
10. I feel that I am part of Mexican culture.
11. I have a strong sense of being Mexican.
12. I am proud of being Mexican.
13. How well do you speak English at school or work?
14. How well do you speak English with American friends?
15. How well do you speak English on the phone?
16. How well do you speak English with strangers?
17. How well do you speak English in general?
18. How well do you understand English on television or in movies?
19. How well do you understand English in newspapers and magazines?
20. How well do you understand English words in songs?
21. How well do you understand English in general?
22. How well do you speak Spanish with family?
23. How well do you speak Spanish with friends from Mexico?
24. How well do you speak Spanish on the phone?
25. How well do you speak Spanish with strangers?
26. How well do you speak Spanish in general?
27. How well do you understand Spanish on television or in movies?
28. How well do you understand Spanish in newspapers and magazines?
29. How well do you understand Spanish words in songs?
30. How well do you understand Spanish in general?
31. How well do you know popular U.S. American national heroes?
32. How well do you know popular U.S. American television shows?
33. How well do you know popular U.S. American newspapers and magazines?

34. How well do you know popular U.S. American actors and actresses?
35. How well do you know U.S. American history?
36. How well do you know U.S. American political leaders?
37. How well do you know popular Mexican national heroes?
38. How well do you know popular Mexican television shows?
39. How well do you know popular Mexican newspapers and magazines?
40. How well do you know popular Mexican actors and actresses?
41. How well do you know Mexican history?
42. How well do you know Mexican political leaders?

Appendix K

Fotonovela Scale

1. Is Sofia in college/university? Yes No

2. Is Carla in college/university? Yes No

3. Provide your best estimate of Sofia's age: _____

4. Provide your best estimate of Carla's age: _____

5. Please indicate Sofia's ethnicity:

☐ Mexican/Mexican-American ☐ Other Hispanic ☐Non-Hispanic White

☐ African American ☐ Asian/Pacific Islander ☐ American Indian

☐ Other (please specify):_____

6. Please indicate Carla's ethnicity:

☐ Mexican/Mexican-American ☐ Other Hispanic ☐Non-Hispanic White

☐ African American ☐ Asian/Pacific Islander ☐ American Indian

☐ Other (please specify):_____

7. Where did Sofia, Carla and Ana first meet in the story? _____

Appendix M

Fotonovela Narrative

AT KINLEY'S

Ana: we won't fail this test, right?

Sofia: I mean, I think we can, so Carla needs to get here quick.

Carla: Sorry I'm late! I just got back from the doctor's office. I'm freaking out. She told me I have HPV. I didn't even think I could get a sexually transmitted infection! I've only had sex with my boyfriend and we ALWAYS use condoms. But she told me you can contract HPV even when you use a condom. She also told me to keep an eye out for genital warts and that HPV can cause cervical cancer.

Sofia: That's so scary! How do you know if you have HPV? Did you have any symptoms? Carla: I didn't have any. I found out because I had an abnormal pap smear test result. My doctor said that most people don't know that they're infected because you can have HPV without any symptoms. Some people find out because they have genital warts but I don't have any!

Sofia: What's a pap smear test?

Carla: A gynecologist swabs cells from the cervix to test for any abnormal cells. I had abnormal cells and these can turn into cervical cancer.

Ana: But you're so careful, Carla! How did this even happen? It sounds so serious.

Carla: She said it's a virus that is transmitted sexually, and that HPV can infect the areas that are not covered by a condom. It's going to be so awkward but I have to talk to Kique tonight because he must have given it to me.

Sofia: If condoms don't fully protect you from HPV, then what does?

Carla: The doctor told me there's a HPV vaccine. I didn't know about it before but I wish I would have so I could have prevented all of this.

Sofia: But how do you treat these abnormal cells?

Carla: The doctor will need to remove the abnormal cells from my cervix.

If you guys don't have the vaccine, you should get it.

Ana: Do you know how many people have HPV?

Carla: The doctor told me around 80% of sexually active people are infected with HPV at some point and most of the time it can go away on its own. She also told me that the vaccine is recommended at 11 or 12 years old because it's most effective BEFORE you've become sexually active. I never heard of the HPV vaccine before. Are you guys vaccinated?

Sofia: I don't know.

Ana: Go ask your mom. I was vaccinated. I only remember because I had to go for three shots. My little sister only needed two but she started the shots before her quince. I didn't realize that's why I got the shot and I don't know why she needed less shots than me.

Carla: Ask your mom, Sofia! I'm scared to get vaccinated so my cousin promised to go with me. I'm also going to check on the cost of treatment before I see Kique! I don't want my parents to find out so I need to leave for Juárez now before the clinic closes.

Ana: So are we going to study, Sofia?

Sofia: Ana, I need to figure out how to talk to my mom about the HPV vaccine. You're protected so you don't have to worry.

AT SOFIA'S HOME

Sofia [thinking] this is going to be awkward, but I need to ask my mom if she knows.

Sofia: Mamá, have I been vaccinated against HPV?

Mom: ¡Ay diosito! Why are you asking? Are you having sex? We taught you values in this house, mija.

Sofia: Mamá, why are you so difficult? This has nothing to do with sex, I want to prevent cancer!

Mom: Sofia, this vaccine is for people who have sex.

-Sofia leaves, mom calls sister

Mom: Sofia asked me about the HPV vaccine. I'm worried that this will encourage her to have sex. Are your kids vaccinated?

Sister: Miguel and Lluvia are vaccinated . The doctor told me that the vaccine is more effective before they have sex and that HPV could lead to penile or cervical cancer. I don't know what

I'd do if they had cancer!

Mom: I didn't think of it that way, I don't want Sofia to worry either.

I will talk with her when she gets back.

Sister: I will pray after I finish making picadillo.

***[Sofia and mom sitting in the house]**

Mom: Sofia, you only have one shot of the HPV vaccine. I didn't take you back because I was afraid it would encourage you to have sex. I can take you to get the vaccine tomorrow because your health is important to me.

[Sofia and mom at pharmacy]

Sofia: Hi, can you tell me about HPV and the HPV vaccine? My mom said I received one shot when I was 16 but I don't know much about it.

Pharmacist: Of course! HPV stands for the Human Papillomavirus and it can be passed from person to person through sex. Once a woman has the virus, it can cause genital warts and cervical cancer. Any signs of the virus can be detected by a pap smear test. Sofia: Can I get vaccinated?

Pharmacist: The vaccine is recommended for males and females 9-26 years old. The vaccine prevents most types of HPV. But in order to be effective, you need to get all the recommended shots. If someone receives their first shot before they are 15 years old, they only need 2 shots. Since you received your first shot after you turned 15, you need to get a total of 3 shots.

