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## A Qualitative Analysis of the Vaccine Intention-Behavior Relationship: Parents' Descriptions of their Intentions, Decision-making Behavior, and Planning Processes toward HPV Vaccination

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### Abstract

**Objective:** Identify factors influencing the vaccine intention-behavior relationship.

**Design:** 445 parents who received a brief intervention to promote HPV vaccination were categorized based on their intentions post-intervention (yes/unsure/eventually/never) and subsequent adolescents' vaccine status (yes/no). 51 of those parents participated in qualitative interviews.

**Main Outcome Measures:** Parents described their intentions, decision-making, and planning processes toward vaccination. Framework analysis was used to analyze the data.

**Results:** Parents in the "Yes/Yes" category were knowledgeable about HPV/vaccine, described strong, stable intentions, considered themselves the primary decision-makers about vaccination, and said they vaccinated immediately. "Yes/No" parents described strong intentions and thought their adolescent was vaccinated OR described hesitant intentions, seeking advice/agreement from others and noting barriers to vaccination without solutions. "Unsure/Yes" parents described their intentions as strengthening with information from credible sources and identified strategies for

overcoming barriers. “Unsure/No” and “Eventually/No” parents had misinformation/negative beliefs regarding vaccination, described being ambivalent or non-supportive of vaccination, and cited barriers to vaccination. “Never/No” parents held negative beliefs about vaccination, described strong, stable intentions to NOT vaccinate, deferring the decision to others, and reported no planning toward vaccination.

**Conclusions:** Intention characteristics and planning processes could moderate the vaccine intention-behavior relationship, potentially serving as targets for future vaccine strategies.

### Keywords

Human papillomavirus; HPV vaccination; vaccine acceptance; parent vaccine decision-making; intention-behavior relationship; ambivalence

### Introduction

Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States (Centers for Disease Control and Prevention, 2012). Based on data from the National Health and Nutrition Examination Survey (NHANES) data from 2007–2010, 41.9% of US women ages 18 to 59 years were infected with genital HPV (Shi, Devarakonda, Liu, Taylor, & Mills, 2014). HPV is the necessary cause of virtually all cervical cancers and genital warts, many anal cancers, as well as vaginal, vulvar, penile, and head and neck cancers (De Vuyst, Clifford, Nascimento, Madeleine, & Franceschi, 2009; Gillison, 2008; Lacey, Lowndes, & Shah; Parkin, 2006; Tota, Chevarie-Davis, Richardson, Devries, & Franco, 2011). The incidence of cervical cancer in Texas is particularly high at 8.7 per 100,000 persons, the fourth highest rate among the states in the US. Approximately 4,000 women die from cervical cancer each year in the US as a result of HPV infection (U.S. Cancer Statistics Working Group, 2016).

The quadrivalent (4vHPV) and nonavalent (9vHPV) vaccines protect against cervical and anal cancer as well as genital warts (Food and Drug Administration, 2009a, 2009b). The Advisory Committee on Immunization Practices (ACIP) recommends routine HPV vaccination for males and females ages 11 and 12 years and catch up vaccination for females ages 13 through 26 years and males ages 13 to 21 years (Centers for Disease Control and Prevention, 2007, 2011). Rates of HPV vaccine uptake have been lower than expected, thus limiting the vaccine’s ability to maximize its effects on the disease burden. In fact, according to the 2015 National Immunization Survey, only 63% of adolescent girls and 50% of boys ages 13 to 17 years had received their first dose of the HPV vaccine, and 40% of girls and 22% of boys had received all three doses. Rates for girls and boys in Texas are lower than these national rates (Reagan-Steiner, Yankey, Jeyarajah, et al, 2016) and much lower than the Healthy People 2020 immunization goal of 80% series completion for the HPV vaccine among females.

Two theories that often have been utilized in the HPV literature to help elucidate factors contributing to the low HPV vaccination rate are the Health Belief Model (HBM) (Rosenstock et al., 1988) and Theory of Planned Behavior (TPB) (Ajzen, 1991; Fishbein & Ajzen, 1975). HBM (Rosenstock et al., 1988) posits that five constructs influence whether a

person engages in a desired health behavior. In the case of HPV vaccination, these constructs include: perceived susceptibility of HPV, perceived severity of HPV, perceived benefits to or advantages of engaging in HPV vaccination, perceived barriers to enacting HPV vaccination, and cues to act or engage in HPV vaccination (e.g., provider recommendation). TPB (Ajzen, 1991; Fishbein & Ajzen, 1975) proposes that attitudes (i.e., risk-benefit analysis of enacting the behavior) and subjective norms (i.e., beliefs about whether significant others are supportive of the behavior) influence an individual's intentions to engage in a specified health behavior, which in turn influence the likelihood of engaging in that behavior (e.g., HPV vaccination). TPB also suggests that a person's belief about their control over that behavior can directly influence the enactment of that health behavior (e.g., HPV vaccination), either directly or indirectly through its influence on intentions.

