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# Adolescent Sexual Risk Reduction and the Theory of Planned Behavior: Moderation Effects and the Role of Previous Experience

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ADOLESCENT SEXUAL RISK REDUCTION AND THE THEORY OF PLANNED  
BEHAVIOR: MODERATION EFFECTS AND THE ROLE OF PREVIOUS EXPERIENCE

by

CHRISTYL Y. WILSON

Under the Direction of Gabriel P. Kuperminc, PhD

ABSTRACT

The theory of planned behavior (TPB) is a useful model for understanding social-cognitive determinants (i.e. attitude, perceived norms, and perceived behavioral control) of sexual risk reduction among adolescents. However, research using the TPB has emphasized main effects and has not considered the possibility of moderated associations. In addition to testing main effects, this study assessed the interactions between TPB constructs and investigated the influence of previous sexual experience when predicting adolescents' intentions to use condoms and delay sexual activity. Results indicate that the TPB functions differently depending on previous sexual experience and type of risk reduction behavior. Perceived norms were the only consistent predictor of intentions for condom use and delay. Attitude moderated perceived behavioral control when predicting condom use intentions among sexually experienced youth. However, no other interaction effects were detected. Future directions for research and implications for practice are discussed.

INDEX WORDS: Theory of planned behavior, Adolescent, Sexual risk reduction, Intentions

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CHRISTYL Y. WILSON

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Arts

in the College of Arts and Sciences

Georgia State University

2015

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2015

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## **DEDICATION**

I dedicate this thesis to my parents for their persistent support and encouragement – to Papá for always believing in me and to Mother for being a voice of reason when I was doubtful and providing comedic relief when I felt overwhelmed.

## ACKNOWLEDGEMENTS

Completing this thesis would not have been possible without the support of many people. Many thanks to my adviser and committee chair, Gabriel Kuperminc, for helping me to make sense of the whole process and supporting me throughout this milestone. I also express gratitude to members of my writing group for enduring several revisions of this thesis and offering encouragement and laughter along the way. Thanks to my committee members, Laura Salazar and Chris Henrich, for feedback and guidance. And finally, thanks to Kimberley Broomfield-Massey and staff at the Center for Black Women's Wellness for making this research possible.

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## 1 INTRODUCTION

Risky sexual behavior among adolescents is an important social problem given the rates of sexually transmitted infections (STIs), HIV, and teen pregnancy in the United States. According to the Centers for Disease Control and Prevention (CDC), adolescents and young adults (ages 13-24) are disproportionately infected with HIV each year (CDC, 2014a) and the prevalence of chlamydia and gonorrhea is highest in people between the ages of 15 and 24 years (CDC, 2014b). Although pregnancy and childbearing rates for women between the ages of 15 and 19 have declined substantially since 1991 (Kost & Henshaw, 2014), rates of teen pregnancy are considerably higher in the United States than in other developed nations (Kearny & Levine, 2012).

Sexual risk behaviors include early sexual debut, multiple partners, and failure to consistently use condoms or other forms of birth control (Carlson, McNutty, Bellair, & Watts, 2014). According to a recent survey, 47% of high school students reported engaging in sexual intercourse, 6% did so before the age of thirteen, and 15% reporting having four or more sexual partners. Failure to use condoms consistently is the most pervasive sexual risk behavior among adolescents. Forty percent of sexually active high school students reported not using a condom the last time they had sex (CDC, 2013b).

Two options for reducing sexual risk are consistent condom use and delayed engagement in sexual intercourse. Identifying correlates and predictors of these risk reduction behaviors informs efforts to develop interventions (Crosby et al., 2013; Jemmott & Jemmott, 2007). One theory that is useful for this purpose is Icek Ajzen's (1991) theory of planned behavior, which combines cognitive appraisals, normative influences, and perceptions of control to predict intentions and behaviors.

## 1.1 The Theory of Planned Behavior

The theory of planned behavior (TPB) is a well-established social-cognitive model for predicting a variety of human behaviors (Ajzen, 2011). The TPB is a linear model (Figure 1): attitudes, perceived norms, and perceived control directly influence behavioral intentions, which, in turn, affect behavior (Ajzen, 1991).