Sofia: Can I get vaccinated today and are there any side effects?

Pharmacist: Yes, you can get your second shot of the HPV vaccine today. Just make sure you come back for the third shot in four months. You may experience some mild side effects including a sore arm, fever, headache and nausea.

Sofia: Do I need to get a pap smear test first?

Pharmacist: No, but remember, the pap smear test will let you know if you have HPV or show warning signs for cervical cancer. So even if you have the vaccine, you still need to get your pap smear test.

[Sofia- fills out paperwork with mom]

Sofia gets shots

Sofia [to pharmacist] Do many people have cervical cancer?

Pharmacist: Cervical cancer is the second-most common type of cancer among women, and is caused by HPV. So make sure to come back in four months for your third shot of the vaccine.

Appendix N

Table of Cultural Cues

Type of Cultural Cue	Example (frequency of the example in the narrative)
Names	Carla (2), Kique (2), Sofia (6), Ana (1), Miguel (1), Lluvia (1)
Phrases/Language	Quince (1), Mamá (2), ¡Ay diosito! (1), mija (1)
Images	Huaraches (1), Cross (1), Virgin of Guadalupe (3)
Location	Juárez (1)
Food	Picadillo (1), Tajín (1)

Appendix O
CDC Fact Sheet

Genital HPV Infection - CDC Fact Sheet

Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States. Some health effects caused by HPV can be prevented by the HPV vaccines.

What is HPV?

HPV is the most common sexually transmitted infection (STI). HPV is a different virus than HIV and HSV (herpes). 79 million Americans, most in their late teens and early 20s, are infected with HPV. There are many different types of HPV. Some types can cause health problems including genital warts and cancers. But there is a vaccine that can stop these health problems from happening.

How is HPV spread?

You can get HPV by having vaginal, anal, or oral sex with someone who has the virus. It is most commonly spread during vaginal or anal sex. HPV can be passed even when an infected person has no signs or symptoms.

Anyone who is sexually active can get HPV, even if you have had sex with only one person. You also can develop symptoms years after you have sex with someone who is infected. This makes it hard to know when you first became infected.

Does HPV cause health problems?

In most cases, HPV goes away on its own and does not cause any health problems. But when HPV does not go away, it can cause health problems like genital warts and cancer.

Genital warts usually appear as a small bump or group of bumps in the genital area. They can be small or large, raised or flat, or shaped like a cauliflower. A healthcare provider can usually diagnose warts by looking at the genital area.

Does HPV cause cancer?

HPV can cause cervical and other cancers including cancer of the vulva, vagina, penis, or anus. It can also cause cancer in the back of the throat, including the base of the tongue and tonsils (called oropharyngeal cancer).

Cancer often takes years, even decades, to develop after a person gets HPV. The types of HPV that can cause genital warts are not the same as the types of HPV that can cause cancers.

There is no way to know which people who have HPV will develop cancer or other health problems. People with weak immune systems (including those with HIV/AIDS) may be less able to fight off HPV. They may also be more likely to develop health problems from HPV.

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
Division of STD Prevention

CS280191E

How can I avoid HPV and the health problems it can cause?

You can do several things to lower your chances of getting HPV.

Get vaccinated. The HPV vaccine is safe and effective. It can protect against diseases (including cancers) caused by HPV when given in the recommended age groups. (See "Who should get vaccinated?" below) CDC recommends 11 to 12 year olds get two doses of HPV vaccine to protect against cancers caused by HPV. For more information on the recommendations, please see: https://www.cdc.gov/vaccines/vpd/hpv/public/index.html

Get screened for cervical cancer. Routine screening for women aged 21 to 65 years old can prevent cervical cancer.

If you are sexually active

- Use latex condoms the right way every time you have sex. This can lower your chances of getting HPV. But HPV can infect areas not covered by a condom - so condoms may not fully protect against getting HPV;
- Be in a mutually monogamous relationship – or have sex only with someone who only has sex with you.

Who should get vaccinated?

All boys and girls ages 11 or 12 years should get vaccinated.

Catch-up vaccines are recommended for boys and men through age 21 and for girls and women through age 26, if they did not get vaccinated when they were younger.

The vaccine is also recommended for gay and bisexual men (or any man who has sex with a man) through age 26. It is also recommended for men and women with compromised immune systems (including those living with HIV/AIDS) through age 26, if they did not get fully vaccinated when they were younger.

How do I know if I have HPV?

There is no test to find out a person's "HPV status." Also, there is no approved HPV test to find HPV in the mouth or throat.

There are HPV tests that can be used to screen for cervical cancer. These tests are only recommended for screening in women aged 30 years and older. HPV tests are not recommended to screen men, adolescents, or women under the age of 30 years.

Most people with HPV do not know they are infected and never develop symptoms or health problems from it. Some people find out they have HPV when they get genital warts. Women may find out they have HPV when they get an abnormal Pap test result (during cervical cancer screening). Others may only find out once they've developed more serious problems from HPV, such as cancers.

How common is HPV and the health problems caused by HPV?

HPV (the virus): About 79 million Americans are currently infected with HPV. About 14 million people become newly infected each year. HPV is so common that almost every person who is sexually-active will get HPV at some time in their life if they don't get the HPV vaccine.

Health problems related to HPV include genital warts and cervical cancer.

Genital warts: Before HPV vaccines were introduced, roughly 340,000 to 360,000 women and men were affected by genital warts caused by HPV every year.* Also, about one in 100 sexually active adults in the U.S. has genital warts at any given time.

Cervical cancer: Every year, nearly 12,000 women living in the U.S. will be diagnosed with cervical cancer, and more than 4,000 women die from cervical cancer—even with screening and treatment.

There are other conditions and cancers caused by HPV that occur in people living in the United States. Every year, approximately 19,400 women and 12,100 men are affected by cancers caused by HPV.

*These figures only look at the number of people who sought care for genital warts. This could be an underestimate of the actual number of people who get genital warts.

I'm pregnant. Will having HPV affect my pregnancy?

If you are pregnant and have HPV, you can get genital warts or develop abnormal cell changes on your cervix. Abnormal cell changes can be found with routine cervical cancer screening. You should get routine cervical cancer screening even when you are pregnant.

Can I be treated for HPV or health problems caused by HPV?