While only TPB specifically defines "intentions" as a proximal determinate of HPV vaccination, others have suggested that HBM's constructs (e.g., perceived severity of illness) likely influence health behavior through their impact on intentions. Prior research within the HPV vaccine literature has lent support to this notion (Cunningham-Erves, Talbott, O'Neal, Ivankova, & Wallston, 2015; Priest, Knowlden, & Sharma, 2015; Wang, Chou, Ma, & Hsu, 2016; Wilson et al., 2016). With these 2 theories in mind, intervention strategies have aimed to modify parents' health beliefs/attitudes toward vaccination (e.g., parental perceived risk of infection) (Cox, Cox, Sturm, & Zimet, 2010; Gerend & Shepherd, 2007) with the hope that doing so would increase parental intentions toward vaccination and ultimately parental initiation of vaccination. Yet, studies have consistently found that parental intentions to vaccinate are much higher (range of 75–96%) (Davis, Dickman, Ferris, & Dias, 2004; Jaspers, Budiningsih, Wolterbeek, Henderson, & Peters, 2011; Zimet, 2006) than the actual rates of vaccine initiation and completion. Further, in studies that have recorded intentions to vaccinate and then later examined rates of vaccination, only 38–57% of parents with intentions to vaccinate have followed through and initiated HPV vaccination (Brewer et al., 2011; Rickert et al., 2015a).

Little is known about what contributes to this gap between intentions and behavior. Much of the prior research on HPV vaccination has focused on assessing the relationship between various health beliefs and intentions to vaccinate (Cunningham-Erves et al., 2015; Priest et al., 2015; Wang et al., 2016; Wilson et al., 2016), while less has been devoted to determining the relevant factors influencing the vaccine intention-behavior relationship. Yet, to develop effective strategies to promote HPV vaccination, both areas of research are needed. With the current study, we aimed to develop a greater understanding of parental vaccine intentions while also identifying potential reasons for the gap (personal and/or contextual) between vaccine intentions and behavior. Given the limited amount of information available, qualitative methodology versus quantitative methodology was determined to be a better fit for our purpose of gaining new insight into this area.

Based on health behavior models including TPB, we decided to explore 3 areas. First, according to TPB, **characteristics of the intention construct** could influence the consistency between intentions and behavior. That is, intentions must remain strong and stable long enough in order for one to complete the desired behavior. Even when an individual's intentions are stable and strong, extensions of the TPB model often referred to

as action-based models (Gollwitzer, 1993; Schwarzer, 2008; Sheeran, Webb, & Gollwitzer, 2005) propose that key **planning processes** (e.g., designating where, when, and how carry to out the behavior; developing solutions for overcoming anticipated barriers) must be activated for intentions to be fulfilled. Action-based theories, thus, propose that there are both pre-intentional motivation processes (e.g., attitudes) as well as post-intentional volition processes (e.g., planning). When intentions are unstable or ambivalent, the Model of Ambivalence-Induced Discomfort (MAID) (van Harreveld, van der Pligt, & de Liver, 2009) suggests that an individual's **coping response to that instability** (e.g., seeking out health information, avoidance, deference of decision to others) can influence whether the health behavior is enacted.

We previously published a paper that examined the effects of a brief message intervention on HPV vaccination at a school-based health center (SBHC) (Rickert et al., 2015a). In that prior study, we obtained a categorical assessment of parental intentions to vaccinate and gave parents the opportunity to vaccinate their adolescent at the SBHC. Here, we summarize findings from qualitative interviews that were conducted after the intervention to help us 1) understand and identify reasons for the gap between vaccine intentions and behavior and 2) gain greater insight into potential factors influencing the relationship between intentions and behavior.

## Methods

### Recruitment and Procedure

In a larger study (Rickert et al., 2015b), 445 parents of adolescents who had not yet received the HPV vaccine (ages 11 to 15 years) were recruited from a school-based health center (SBHC) that provides free health care services to Galveston County, Texas residents ages 21 and under. For that study, parents participated in phone interviews during which they were randomly assigned to receive two, two-level interventions using a 2 X 2 design (rhetorical question (RQ) or no RQ, one-sided message or two-sided message). Messages were modified slightly based on the adolescent's gender and translated into Spanish for Spanish-speaking parents. In the prior study, RQ had a main effect on intentions but not behavior. See below for the specific messages given:

#### RQ:

Do you want to protect your son from getting genital warts? Yes or no. If there was a vaccine that could prevent genital warts, would you have your son get it? Yes or no.

#### One-sided message:

The HPV vaccine, which you may know as Gardasil, is an effective way to protect your son from genital warts and most types of anal cancer. This vaccine has been licensed for 5 years and over 72 million doses worldwide have been given to adolescent girls and boys as well as young adult women and men. It has been found to be very safe.

**Two-sided message:**

The HPV vaccine, which you may know as Gardasil, is an effective way to protect your son from genital warts and most types of anal cancer: Some parents want to wait until more adolescent boys have been given this vaccine before getting their own son vaccinated. However, this vaccine has been licensed for 5 years and over 72 million doses worldwide have been given to adolescent girls and boys as well as young adult women and men. It has been found to be very safe.