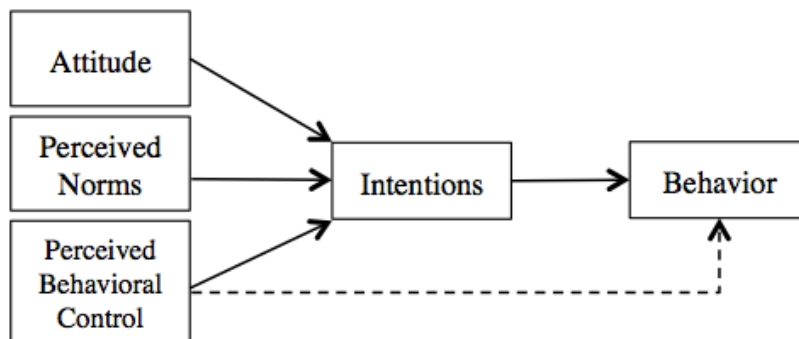


Figure 1 The theory of planned behavior (Ajzen, 1991)

As the immediate antecedent of behavior, intentions capture an individual's motivation and are a good indicator of the level of effort people are willing to make to accomplish a task (Ajzen, 1991). Attitude refers to individuals' positive or negative evaluation of a behavior, including their assessment of the physical, social, or self-evaluative outcomes or consequences. Attitudes are formed based on expectations regarding the potential benefits or disadvantages of a given behavior (Ajzen, 1985). Perceived norms refer to the amount of social pressure to perform a given behavior. Originally, the TPB included only subjective norms, which indicate the extent to which individuals believe that important referents (family, friends, romantic partners, etc.) would approve or disapprove of a behavior (Ajzen, 1991). More recently, however, authors of the theory have acknowledged the importance of descriptive norms, which are perceptions of what others are actually doing (Fishbein & Ajzen, 2010). Finally, perceived behavioral control (PBC) indicates an individual's judgment of their ability to execute a given behavior, taking into

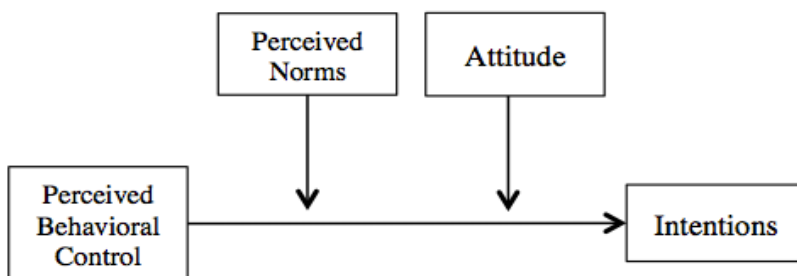
consideration past experience and foreseeable obstacles. Ajzen included PBC as an extension of the theory of reasoned action (which includes only subjective norms and attitudes) to allow for the prediction of intentions and behaviors that are not completely under volitional control (Ajzen & Fishbein, 1980; Ajzen, 1991). Research has shown that an individual's confidence, or sense of efficacy, is a strong determinant of actually performing a behavior (Ajzen, 1991; Bandura, 1986; Bandura, 1997). In contexts where an individual has sufficient *actual* control over a behavior, it is expected that the person will indeed perform that behavior when given the opportunity. Many factors, however, can limit a person's perceived control. For example, a woman may perceive that her ability to use male condoms is limited. Thus, to the extent that PBC is representative of *actual* control, it is theorized to have a direct association with behavior (Figure 1; Ajzen, 1991). Generally speaking, favorable attitudes, supportive perceived norms, and high PBC contribute to stronger intentions to execute a given behavior.

The TPB holds that the predictive power and relative importance of attitude, norms, and perceived behavioral control are context-specific (Ajzen, 1991). For example, the TPB has been found to account for as much as 43% of variance when predicting intentions for fruit and vegetable consumption (Kothe & Mullen, 2014), but only 12% of the variance when predicting intentions to quit smoking (Høie, Moan, & Rise, 2010). When predicting women's intentions to use condoms, the most influential TPB construct was attitude, whereas for men, PBC was most highly associated with intentions (Muñoz-Silva, Sánchez-García, & Martins, 2007). Thus, the power of the model and its constructs varies across behavior, population, and context.

## **1.2 Moderation Effects within the Theory of Planned Behavior**

The TPB is often utilized as an additive model, such that its constructs have a linear relationship with intentions or behavior (Figure 1). However, critics argue that considering only

the direct, additive effects may be inadequate when predicting intentions (Eagly & Chaiken, 1993; Yzer, 2007). It is compelling to conceptualize the TPB in terms of how its constructs moderate one another (as seen in Figure 2). Eagly and Chaiken (1993) employ an example of shouting in a library to illustrate the idea that even when people perceive a behavior to be completely under their control, a negative appraisal of the behavior may hinder their intentions to perform it. Similarly, adolescents may believe that they can successfully obtain and properly use a condom, but the perception that their close peers would not endorse that behavior might thwart intentions to do so. The logic from these examples provides a foundation to support the TPB as an interactive model, whereby norms and attitudes moderate the influence of perceived behavioral control on intentions. Still, these interactions have yet to become a central tenet of the theory.