There is no treatment for the virus itself. However, there are treatments for the health problems that HPV can cause:

1. **Genital warts** can be treated by your healthcare provider or with prescription medication. If left untreated, genital warts may go away, stay the same, or grow in size or number.
2. **Cervical precancer** can be treated. Women who get routine Pap tests and follow up as needed can identify problems before cancer develops. Prevention is always better than treatment. For more information visit www.cancer.org.
3. **Other HPV-related cancers** are also more treatable when diagnosed and treated early. For more information visit www.cancer.org

Where can I get more information?

HPV Topic Page
www.cdc.gov/hpv/index.html

HPV Vaccination
www.cdc.gov/vaccines/vpd/hpv/index.html

Cancer Prevention and Control
www.cdc.gov/cancer/

Cervical Cancer – What Should I Know About Screening?
www.cdc.gov/cancer/cervical/basic_info/screening.htm

CDC's National Breast and Cervical Cancer Early Detection Program
www.cdc.gov/cancer/nbccedp/

Division of STD Prevention (DSTDP)
Centers for Disease Control and Prevention
www.cdc.gov/std

CDC-INFO Contact Center
1-800-CDC-INFO
(1-800-232-4636)
wwwn.cdc.gov/dcs/ContactUs/Form

CDC National Prevention Information Network (NPIN)
npin.cdc.gov/disease/stds
P.O. Box 6003
Rockville, MD 20849-6003
E-mail: npin-info@cdc.gov

American Sexual Health Association (ASHA)
P. O. Box 13827
Research Triangle Park, NC 27709-3827
1-800-783-9877

July 2017

Appendix P

Table of HPV/HPV Vaccine Facts

HPV/HPV Vaccine Knowledge	Number of Times the survey item was mentioned	
Survey Item	Fotonovela	CDC Fact Sheet
Human papillomavirus (HPV) is a sexually transmitted infection.	1	2
Human papillomavirus (HPV) infection can go away without treatment.	1	1
Human Papillomavirus (HPV) causes genital warts.	2	6
Human Papillomavirus (HPV) causes herpes	0	0
People with Human Papillomavirus might not have any symptoms.	1	2
The Centers for Disease Control and Prevention recommends the Human Papillomavirus (HPV) vaccine for girls and boys age 11-12 years old.	1 (without referring to CDC)	2
The Human Papillomavirus (HPV) vaccine catch up doses can be administered to individuals up to age 26.	1 (pharmacist: 9-26 yo)	1
Getting regular Papanicolaou tests (also known as Pap smears, cervical screenings, or well woman's tests) reduces a woman's chances of getting cervical cancer.	1 (shows warning signs)	1(identify problems before cancer develops)
The Human Papillomavirus (HPV) can cause abnormal Papanicolaou tests (also known as Pap smears, cervical screenings, or well woman's tests).	1	1
You are in the age group that health officials recommend get the HPV vaccine.	1	1
The HPV vaccine works best if you get it before you start having sex.	1	0
The HPV vaccine prevents most cervical cancers.	1 (prevents cancer)	1 (prevents most cancers)
The HPV vaccine prevents most genital warts.	0	0
How many needle shots are required for the HPV vaccine?	1	0

Appendix Q

MPlus Syntax

```
Data:
    Format = free;
    Listwise = off;

Variable:
    Names = cond sofia1 sofia2 sofia3 trans1 trans2 trans3 trans4
    trans5 trans6 trans7 trans8 trans9 trans10 ident1 ident2 ident3
    ident5 ident7 ident9 ident11 ident13 ident15 preVKn1 preVKn2
    preVKn3 preVKn4 preVKn5 preVKn6 preVKn7 preVKn8 preVKn9
    postVKn1 postVKn2 postVKn3 postVKn4 postVKn5 postVKn6 postVKn7
    postVKn8 postVKn9 fupVKn1 fupVKn2 fupVKn3 fupVKn4 fupVKn5
    fupVKn6 fupVKn7 fupVKn8 fupVKn9 preKn1 preKn2 preKn3 preKn4
    preKn5 postKn1 postKn2 postKn3 postKn4 postKn5 fupKn1 fupKn2
    fupKn3 fupKn4 fupKn5 preSE1 preSE2 preSE3 preSE4 preSE5 preSE6
    preSE7 preSE8 postSE1 postSE2 postSE3 postSE4 postSE5 postSE6
    postSE7 postSE8 fupSE1 fupSE2 fupSE3 fupSE4 fupSE5 fupSE6 fupSE7
    fupSE8 preInt1 preInt2 preInt3 preInt4 preInt5 preInt6 preInt7
    preInt8 postInt1 postInt2 postInt3 postInt4 postInt5 postInt6
    postInt7 postInt8 fupInt1 fupInt2 fupInt3 fupInt4 fupInt5
    fupInt6 fupInt7 fupInt8;

    Usevariables = cond PS Trans Ident prKnowl poKnowl
    fuKnowl prSE poSE fuSE prInt poInt fuInt;

    Missing = all (-99);
```

Define:

```
! Perceived Similarity
PS = MEAN(sofia1-sofia3);

! Transportation (Mediator 1)
Trans = MEAN(trans1-trans10);

! Identification (Mediator 2)
Ident = MEAN(ident1-ident15);

! HPV Vaccine Knowledge: Pre, Post, and Follow-up
prKnowl = MEAN(preVKn1-preVKn9);
poKnowl = MEAN(postVKn1-postVKn9);
fuKnowl = MEAN(fupVKn1-fupVKn9);

! Self-Efficacy: Pre, Post, and Follow-up
prSE = MEAN(preSE1-preSE8);
poSE = MEAN(postSE1-postSE8);
fuSE = MEAN(fupSE1-fupSE8);

! Intention: Pre, Post, and Follow-up
prInt = MEAN(preInt1-preInt8);
poInt = MEAN(postInt1-postInt8);
fuInt = MEAN(fupInt1-fupInt8);
```

Analysis:

```
Type = General;
!Estimator = MLR;
Bootstrap = 10000;
Processors = 3;  ! Distributes the workload among 3 cores of my PC

Model:
    ! Direct Effects
    PS on cond;          !cond (0 = Mexicans | 1 = Caucasian)
    Trans Ident on cond PS;
    Ident on Trans;
    poKnowl on prKnowl cond;
    fuKnowl on poKnowl;
    poSE on prSE cond;
    fuSE on poSE;
    poInt on prInt cond;
    fuInt on poInt;
    fuKnowl on PS Trans Ident;
    fuSE on PS Trans Ident;
    fuInt on PS Trans Ident;

    ! Added paramters
    PS on prInt;
    poSE ON prInt;
    fuSE ON poInt;
    trans ident on prInt;
    fuKnowl on poInt;
```