Parental vaccine intentions prior to receiving the brief message were NOT recorded. At the end of the phone interview, parents were asked to note their intentions to vaccinate at the SBHC in the next month (e.g., *yes; no-I don't intend to get my son/daughter vaccinated at all; unsure; no-but I will eventually get him/her vaccinated; no, but I will get my son/daughter vaccinated at the university-based clinic*). With the exception of those who indicated that they had no intention of vaccinating, parents were sent a vaccine information sheet and HPV consent form in the mail with a self-addressed stamped envelope. Adolescents whose parents returned the consent form were either pulled from class and administered the vaccine or given an appointment to get the vaccine. Medical records at the SBHC and university-based clinic were reviewed to determine if the adolescent was vaccinated post the brief message intervention.

For the present study, each parent was first placed into an intention-behavior category based on 1) his/her response to the intention question in the previous, larger study (i.e., yes/no/unsure/eventually/university-based) and 2) his/her adolescent's vaccination status (i.e., yes/no) post the brief message phone intervention. Given the small numbers of eligible participants in the Eventually/Yes, University-based/Yes, University-based/No categories, we did not include parents from those categories. There were a total of 97 parents in the Yes/Yes category, 68 in the Yes/No category, 28 in the Unsure/Yes category, 157 in the Unsure/no category, 32 in the Eventually/No, and 27 in the Never/No category (see Table 1). Prior to contacting eligible parents, adolescents' HPV vaccine status was confirmed using electronic medical records at the SBHC and the university-based clinic associated with the SBHC. Eligible parents were sent letters describing the study and then recruited over the phone. Phone numbers collected from the initial study were used to contact eligible participants. When these original numbers were deemed non-working, research staff updated parent contact information by reviewing electronic medical records. Multiple call attempts (on average 3 attempts) were made to contact eligible participants. When phone contact was made, the research staff described the study and asked the parent to participate in a one-hour face-to-face qualitative interview. For those parents who agreed to participate, a date, time, and parent's preferred location (e.g., clinic, parent home) were scheduled for the interview. Attempts were made to contact parents who did not show for the appointment. Written informed consent was obtained from each parent at the time of the interview prior to participation. Parents were reimbursed with a \$50 gift card for their time and effort. All interviews were conducted in English, digitally audio-recorded with field notes taken at the time of the interview. The recorded interviews were then transcribed by a professional transcription service. All procedures for the study were approved by the IRB at the University of Texas Medical Branch at Galveston.

## Measures

The qualitative interview assessed parent and adolescent demographics, parent knowledge HPV vaccination, stability and strength of HPV vaccine intentions, and parent approach to planning and organization of HPV vaccination. Primary questions were followed up by probes aimed at eliciting more detailed information. **Parent and adolescent demographics** included parent and adolescent age, living situation, and marital status (race-ethnicity and gender were previously recorded from the larger study). **Knowledge of HPV vaccination** was assessed by asking parents: *Please tell me what you understand about the HPV vaccine. What is it for?* **Stability of Intention** was assessed with multiple questions: *Since the phone interview, would you say that your decision (intention) about getting your son/daughter the HPV vaccine has stayed the same, changed a little, or changed a lot?; Tell me more about what has made it stay the same, change a little, or change a lot; If it has changed, please tell me how it has changed; If it has changed, what led to those changes?* **Strength of Intention/Importance of Vaccination** was assessed by asking parents to rate the degree of importance they placed on HPV vaccination at the time of the initial interview and currently. They were then asked to describe the rationale behind the current degree of importance. **Approach to planning and organization with regard to HPV vaccination** were assessed via instructions that included normalization for the range of responses they might provide to describe their planning, use of systems, attention to detail, time to task completion, and affect in relation to their HPV vaccine decision (e.g., *Some parents may have returned the form right away and others tended to put off sending the form*). A series of questions and follow-up probes were asked to elicit information in these specific areas (e.g., *Tell us what you remember about what you did when you received the form. How much would you say you planned out this task (vaccination)? How much would you say you used systems to help you complete the task? What made it hard or easy to get your adolescent the HPV vaccine? If there were obstacles, how did you overcome those obstacles?*). Questions were slightly modified to make them appropriate for parents from each intention/behavior category (e.g., parents who did not have their adolescent vaccinated were asked: *I noticed that you did not return the vaccine consent form and that is fine, but please tell us a little bit about the reasons for that*).

## Analysis

Data were analyzed using framework analysis (Gale, Heath, Cameron, Rashid, and Redwood, 2013). This began with familiarization of the range of responses provided, followed by development of a thematic framework and response coding. Familiarization began during the data collection phase as interviews were transcribed and the audiotapes were reviewed. A thematic framework was then developed that included the following themes: behavioral results of the initial phone interview (i.e., signing consent form), knowledge about HPV and the HPV vaccine, intentions, issues related to follow-through, issues related to decision-making, feelings about follow-through, the follow-through system used, and the ability to identify necessary strategies to vaccinate. Accuracy of a participant's knowledge was determined by comparing responses to information provided on the Centers for Disease Control and Prevention website about HPV vaccination. The themes were used to code or index the data, and then distributed into relevant text files.

Participants from each of the 6 categories were recruited until saturation was achieved (i.e., the point at which no new themes, concepts, or issues emerged) or until no more parents in that category could be recruited. Two researchers/authors (BA, JM, or MS) read and individually coded each interview. The researchers then discussed and agreed upon codes. When disagreements occurred regarding interpretations of themes, they met and discussed the original transcripts with a third researcher (BA or MS) until consensus was obtained. All three coders have graduate training in clinical psychology and have previously published studies that utilized qualitative methodology.