**Figure 2 Hypothesized moderation effects**

Despite compelling rationale, empirical research on moderating effects within the TPB is lacking. Most research has examined only the main effects of the TPB constructs on intentions and behavior. A majority of the studies that have investigated any interactions have sought only to test whether the additive effects suggested by the TPB are moderated by other factors, such as past behavior (Høie et al., 2010), demographics (Ellis, Kosma, & Symons Downs, 2013), or self-identity (Cheng & Chu, 2014).

The few studies that have assessed moderating effects within the TPB have demonstrated that the interactions between variables in the model accounted for a significant proportion of variance in behavioral intentions, above and beyond the direct effects of each construct (Castanier, Deroche, & Woodman, 2013; Conner & McMillan, 1999; Kidwell & Jewell, 2003; Kothe & Mullan, 2014; Umeh & Patel, 2004). While these studies support the legitimacy of interactions between the TPB constructs, they have not considered these moderation effects in the context of adolescent sexual risk reduction behaviors. Insofar as context may influence the predictive power of the TPB model (Ajzen, 1991; Armitage & Conner, 2001), we cannot assume that the results from these studies are directly applicable to sexual risk reduction among adolescents.

### **1.3 The Context of Adolescent Sexual Risk Reduction**

Adolescence is marked by the initiation of risky behaviors, including sexual risks that make youth susceptible to unplanned pregnancy or the contraction of STIs or HIV (Pharo, Sim, Graham, Gross, & Hayne, 2011). It is particularly important, therefore, to understand determinants of risk reduction behaviors in this population. Numerous studies have shown that social cognitive constructs, such as those in the TPB, are associated with risk reduction behaviors among adolescents. For example, adolescents who perceive abstinence or safe sex practices among their peers or partners are more likely to adopt these risk reduction behaviors (Buhi & Goodson, 2007; Crosnoe & McNeely, 2008; DiClemente, Salazar, & Crosby, 2007; DiIorio et al., 2001; Santelli et al., 2004). Teens are also more likely to adopt risk reduction behaviors if they have positive attitudes about the outcomes of condom use or abstinence, such as the prevention of STIs or unplanned pregnancy (Jemmott & Jemmott, 2007; Watts & Nagy, 2000). Having a sense of control or confidence in the ability to use condoms has also been found to be



associated with intentions to use condoms and actual condom use (Buhi & Goodson, 2007; DiIlorio et al., 2001; Santelli et al., 2004). In sum, much is known about the main effects of social cognitive constructs on sexual risk-reduction intentions among adolescents. What is lacking is information about how these constructs moderate each other to determine risk reduction intentions in this population.

Within the context of adolescent sexual risk reduction, there has not been much focus on the effects of previous sexual experience. Research tends to focus on the experiences of sexually active adolescents and does not typically differentiate study samples based on past sexual behavior (Nahom et al., 2001). Past experience is important to consider because it shapes attitudes, perception of norms, perceived behavioral control, and intentions to engage in future behaviors (Ajzen, 1991; Bandura, 1986; Bandura, 1997). For example, an adolescent who has already used condoms during sexual intercourse has a more tangible understanding of what it takes to execute this behavior, and is therefore likely to have different attitudes or perceptions of control than an adolescent who has never used condoms. Nahom et al. (2001) demonstrated that adolescents differed in perceptions of norms and intentions to have sex or use condoms based on their past sexual experience. They found that sexually experienced teens were significantly more likely to intend to engage in sexual activity in the future, less likely to intend to use condoms, and more likely to perceive peer pressure to have sex than teens who were not sexually experienced. These findings highlight the context specific nature of the constructs in the TPB. Even within the context of adolescent sexual risk reduction, there is variability in the ways in which attitudes, perceptions of norms, perceptions of control, and intentions are formed.

#### **1.4 Study Aims and Hypotheses**

The current study uses the theory of planned behavior (TPB) to examine adolescents' intentions to reduce sexual risks. The aims of this study are to (1) determine how attitudes, norms, and perceived behavioral control contribute to adolescents' intentions to use condoms and delay sexual activity, (2) investigate possible interactions between these contributors, and (3) assess whether the TPB functions differently based on previous sexual experience.

Consistent with the large body of research that has applied social cognitive theories or constructs to investigate adolescents' intentions for sex-related risk reduction behaviors (e.g. Albarracín et al., 2001; Jemmott & Jemmott, 2007; Sikkema et al., 2005), it was expected that intentions to use condoms and delay sexual activity would be positively associated with positive attitudes, perception of supportive norms, and high perception of control over the behaviors.

To extend previous literature, it was hypothesized that perceived norms and attitudes would moderate the association between perceived behavioral control (PBC) and behavioral intentions; the degree to which PBC influences intentions may differ based on one's appraisal of the behavior (attitude) or their perception of what others believe and do (perceived norms). Specifically, it was predicted that PBC would have a stronger association with intentions when attitudes toward risk reduction were more favorable and when normative perceptions were most supportive of the risk reduction behaviors.