! Bidirectional effects

cond with prKnowl prSE prInt;

prKnowl with prSE prInt;

prSE with prInt;

PS with poKnowl poSE poInt;

Trans with poKnowl poSE poInt;

Ident with poKnowl poSE poInt;

poKnowl with poSE poInt;

poSE with poInt;

fuKnowl with fuSE fuInt;

fuSE with fuInt;

! Variances at 1st time point

cond; prKnowl; prSE; prInt;

!Indirect Effects

Model Indirect:

fuKnowl via Trans PS cond;

fuSE via Trans PS cond;

fuInt via Trans PS cond;

fuKnowl via Ident PS cond;

fuSE via Ident PS cond;

fuInt via Ident PS cond;

fuKnowl via poInt cond;

fuSE via poInt cond;

fuInt via poInt cond;

Output:

stand;

cint (bcbootstrap);

Table 1. *Demographics by Condition*

Variable	*Mexican American Fotonovela (N = 60)*	*Mexican-American CDC fact sheet (N = 53)*	*Non-Latina White Fotonovela (N = 41)*
Age in Years	*M* = 19.95 (*SD* = 2.22)	*M* = 19.38 (*SD* = 1.55)	*M* = 20.12 (*SD* = 2.41)
Health Insurance			
Yes	41 (68.3%)	30 (65.2%)	30 (73.2%)
No	14 (23.3%)	11 (23.9%)	9 (22.0%)
Don't Know	5 (8.3%)	5 (10.9%)	2 (4.9%)
Primary Health Care Provider			
Yes	42 (70.0%)	32 (60.4%)	25 (61.0%)
No	14 (23.3%)	16 (30.2%)	11 (26.8%)
Don't Know	4 (6.7%)	5 (9.4%)	5 (12.2%)
HPV vaccine receipt			
Yes	22 (36.7%)	21 (39.6%)	14 (34.1%)
No	21 (35.0%)	19 (35.8%)	17 (41.5%)
Don't Know	17 (28.3%)	13 (24.5%)	10 (24.4%)
HPV vaccine Doses			
0	18 (30.0%)	18 (34.0%)	16 (39.0%)
1	12 (20.0%)	8 (15.1%)	13 (31.7%)
2	5 (8.3%)	5 (9.4%)	3 (7.3%)
Don't Know	25 (41.7%)	19 (35.8%)	9 (22.0%)
Pap Smear Test			
Yes	15 (25.0%)	10 (18.9%)	14 (34.1%)
No	43 (71.7%)	40 (75.5%)	25 (61.0%)
Don't Know	2 (3.3%)	3 (5.7%)	2 (4.9%)
Ever had sex			
Yes	37 (61.7%)	37 (69.8%)	29 (70.7%)
No	23 (38.3)	16 (30.2%)	11 (26.8%)
Don't Know	0 (0%)	0 (0%)	1 (2.4%)

Table 2. Pre-test Ethnic Differences

	n	*M*	*SD*	*F-test*
HPV Knowledge				F (1,152) = 5.58, p = .019
Mexican-Americans	113	1.79	1.22	
Non-Latina Whites	41	2.32	1.25	
HPV Vaccine Knowledge				F (1,152) = 1.53, p = .218
Mexican-Americans	113	4.11	2.30	
Non-Latina Whites	41	4.63	2.47	
Self-Efficacy				F (1,152) = .89, p = .348
Mexican-Americans	113	3.47	.93	
Non-Latina Whites	41	3.32	.84	
Intention				F (1,152) = 3.23, p = .074
Mexican-Americans	113	1.15	.11	
Non-Latina Whites	41	4.16	.18	

Table 3. *Descriptive Statistics and Internal Reliability*

	# of items	*n*	*M*	*SD*	α
Perceived Similarity	3	108	2.71	0.99	0.97
Transportation	10	108	2.57	0.57	0.69
Identification	9	108	3.32	0.75	0.91
HPV Knowledge					
Pre-test	5	161	1.96	1.24	0.61
Immediate post-test	5	161	3.61	.92	0.48
One week follow-up	5	120	.86	.81	0.64
HPV Vaccine Knowledge					
Pre-test	9	161	4.24	2.35	0.71
Immediate post-test	9	161	7.55	1.81	0.77
One week follow-up	9	120	1.34	1.13	0.84
Self-Efficacy					
Pre-test	8	161	3.42	0.89	0.81
Immediate post-test	8	161	3.75	0.91	0.87
One week follow-up	8	120	3.62	0.91	0.89
Intention					
Pre-test	8	161	4.43	1.14	0.87
Immediate post-test	8	161	5.09	1.28	0.92
One week follow-up	8	120	4.90	1.41	0.92

¶

Table 4. *Perceived Similarity: Item summary of intercorrelations*

Items	*M*	*SD*	1	2	3
Item 1	2.92	1.08	1	-	-
Item 2	2.82	1.13	0.91**	1	-
Item 3	2.80	1.13	0.92**	0.94**	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. *Transportation: Item summary of intercorrelations*

Items	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
Item 1	1.95	1.14	1	-	-	-	-	-	-	-	-	-
Item 2	2.98	1.17	0.06	1	-	-	-	-	-	-	-	-
Item 3	3.52	1.16	-0.19	0.81	1	-	-	-	-	-	-	-
Item 4	2.60	1.14	0.17	-0.17	-0.27	1	-	-	-	-	-	-
Item 5	3.42	1.28	-0.07	0.64	0.61	-0.07	1	-	-	-	-	-
Item 6	2.03	1.10	-0.08	0.63	0.53	0.01	0.53	1	-	-	-	-
Item 7	2.77	1.21	.08	0.50	0.43	0.04	0.61	0.45	1	-	-	-
Item 8	1.70	0.89	0.37	-0.17	-0.28	0.37	-0.20	-0.11	-0.00	1	-	-
Item 9	2.08	1.08	-.07	0.57	0.48	-0.06	0.47	0.68	0.33	-0.12	1	-
Item 10	2.45	1.19	-0.16	0.57	0.53	-0.00	0.48	0.55	0.23	-0.24	0.50	1