## Results

### Sample Descriptors

Fifty parents were recruited from December 2013 and March 2015, which included 10 parents from the Yes/Yes category, 7 from the Yes/No category, 9 from the Unsure/Yes, 13 from the Unsure/No category, 6 from the Eventually/No category, and 5 from the Never/No. See Table 1 for additional information about recruitment. Participants included mothers/female guardians ( $M_{age} = 43.4$ ) of adolescents ( $M_{age} = 14.9$ , male = 68%). Race-ethnicity of the sample was: 28% non-Hispanic white, 40% non-Hispanic black, 30% Hispanic, and 2% other. (Identification numbers (ID) are provided in parentheses below to denote the participant who provided the quote.)

### Themes by Intention/Behavior Category

**Yes/Yes category (n = 10):** Parents in this category described being knowledgeable that the vaccine prevented cancer, though they may not have known the specific type of cancer. For example, one parent (ID 821) noted, *“(It is) just about getting your child vaccinated for the HPV virus to help with cancers, I guess.”* Other knowledge described included that HPV was sexually transmitted and that the vaccine prevented genital warts, was administered to both boys and girls, and was given in multiple shots. The only misinformation described was that the HPV vaccine was school-mandated.

These parents described having favorable intentions toward vaccination using strong supportive language to describe their level of intention (e.g., ID 1137: *“I had every intention of returning it (consent form) back;”* ID 1305: *“I feel strongly about it;”* ID 1073: *“Because I wanted him to get it done, no question that my son should need it.”*). They described their intentions as being stable over time. Parents either seemed to think about the benefits of HPV vaccination or to have not put much thought into it at all. As one parent (ID 1073) stated, *“Some things you just know, I don’t think about it.”* Another (ID 1049) said, *“I don’t think about it, because I just sign it (vaccine consent form) and make an appointment.”*

Yes/Yes parents described themselves as being the decision-maker for vaccine uptake. One parent (ID 501) emphatically said, *“He knew he didn’t have a choice.”* While these parents did not describe involving others in the decision, one parent noted that her sister-in-law attempted to influence her to NOT have her adolescent vaccinated, but that she resisted this influence. Parents noted informing their adolescent of the need to vaccinate and described

the adolescent's response as being non-resistant or in agreement (e.g., ID 663: "*He didn't give me a hard time.*")

Yes/Yes parents cited prompt return of the vaccine consent form as their way of making sure to complete the task of vaccination. One parent (ID 501) said, "*I wouldn't wait...I wanted to get it done*" and another (ID 1137) said, "*my plan was just to return it back as soon as possible.*" A few others described prompt return of the vaccine consent form as a way to prevent the form from being forgotten or lost (e.g., ID 1049: "*if you put it aside, you forget about it; so I could make sure it was in the mail and not lost somewhere.*") These parents noted using systems to ensure they remembered to return the vaccine consent form (e.g., setting the vaccine consent form in a place where they regularly keep important information, such as dresser). They described getting vaccinated at the SBHC as being easy and when obstacles were noted (e.g., school closed during summer, teen attending school without an SBHC), they noted ways of overcoming those barriers.

**YES/NO category (n = 7):** Knowledge reported by parents in this category included that the vaccine prevented cervical cancer and other cancers and genital warts. One parent (ID 447) described particularly detailed knowledge of the vaccine: "*I know Gardasil is a multivalent vaccine for the human papillomavirus. One of the things it covers is the strain that does cause most of the cervical cancer, can also cause throat cancers, anal cancers, penile cancer. You know, it's very well-tolerated, they've done more clinical trials on this vaccine I think than pretty much any other vaccine ever.*" Misinformation shared included that HPV was pronounced as "HIV" and that males described as being carriers of the infection and not thought to be susceptible to developing HPV-related diseases.

Parents in this category either described always supporting vaccination, reporting that they returned the consent form and thought their adolescents had been vaccinated at the SBHC when in fact they had not OR described some level of hesitancy toward acting on vaccination. When describing their hesitancy, some parents noted that they needed more information, however they had not sought out information on their own. Additionally, the concept of "urgency" or a need to act swiftly came up in their responses. One Yes/No parent noted that urgency was greater now that her adolescent was sexually active.

Yes/No parents indicated that they involved their husband/adolescent in the decision-making process, not seeming to view the decision as theirs alone to make. For instance, (ID 620) "*I asked him about taking it;*" and (ID 58) "*because it wasn't only my decision*"). When talking about vaccination with their adolescent, they said they discussed the benefits of the vaccine and the need to prevent disease. Yes/No parents described both favorable and unfavorable reactions toward vaccination on the part of the adolescent. One parent (ID 58) said, "*he wasn't really trying to really too much hear it.*"

Yes/No parents who thought they had vaccinated their adolescents described using systems to remember to make the appointment (i.e., sticky note reminders, phone reminders, placement of consent form near items that would trigger recall to return form). Parents who acknowledged NOT having their adolescents vaccinated cited a variety of reasons for not completing this task: losing or forgetting to return the vaccine consent form, not making



plans to vaccinate, making a plan to vaccinate that was not specific or was deemed ineffective, and experiencing barriers (e.g., school closed during summer, lack of insurance, difficulty getting consent form, adolescent's busy schedule, vaccine not available at clinic) wherein solutions were either not generated or believed to be unlikely to succeed.