Table 6. *Identification: Item summary of intercorrelations*

Items	*M*	*SD*	1	2	3	4	5	6	7	8	9
Item 1	2.82	1.14	1	-	-	-	-	-	-	-	-
Item 2	2.83	1.14	0.71	1	-	-	-	-	-	-	-
Item 3	3.70	0.87	0.68	0.46	1	-	-	-	-	-	-
Item 5	3.70	0.81	0.60	0.37	0.76	1	-	-	-	-	-
Item 7	3.63	0.88	0.47	0.45	0.50	0.70	1	-	-	-	-
Item 9	3.45	0.96	0.63	0.44	0.55	0.70	0.60	1	-	-	-
Item 11	3.17	1.12	0.70	0.53	0.57	0.64	0.54	0.70	1	-	-
Item 13	3.17	1.03	0.68	0.47	0.65	0.65	0.48	0.59	0.71	1	-
Item 15	3.85	1.09	0.62	0.45	0.60	0.74	0.67	0.71	0.63	0.65	1

Table 7. *Self-Efficacy: Item summary of intercorrelations between pre-test, immediate post-test and one week follow-up assessments*

Items	*M*	*SD*	1	2	3	4	5	6	7	8
Pre-test										
Item 1	3.72	1.34	1	-	-	-	-	-	-	-
Item 2	3.15	1.29	0.62	1	-	-	-	-	-	-
Item 3	3.75	1.17	0.34	0.36	1	-	-	-	-	-
Item 4	4.28	0.99	0.56	0.51	0.63	1	-	-	-	-
Item 5	4.37	0.96	0.15	0.26	0.43	0.39	1	-	-	-
Item 6	3.50	1.24	0.37	0.38	0.51	0.47	0.37	1	-	-
Item 7	2.95	1.42	0.33	0.32	0.31	0.23	0.29	0.57	1	-
Item 8	3.33	1.23	0.34	0.42	0.41	0.27	0.34	0.55	0.80	1
Post-test										
Item 1	4.08	1.03	1	-	-	-	-	-	-	-
Item 2	3.70	1.20	0.57	1	-	-	-	-	-	-
Item 3	3.95	1.02	0.38	0.53	1	-	-	-	-	-
Item 4	4.47	0.77	0.57	0.56	0.64	1	-	-	-	-
Item 5	4.38	0.74	0.45	0.40	0.48	0.66	1	-	-	-
Item 6	4.05	1.00	0.56	0.64	0.75	0.72	0.64	1	-	-
Item 7	3.47	1.36	0.47	0.57	0.47	0.40	0.34	0.53	1	-
Item 8	3.90	1.05	0.48	0.61	0.50	0.28	0.33	0.57	0.86	1
One week follow-up										
Item 1	3.88	1.15	1	-	-	-	-	-	-	-
Item 2	3.76	1.05	0.80	1	-	-	-	-	-	-
Item 3	4.06	0.94	0.39	0.56	1	-	-	-	-	-
Item 4	4.43	0.76	0.44	0.50	0.60	1	-	-	-	-
Item 5	4.20	0.82	0.34	0.38	0.50	0.53	1	-	-	-
Item 6	4.00	0.96	0.34	0.46	0.65	0.60	0.56	1	-	-
Item 7	3.04	1.37	0.45	0.50	0.37	0.36	0.59	0.60	1	-
Item 8	3.49	1.24	0.42	0.52	0.52	0.41	0.62	0.68	0.83	1

Table 8. *Intentions: Item summary of intercorrelations between pre-test, immediate post-test and one week follow-up assessments*

Items	*M*	*SD*	1	2	3	4	5	6	7	8
Pre-test										
Item 1	4.75	1.60	1	-	-	-	-	-	-	-
Item 2	4.03	1.50	0.68	1	-	-	-	-	-	-
Item 3	4.23	1.43	0.42	0.55	1	-	-	-	-	-
Item 4	5.00	1.52	0.70	0.69	0.50	1	-	-	-	-
Item 5	5.42	1.24	0.55	0.47	0.33	0.61	1	-	-	-
Item 6	4.28	1.37	0.59	0.60	0.47	0.67	0.47	1	-	-
Item 7	3.92	1.65	0.58	0.64	0.37	0.56	0.45	0.67	1	-
Item 8	4.62	1.37	0.56	0.51	0.37	0.58	0.49	0.64	0.82	1
Post-test										
Item 1	5.60	1.39	1	-	-	-	-	-	-	-
Item 2	5.03	1.66	0.67	1	-	-	-	-	-	-
Item 3	5.47	1.30	0.66	0.73	1	-	-	-	-	-
Item 4	5.97	1.13	0.70	0.59	0.74	1	-	-	-	-
Item 5	6.03	1.19	0.62	0.46	0.67	0.70	1	-	-	-
Item 6	5.45	1.36	0.55	0.64	0.88	0.74	0.60	1	-	-
Item 7	4.88	1.80	0.63	0.63	0.64	0.66	0.60	0.64	1	-
Item 8	5.48	1.42	0.55	0.56	0.61	0.71	0.61	0.68	0.74	1
One week follow-up										
Item 1	5.22	1.65	1	-	-	-	-	-	-	-
Item 2	4.73	1.81	0.81	1	-	-	-	-	-	-
Item 3	5.29	1.61	0.39	0.66	1	-	-	-	-	-
Item 4	5.61	1.53	0.55	0.49	0.62	1	-	-	-	-
Item 5	5.55	1.47	0.75	0.70	0.67	0.78	1	-	-	-
Item 6	5.37	1.38	0.53	0.64	0.74	0.70	0.75	1	-	-
Item 7	4.47	1.96	0.48	0.56	0.64	0.60	0.65	0.71	1	-
Item 8	5.10	1.61	0.49	0.54	0.63	0.60	0.63	0.73	0.77	1

Table 9. Descriptive Statistics for HPV Knowledge

		Pre-Test		Immediate Post-Test		One week Follow-up	
	n	*M*	*SD*	*M*	*SD*	*M*	*SD*
Mexican-Americans fotonovela	49	1.55	1.14	3.76	0.43	0.88	0.78
Non-Latina Whites fotonovela	27	2.33	1.21	3.56	1.09	0.78	0.80
Mexican-Americans CDC	40	1.90	1.15	3.58	1.24	0.90	0.90

Table 10. Descriptive Statistics for HPV Vaccine Knowledge

		Pre-Test		Immediate Post-Test		One week Follow-up	
	n	*M*	*SD*	*M*	*SD*	*M*	*SD*
Mexican-Americans fotonovela	49	4.04	2.04	8.08	1.10	1.24	1.13
Non-Latina Whites fotonovela	27	4.44	2.45	7.67	2.02	1.26	0.90
Mexican-Americans CDC	40	4.05	2.30	6.60	2.15	1.60	1.26