**Unsure/Yes category (n= 9):** Parents in this category described researching the vaccine from a variety of reputable sources (e.g., doctor, pharmacy website, CDC, medical journals). One parent (ID 372) even noted, *“And so I tend to, like, want to stay near the websites that are like New England Journal of Medicine. I try to be careful where I go, so that I’m getting fact and not fiction, or someone else’s opinion.”* Another stated (ID 495), *“I try to use something that has an updated journal article, like within the last six months, because there’s just so much out there.”* These parents described being aware that HPV was a sexually transmitted disease that caused cervical and other cancers. The only incorrect information cited was in regards to the recommended age range for the vaccine and the effect of HPV on males (i.e., males were thought to only be carriers of HPV).

Parents in this category indicated that initially they were undecided about or even against vaccination but that later they became supportive of vaccination. They cited learning of their adolescent's sexual behavior or realizing their adolescent would have an increased opportunity for engaging in sex as reasons for their increased urgency in getting their adolescent vaccinated. As one parent (ID 492) stated, *“they were doing some oral kinda stuff, which kids these days don’t count that. And so that made me completely change and say, “I better get this done.”* Another (ID 522) said, *“She went off to college. She swore to virginity and purity while she was home, so I just didn’t wanna take a chance for her to go off to college and hook up with somebody and I didn’t protect her.”* Unsure/Yes parents also stated that their uncertainty for vaccinating changed to more favorable intentions with information obtained from their health care providers or from research they did on their own from reputable sources (e.g., journal site, Centers for Disease Control and Prevention). One parent (ID 1076) noted, *“If I hadn’t spoken to the doctor about it, I wouldn’t have changed my mind... I had no intention of having him vaccinated when we went into the doctor’s office. And we walked out with him vaccinated.”*

Unsure/Yes parents described a delay in returning the form, primarily because they wanted to research the HPV vaccine further or wanted to seek vaccination at their regular pediatrician. For example, one parent (ID 719) said, *“I kept it a few days, just to read up a little bit on it.”* Once decided, parents described seeking vaccination right away, citing a variety of reminder systems to help them either return the form promptly or schedule the appointment on their own (e.g., put form in a to-do pile on table/in purse, used a list, put appointment in calendar, put scheduling of vaccine appointment on mental list). They described the process of getting their adolescent vaccinated as easy. A few noted that they considered the barriers (e.g., adolescent schedules, adolescent resistance) and developed strategies for overcoming barriers to vaccination (e.g., for an adolescent expressing resistance to vaccination, his mother (ID 495) said that she *“bribed him with a Popsicle.”*). Unsure/Yes parents noted that they would have felt regret if they had not vaccinated. As one parent (ID 522) noted, *“I would regret it if I had the opportunity to protect my children and I didn’t take advantage of it.”*

**Unsure/no category (n= 13):** Parents in this category said they received information about the vaccine from a variety of sources, including the CDC, commercials, websites, and Facebook groups. They described both accurate information about HPV and the vaccine (e.g., that HPV caused cancer and genital warts, was sexually transmitted and that provided protection against HPV) as well as inaccurate information (e.g., HPV caused deaths). When parents described accurate factual information about the vaccine, they sometimes used language that indicated their disbelief in that information. For example, one parent (ID 484) noted, *“they’re (the two HPV vaccines on the market) supposed to be to prevent HPV...or it’s (HPV) said to cause cervical cancer).”*

Parents in this category described a range of intention levels with most stating that they continue to be ambivalent or against vaccination. The one parent who said that she was in favor of vaccination thought her adolescent was vaccinated by the SBHC (SBHC medical records indicated otherwise). When describing ambivalence, parents hinted at a certain intention level that needed to be reached in order to facilitate vaccination. For example, one parent (ID 670) said, *“I would say I’m like midway.”* Another (ID 512) stated, *“I’m just on the fence. I’m like right in the middle; I’m still [toddling], you know, right there... I haven’t fallen over yet.”* Others (ID 1302) used language such as *“leaning toward (getting adolescent vaccinated).”* The main reason cited for moving parental intentions toward vaccination was information from reputable sources (e.g., doctor). Unsure/No parents often described wanting to “wait” for their adolescent to get vaccinated and cited various reasons for doing so: to obtain more information about the vaccine from sources (e.g., doctor), to allow more time to pass to see if any long-term side effects from the vaccine arose, to enable their adolescent to become old enough to make the decision, and to wait until their adolescent became sexually active. Those describing themselves as leaning away or against vaccination cited various health beliefs and social influences consistent with HBM/TPB as reasons to not vaccinate (e.g., did not perceive the vaccine to be beneficial, adolescent was not sexually active, believed vaccine is still undergoing research, perceived the vaccine to cause serious problems or death, thought there were too many vaccines, thought the vaccine had too many ingredients, father is against it).

Unsure/No parents typically involved others in the decision-making process for HPV vaccination. Some even noted that they deferred to the adolescent to make the decision. For example, one parent (ID 500) said, *“we would let him decide, if it’s something he really didn’t want to do or if it was something he felt strongly either way, then we’d probably go with that.”* Two reasons cited by parents for involving the adolescent in the decision-making process were diffusion of responsibility for any negative outcomes resulting from vaccination and assistance with deciding the appropriate timing for vaccination. For example, one parent (ID 877) stated, *“so having her be able to have a say and decide also made me a little more comfortable...then now later if something happened, then it’s like, oh, you know, we — we both kinda. You know, mama didn’t just thrust this on you.”* Another (ID 1250) said, *“so I think he needs to know that information ahead of time ... so that when he sees that he’s moving towards that direction (becoming sexually active) ... then he can say, “I need to get vaccinated.”*

Unsure/No parents often described no regret for not vaccinating. As one parent (ID 511) stated, *“I try not to dwell on shoulda, woulda, couldas.”* Parents indicated that they did not make any plans for vaccinating. When asked about planning, one parent (ID 511) said, *“I gave it no thought ... outta mind, outta sight.”* The main reason given for NO planning was that parents had not decided to get the vaccine yet. Parents said that if they did decide, they likely would get their adolescent vaccinated right away to be sure that it gets done. A few parents brought up a concern that systems to help remind them to vaccinate may not be effective, because they often lose items or store them in places they forget. Some obstacles to vaccination were reported (e.g., adolescent’s school schedule, adolescent refusal, clinic out of stock of vaccine, lack of insurance) as well as solutions to overcome barriers (e.g., make appointment after hours).

**Eventually/No category (n = 6):** Parents described not being very knowledgeable about HPV or the vaccine and information they did provide was often inaccurate (e.g., HPV vaccine prevents infections like mumps and measles; HPV causes chlamydia). One parent correctly noted that she was aware that there was a new vaccine coming out that prevented more types of HPV. When describing sources for information about HPV and the vaccine, parents cited commercials and the CDC but noted not remembering much about these sources.

Parents in this category described being ambivalent toward vaccination. Those who described leaning toward vaccination cited adolescent’s sexual status and new knowledge that the vaccine was also for boys as reasons for their increased intention. Others described needing more information about side effects and wanting to wait longer, believing the vaccine was too new. A lack of urgency was noted. One parent (ID 766) said that she did not view HPV vaccination as a *“pressing issue, because he’s not (sexually) active currently.”*

Eventually/No parents indicated that they sought agreement from their adolescent or allowed the adolescent to make the ultimate decision about vaccination, stating that the adolescent should have a choice given that they were the ones being vaccinated. One parent (ID 769) said, *“if it’s an optional vaccine. It’s their body we’re doing it to.”* Another (ID 766) said, *“I kinda feel like when he’s old enough, he can make that decision, since it’s his body.”* Parents indicated that their adolescent’s rationale for declining vaccination was because they were not sexually active. One (ID 1215) stated, *“He said he wasn’t having sex yet, so he wasn’t worried about it right now.”*

Eventually/No parents often described being indifferent or not having any regret for not yet vaccinating. Only those waiting for the appointment time to come described planning processes that they used. Parents who had not made an appointment described the effort to get the vaccine as being too time-consuming or difficult, citing paperwork and schedule conflicts as barriers. One parent (ID 769) noted that *“planning”* in and of itself was a barrier and that she needed assistance.

**Never/No category (n = 5):**

Knowledge cited by parents in this category included that HPV was a sexually transmitted infection and that the vaccine prevented cancer. The only source of information cited was the

internet, specifically WebMD. Parents noted some misinformation, such as that the vaccine was not well researched and that the vaccine *“don’t stop it (HPV infection), you know, prevent them from getting it, but it’ll-I think slow the process down.”* (ID 368)

Parents in this category indicated that were still unsure or never had and never will have intentions to vaccinate. They often used strong language to describe their intention not to vaccinate. One parent (ID 502) said, *“I’m positive I don’t want her to have it at this time,”* and another (ID 929) noted, *“I just feel strongly. I don’t feel like she really needs the vaccination.”* Parents cited the following health beliefs/attitudes that could be conceptualized within HBM and TPB as reasons for not wanting to vaccinate: vaccine being too new, too many vaccines for immune system to handle, vaccine not relevant to his/her adolescent, vaccine might not work, potential harmful side effects of the vaccine, prevention can occur through other “natural” ways (e.g. vitamins and nutrients), and adolescent is at low risk.

Parents in this category indicated that they would allow the adolescent to make the decision or would not go against their adolescents’ wishes if the adolescent wanted the vaccine. As stated by one parent (ID 1013), *“I think my whole idea though is basically I don’t think I would make decision for her.”* That parent described trusting her adolescent and relying on their good relationship and communication to decide the timing of vaccination (i.e., *“Mom, I am sexually active. I like this boy, and if this vaccine will help me...I think I want to take it. She’s pretty smart.”*)

Never/No parents described feeling confident in their decision to not vaccinate, noting no regret. Parents indicated that they had not used or attempted to use any planning strategies or systems to follow through with vaccination. A few described not putting much thought in to the planning process. For example, one parent (ID 304) said, *“I always forget about it ... It doesn’t cross my mind.”* When queried about ease of vaccination and potential obstacles, parents noted that once decided, getting the vaccine would not be a problem, only citing a few barriers (e.g., adolescent fear of shots, clinic out of vaccine) that could be overcome with solutions (e.g., *“prep her”* for shot pain).