Table 11. Descriptive Statistics for Self-Efficacy

		Pre-Test		Immediate Post-Test		One week Follow-up	
	n	*M*	*SD*	*M*	*SD*	*M*	*SD*
Mexican-Americans fotonovela	49	3.66	0.81	4.02	0.79	3.86	0.79
Non-Latina Whites fotonovela	27	3.49	0.77	3.51	0.98	3.46	0.85
Mexican-Americans CDC	40	3.40	0.98	3.58	1.04	3.46	1.04

Table 12. Descriptive Statistics for Intention

		Pre-Test		Immediate Post-Test		One week Follow-up	
	n	*M*	*SD*	*M*	*SD*	*M*	*SD*
Mexican-Americans fotonovela	49	4.64	1.23	5.53	1.20	5.17	1.34
Non-Latina Whites fotonovela	27	4.20	1.19	4.56	1.42	4.52	1.24
Mexican-Americans CDC	40	4.59	1.27	5.02	1.33	4.83	1.52

Table 13. *Summary of Standardized Indirect Effects on Knowledge, Self-Efficacy and Intention*

					Bias-Corrected CIs	
	β	S.E.	Est./S.E.	*p*-value	UL	LL
Follow-Up HPV Vaccine Knowledge						
COND -> PS -> TRANS -> KNOW3	-0.008	0.011	-0.723	0.470	-0.036	0.020
COND -> PS -> TRANS -> IDENT -> KNOW3	0.006	0.007	0.844	0.399	-0.012	0.025
Total Indirect Effect	-0.002	0.006	-0.288	0.774	-0.018	0.014
COND -> PS -> IDENT -> KNOW3	0.012	0.014	0.829	0.407	-0.025	0.049
COND -> PS -> TRANS -> IDENT -> KNOW3	0.006	0.007	0.844	0.399	-0.012	0.025
Total Indirect Effect	0.018	0.020	0.890	0.374	-0.034	0.070
COND -> INT2 -> KNOW3	-0.042	0.028	-1.476	0.140	-0.115	0.031
Follow-Up Self-Efficacy						
COND -> PS -> TRANS -> SE3	-0.004	0.005	-0.748	0.454	-0.017	0.009
COND -> PS -> TRANS -> IDENT -> SE3	-0.001	0.003	-0.216	0.829	-0.008	0.007
Total Indirect Effect	-0.004	0.005	-0.794	0.427	-0.018	0.010
COND -> PS -> IDENT -> SE3	-0.001	0.006	-0.209	0.835	-0.016	0.014
COND -> PS -> TRANS -> IDENT -> SE3	-0.001	0.003	-0.216	0.829	-0.008	0.007
Total Indirect Effect	-0.002	0.008	-0.220	0.826	-0.023	0.019
COND -> INT2 -> SE3	-0.120	0.050	-2.379	0.017	-0.249	0.010
Follow-Up Intention						
COND -> PS -> TRANS -> INT3	-0.005	0.006	-0.869	0.385	-0.022	0.011
COND -> PS -> TRANS -> IDENT -> INT3	0.001	0.002	0.244	0.807	-0.006	0.007
Total Indirect Effect	-0.005	0.005	-0.910	0.363	-0.019	0.009
COND -> PS -> IDENT -> INT3	0.001	0.005	0.249	0.803	-0.011	0.013
COND -> PS -> TRANS -> IDENT -> INT3	0.001	0.002	0.244	0.807	-0.006	0.007
Total Indirect Effect	0.002	0.007	0.256	0.798	-0.016	0.019
COND -> INT2 -> INT3	-0.143	0.046	-3.069	0.002	-0.262	-0.023

CI = Confidence intervals at the 95% level; COND = Condition; PS = Perceived Similarity; TRANS = Transportation; IDENT = Identification; KNOW1 = pre-test HPV Vaccine Knowledge; KNOW2 = post-test HPV Vaccine Knowledge; KNOW3 = follow-up HPV Vaccine Knowledge; SE1 = pre-test Self-Efficacy; SE2 = post-test Self-Efficacy; SE3 = follow-up Self-Efficacy; INT1 = pre-test Intention; INT2 = post-test Intention; INT3 = follow-up Intention

Table 14. *Summary of Direct Effects*

	β	S.E.	β*	Est./S.E.	*p*-value	CIs LL	CIs UL
Perceived Similarity							
COND -> PS	-0.226	0.189	-0.111	-1.196	0.232	-0.720	0.255
INT1 -> PS	0.288	0.080	0.327	3.613	0.000	0.083	0.500
Transportation							
COND -> TRANS	0.156	0.108	0.131	1.441	0.150	-0.119	0.440
PS -> TRANS	0.164	0.055	0.281	2.964	0.003	0.030	0.321
INT1 -> TRANS	0.139	0.048	0.271	2.872	0.004	0.017	0.270
Identification							
COND -> IDENT	-0.102	0.128	-0.063	-0.800	0.424	-0.439	0.215
PS -> IDENT	0.205	0.079	0.256	2.603	0.009	0.023	0.437
INT1 -> IDENT	0.123	0.050	0.175	2.478	0.013	-0.006	0.259
TRANS -> IDENT	0.633	0.128	0.463	4.953	0.000	0.278	0.942
Post-Test HPV Vaccine Knowledge							
KNOW1 -> KNOW2	0.186	0.072	0.296	2.575	0.010	0.005	0.373
COND -> KNOW2	-0.046	0.036	-0.137	-1.287	0.198	-0.149	0.037
Follow-Up HPV Vaccine Knowledge							
KNOW2 -> KNOW3	0.121	0.131	0.171	0.925	0.355	-0.212	0.446
PS -> KNOW3	-0.016	0.019	-0.135	-0.828	0.407	-0.072	0.028
TRANS -> KNOW3	0.050	0.032	0.251	1.577	0.115	-0.043	0.131
IDENT -> KNOW3	-0.062	0.030	-0.420	-2.052	0.040	-0.138	0.025
INT2 -> KNOW3	0.018	0.012	0.198	1.500	0.134	-0.012	0.050
Post-Test Self-Efficacy							
SE1 -> SE2	0.585	0.116	0.546	5.039	0.000	0.309	0.866
COND -> SE2	-0.191	0.138	-0.104	-1.384	0.167	-0.557	0.158
INT1 -> SE2	0.207	0.074	0.260	2.778	0.005	0.016	0.397
Follow-Up Self-Efficacy							
SE2 -> SE3	0.055	0.158	0.061	0.350	0.727	-0.163	0.551
PS -> SE3	-0.019	0.088	-0.023	-0.214	0.831	-0.243	0.212
TRANS -> SE3	0.167	0.116	0.120	1.438	0.150	-0.127	0.495
IDENT -> SE3	0.043	0.147	0.042	0.293	0.769	-0.323	0.472
INT2 -> SE3	0.352	0.106	0.565	3.311	0.001	0.073	0.591
Post-Test Intention							
INT1 -> INT2	0.863	0.063	0.751	13.691	0.000	0.700	1.035
COND -> INT2	-0.564	0.165	-0.211	-3.424	0.001	-0.990	-0.151
Follow-Up Intention							
INT2 -> INT3	0.670	0.109	0.674	6.120	0.000	0.377	0.958
PS -> INT3	0.065	0.095	0.050	0.686	0.493	-0.174	0.336
TRANS -> INT3	0.390	0.176	0.176	2.221	0.026	-0.050	0.892