## Discussion

Our findings add to the vaccine acceptability literature by providing a more in-depth analysis of parental vaccine intentions and their influence on behavior. Traditionally, the focus in the vaccine acceptance literature has been on identifying attitudes and beliefs (per the HBM/TPB) (Cunningham-Erves et al., 2015; Priest et al., 2015; Wang et al., 2016; Wilson et al., 2016) related to intentions, presuming that intentions equated with behavior. Our study and results go a step further by identifying potential areas to explore as possible reasons for the gap between intentions and behavior.

Themes gleaned from our data indicate that characteristics of the intention construct (strength and stability) could play a key role in the vaccine intention-behavior relationship. Some parents described having strong intentions for or against vaccinating, often using emphatic sounding language. Others described their intentions as being in the middle or *“on the fence.”* Still others described *“learning toward”* or *“away”* from vaccinating. Most

interesting was the fact that there seemed to be a certain threshold that needed to be reached in order for a parent to act on their intention. Once that threshold was reached, parents said that they no longer contemplated or would contemplate reasons for or against vaccination, rather they focused on or would (if decided) focus on completing the act of vaccination. Our data also indicated that temporal stability of intentions could be an indicator of strength of intentions, perhaps providing a protective effect against competing cognitions about vaccination (Cooke & Sheeran, 2004). That is, parents describing strong, stable intentions also noted not seeking advice from others, with one even describing being resistant to external influences that opposed her intentions. In other words, parents described a close-mindedness to receiving new information about vaccination once the threshold for the decision was reached. In all, these results support what extensions of traditional health behavior theories (i.e., action-based theories) have proposed; once a decision is made, a shift in mindset takes place from that of deliberating over the reasons for or against enacting the behavior to that of implementing it (Gollwitzer, 2012; Schwarzer, 2008).

Understanding the reasons for unstable intentions is important for guiding conversations with parents about vaccines. Reasons for instability cited by parents in our study fell within the traditional constructs of the HBM and TPB (e.g., risk-benefit analysis). For example, parents described feeling more “pressed” to get their adolescent vaccinated due to experiences that influenced their risk perception (e.g., learning new information about HPV-related diseases). Some parents even seemed to have a set time in mind for getting the vaccine, typically when the adolescent was expected to become or had already become sexual active or when the adolescent informed their parent about of their plans to become sexually active. This set time is problematic, because to be most effective, the HPV vaccine should be given *prior to* sexual initiation (Centers for Disease Control and Prevention, 2007, 2011). Parents also described intentions as moving toward vaccinating when thinking of the benefits of the vaccine and against vaccinating when thinking about the risks (e.g., long-term unknown side effects). Also, parents lack of knowledge and/or misinformation about vaccination (e.g., causes death) also seemed to play a role in their intentions to get their adolescent vaccinated. Perhaps what was most interesting was how parents handled or coped with their ambivalence or instability of their intentions. Some sought out information on their own while others described deferring responsibility to others to make the decision. Not surprisingly, those who described seeking information from credible sources (e.g., providers, CDC) noted that the information swayed them toward vaccination. These data are consistent with the Model of Ambivalence-Induced Discomfort (van Harreveld et al., 2009), which posits that discomfort from ambivalence can be reduced through active or passive coping strategies. It is not clear what factors (e.g., strength of ambivalence, demographics, personality/situational variables) influence a parent’s use of active versus passive coping strategies to reduce the discomfort. However, understanding these influences could help guide further research aimed at developing strategies that trigger active coping, such as seeking of information from credible sources for resolving ambivalence regarding vaccination.

Our data also indicated that planning may be another area to further explore as possible reason for the vaccine intention-behavior gap. Even when intentions were favorable, parents may not follow through with vaccination due to barriers. Thus, having a plan in place can

help parents to overcome those barriers. Our results suggest that these barriers may include parent forgetfulness, clinic and cost barriers, family schedule conflicts, and resistance from others, including the adolescent. Some effective solutions described by parents were completing the vaccine task immediately (i.e., returning consent form right away), developing a specific plan, using reminders, and anticipating and implementing solutions for barriers. Hence, providers/clinics should consider developing strategies to assist families in the planning for vaccination.

Our results suggest parental assumption that the adolescent has been vaccinated when in fact he/she had not, resulting in a gap between intent and behavior. It is possible that the consent forms were lost in the mail or somewhere at the clinic. That said, it is quite possible that these parents remembered incorrectly about returning their form or provided what they believed to be a socially-desirable response. Inaccurately believing that their adolescent had been vaccinated would understandably prevent parents from seeking out or agreeing to vaccination at another clinic site. This finding emphasizes the need for “best practice” infrastructure around the delivery of vaccines. This could include regularly assessing clinic vaccine rates, maintaining a centralized location for recording all vaccines (e.g., medical chart, immunization registry, and parent portable record), and developing office procedures to minimize missed opportunities (American Academy of Pediatrics, 2013).

### **Research Implications:**

This study highlights the importance of broadening our identification of variables influencing vaccine acceptance. This may require looking to other theories, such as action-based models (Gollwitzer, 2012; Schwarzer, 2008) and the Model of Ambivalence-Induced Discomfort (van Harreveld et al., 2009), to provide guidance in the design of future quantitative studies. Such studies should attempt to assess planning variables (e.g., actual plans, coping plans) and coping strategies for ambivalence in addition to assessing knowledge and beliefs toward vaccination. Our results also indicate the need for measures that capture both strength and fluctuation of intentions. Thus, researchers are encouraged to consider using measures of intentions that allow for a graded response of intensity (Conner & Norman, 2015) over multiple time-points. With results from research that examine both pre-intentional motivation processes as well as post-intentional volition processes and that uses more nuanced measures of intentions, interventionists will be better equipped to design effective strategies to increase HPV vaccination rates.

### **Clinical Implications:**

As has been previously recommended, providers are encouraged to start the vaccine conversation by providing a presumptive recommendations and if hesitancy is noted to follow-up with more open-ended questions about the parents’ concerns (Unity - United for Adolescent Vaccination, 2018). Our data suggest that it may be helpful to assess where parents fall on the continuum with regard to the strength of their intention. Depending on whether parents are still in the deciding phase or ready to act, providers can adjust their conversation accordingly. That is, with parents who are ambivalent or against vaccination, providers could aim to not only increase intentions but also the urgency to vaccinate. This could involve correcting misinformation and targeting their main concern(s), so that they see

the importance of making vaccination a priority and acting swiftly. For example, providers could educate parents about the risk of infection, importance of timely vaccination, and vaccine safety, and encourage active coping with ambivalence by referring parents to credible sources to gather additional information. Additionally, providers could inquire about the key persons involved in the decision-making process and direct their conversation accordingly. When counseling parents who hold favorable intentions to vaccinate, providers are encouraged to focus their conversation on the act of planning out vaccination. That is, providers could recommend that these parents make the appointment for follow-up vaccine doses right away, help them identify barriers to future appointments/vaccination (e.g., schedule conflicts, adolescent resistance), and develop solutions for overcoming these barriers, and set up reminders for vaccination.

### **Limitations:**

The qualitative design of this study allowed us to take the first step of identifying factors that could influence the vaccine intention-behavior relationship. However, there are a number of limitations that should be noted. First, we asked parents to retrospectively describe their intentions over time, which could have led to some inaccuracies in descriptions. Second, our sample was recruited from a larger sample of parents who agreed to participate in a brief message intervention about HPV vaccination, and thus the results may not be generalizable to more general populations who have not received information on the HPV vaccine. Likewise, the focus was on immunization in Southeast Texas at a school-based health clinic, and thus our results may not generalize to parents of adolescents in other regions and clinic settings. Next, while our sample only included female parents, thereby limiting our ability to describe male parents/guardians and adolescents' views of the vaccine decision-making and follow-through processes, research indicates that mothers tend to be the primary decision-makers of children's health care (Kaiser Family Foundation, 2003). Third, while our overall sample size is adequate for qualitative research, we recognize that the sample sizes for some of the categories were low (e.g., the Never/No category). This was unavoidable as the categories were created based on intention-behavior data from the larger sample. Some of the categories (e.g., Unsure/Yes, Never/No) inherently had small samples from which to recruit, and thus even with strong recruitment efforts, we were limited. That said, we were able to recruit adequate percentages of eligible participants from those categories. It also should be noted that several of the parents from the Yes/No intention-behavior category had non-working numbers.

### **Conclusions:**

The vaccine intention-behavior relationship is complex and could be moderated by characteristics of the intention construct and key planning variables. Future research is needed to: 1) further explore possible reasons for the vaccine intention-behavior relationship gap (e.g., intention characteristics, planning variables) via quantitative studies, 2) identify factors that influence coping response to ambivalence regarding vaccination, and 3) develop communication tools and strategies tailored to parent intention level. Such research efforts should aim to enroll all parties (i.e., fathers, mothers, adolescents) involved in the decision-making and follow-through processes. Health care providers are encouraged to consider the

phase that parents are in with regard to enacting vaccination behavior (i.e., motivational, implementation) and target their conversations accordingly. Lastly, utilizing and developing strategies to aid parents' recall of their adolescents' immunization status could help reduce the vaccine intention-behavior gap.

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**Table 1.**

Recruitment Table: Number of Participants, Number of Attempted Contacts, Outcomes of Recruitment Attempts, and Number of No Shows for each Intention-Behavior Category

Category	Total	English	Attempted to Contact	Unable to Reach	Number Disconnected	Declined	Undecided	No show*	Recruited
Yes/Yes	97	81	55	19	15	0	4	7	10
Yes/No	68	60	60	12	29	2	7	3	7
Unsure/Yes	28	26	25	8	3	0	4	1	10
Unsure/no	157	124	40	17	3	0	5	2	13
Eventually/no	32	31	31	14	5	3	2	1	6
Never/no	27	26	20	7	7	1	0	0	5

\*\* Did not keep appointment to interview