IDENT -> INT3	-0.065	0.183	-0.040	-0.357	0.721	-0.612	0.349

CI = Confidence intervals at the 95% level; COND = Condition; PS = Perceived Similarity; TRANS = Transportation; IDENT = Identification; KNOW1 = pre-test HPV Vaccine Knowledge; KNOW2 = post-test HPV Vaccine Knowledge; KNOW3 = follow-up HPV Vaccine Knowledge; SE1 = pre-test Self-Efficacy; SE2 = post-test Self-Efficacy; SE3 = follow-up Self-Efficacy; INT1 = pre-test Intention; INT2 = post-test Intention; INT3 = follow-up Intention

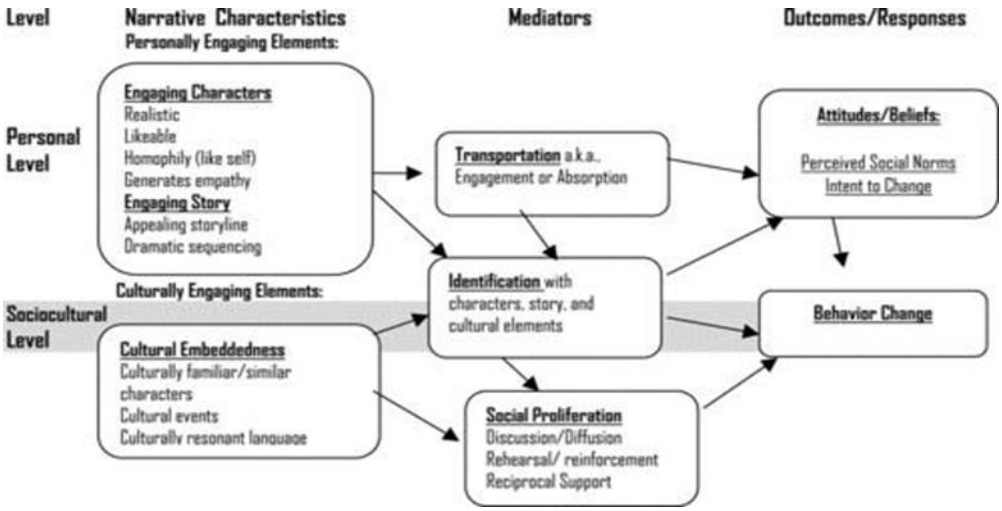

Figure 1. *Culture-Centric Model of Health Communication*

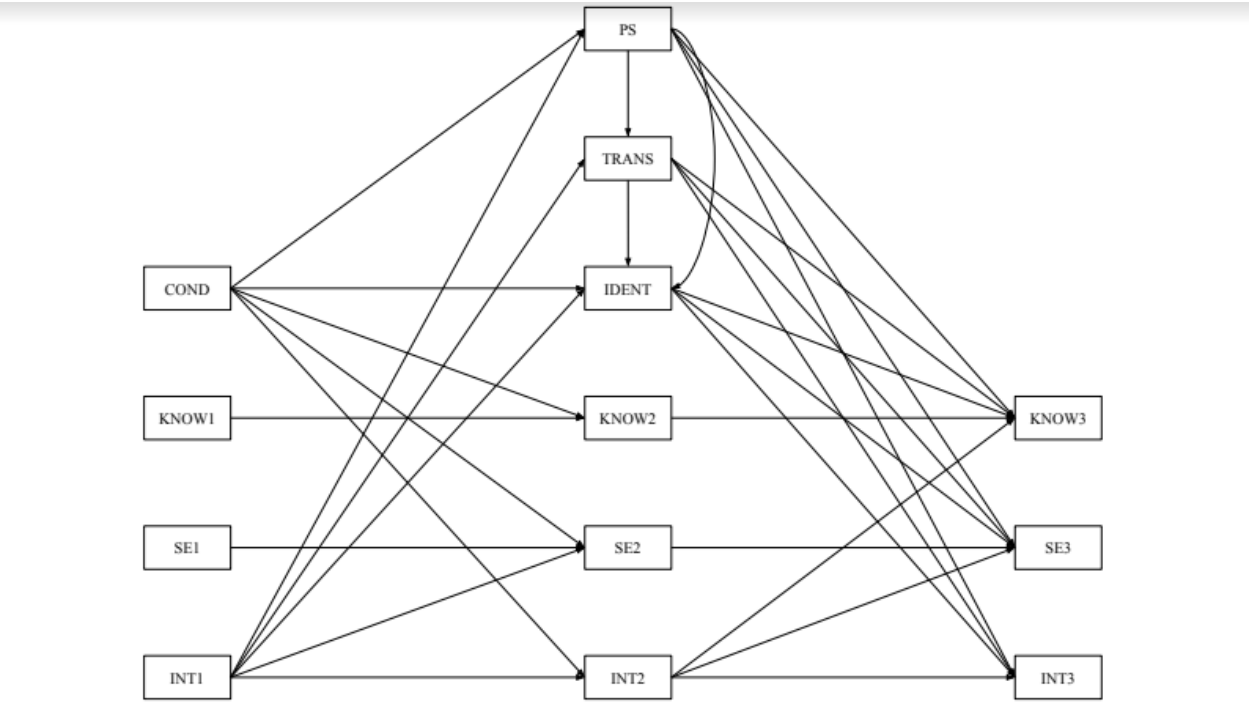

Figure 2. *Hypothesized Model*

COND = Condition, PS = Perceived Similarity, TRANS = Transportation, IDENT = Identification, KNO = Knowledge of HPV Vaccine, SE = Self-Efficacy, INT = Intention to Vaccinate; estimates are standardized.

Note: pre-test and immediate post-test outcomes are controlled for in the model.

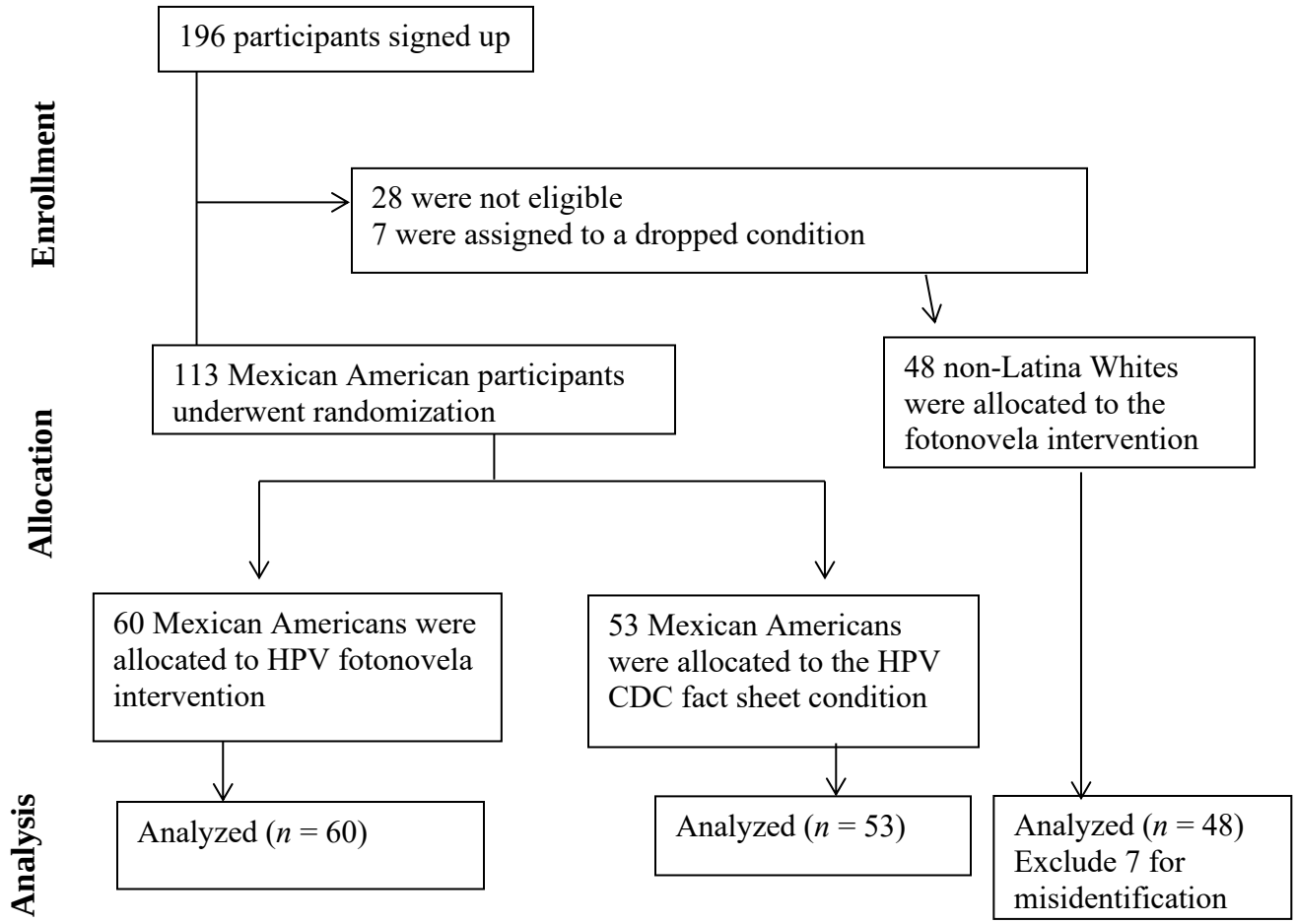

Figure 3. *Diagram of Excluded Participants*

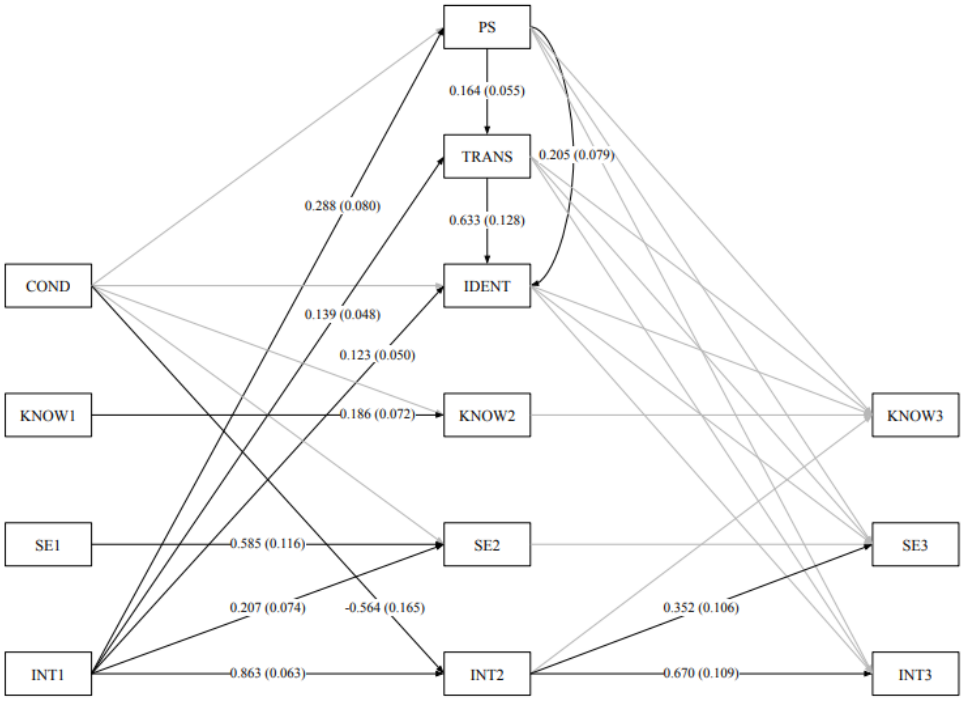

Figure 4. *Effect of Perceived Similarity on Knowledge, Self-Efficacy and Intentions via Transportation and Identification*

COND = Condition, PS = Perceived Similarity, TRANS = Transportation, IDENT = Identification, KNO = Knowledge of HPV Vaccine, SE = Self-Efficacy, INT = Intention to Vaccinate; estimates are standardized; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: pre-test and immediate post-test outcomes are controlled for in the model.

Vita

Erica Landrau completed her master's degree in Clinical Psychology at the University of Texas at El Paso in 2018.

This thesis was typed by Erica Landrau.