This study also tested the interaction between attitude and perceived norms. This interaction has been explored in only three known studies, but has not yet been found statistically significant (Conner & McMillan, 1999; Kothe & Mullan, 2014; Umeh & Patel, 2004). However, these prior studies did not include adolescents. The current study investigates a population for which social norms are particularly important (Pharo et al., 2011). Thus, it was expected that

perceived norms would moderate the association between attitude and intentions. While attitudes are an important predictor of intentions (e.g. Albarracín et al., 2001; Eagly & Chaiken, 1993), it was hypothesized that this association would be attenuated in the presence of strong perceived contradictory norms.

Prior research comparing sexually experienced and inexperienced youth found group differences in perceptions of norms and intentions to delay sexual activity (Nahom et al., 2001). The current study examined sexually experienced and inexperienced group in separate models. Because the power of the TPB model and its constructs varies across contexts (Ajzen, 1991), it was anticipated that the pattern of results might differ depending on previous sexual experience and type of risk reduction behavior.

## **2 METHOD**

### **2.1 The Teen Health Project**

The current study uses data from an evaluation of the Teen Health Project (THP), an evidence-based sexual health intervention. The original implementation of the THP is listed in the CDC's Compendium of Evidence-Based Interventions and Best Practices for HIV Prevention (CDC, 2013a), and was effective in increasing condom use and delaying sexual debut among high-risk adolescents in low-income housing developments (Sikkema et al., 2005). The present study uses baseline data from a replication of the THP for primarily African American youth in Fulton County, Georgia.

The goal of the THP is to increase adolescents' sexual risk reduction behaviors. Participants attend six workshops led by trained health educators in groups of 4-15 same-sex peers. These sessions focus on sexual health information, knowledge about STIs and pregnancy, and skills for condom use and delaying sexual debut or abstaining from further engagement in

sexual activity. A selected group of THP participants form a leadership council, which remains active for six months after the initial workshops. With support from health educators, the leadership council continues to reinforce positive norms for risk reduction behaviors and educate their peers about sexual risks through community-wide social events and activities.

## 2.2 Participants

Study participants included 393 adolescents residing in Fulton County, Georgia who were recruited to participate in the Teen Health Project. This sample consisted predominately of African-American (94%;  $n=369$ ) youth between the ages of 12 and 19 ( $M = 16.20$ ,  $SD = 1.49$ ). Sixty-one percent of the participants ( $n=240$ ) were female (see Table 1).

**Table 1 Demographic characteristics of all study participants**

	Sexually Experienced ( $n = 246$ )		Sexually Inexperienced ( $n = 147$ )		Total ( $n = 393$ )	
	Mean ( <i>SD</i> )	Freq. (%)	Mean ( <i>SD</i> )	Freq. (%)	Mean ( <i>SD</i> )	Freq. (%)
Age	16.55 (1.31)		15.76 (1.58)		16.25 (1.47)	
Gender						
Male		114 (46)		39 (27)		153 (39)
Female		132 (54)		108 (73)		240 (61)
Race						
African American		236 (96)		133 (91)		369 (94)
Latino/Hispanic		7 (3)		8 (5)		15 (4)
Asian/Pacific Islander		1		2 (1)		3 (1)
Caucasian/White		2		4 (3)		6 (2)
Previous Condom Use						
Consistent		179 (73)				
Inconsistent		67 (27)				

Note. Freq.=Frequency

### **2.3 Procedure**

THP staff recruited adolescents from middle schools, high schools, community centers, and apartment complexes in Fulton County, Georgia. Parents received a consent form that described the research study and requested permission for their adolescent to participate. Youth were required to return the parental consent form to Teen Health Project staff and provide informed written assent in order to participate in the research study.

Research staff set up netbook computers for data collection in vacant classrooms in schools or available rooms in community centers and apartment complexes. Participants completed the self-report questionnaire using an audio computer assisted self-interview (ACASI), which is known to be effective in collecting sensitive data from youth samples by enhancing accurate reporting and minimizing social desirability bias (DiClemente, Brown, Sales, & Rose, 2013; Turner et al., 1998). The ACASI included skip-pattern logic to appropriately display gender-specific questions and to avoid posing sexually explicit questions to those whom such questions did not apply. In order to encourage honest responses, research staff began each data collection session by assuring participants that their answers would remain confidential. Researchers also informed youth that they could skip any question or terminate the survey at any time for any reason without consequence. When possible, computers were set up in a way that prevented others from seeing a participant's screen. As an additional measure, each computer had a privacy screen filter. Research staff members were present during the entire data collection session to assist youth. The survey took approximately 45 minutes to complete. Each participant received a \$10 gift card after completing the survey.

## 2.4 Measures

Fishbein & Ajzen (2010) provide guidelines for TPB questionnaire construction. They advise that all items in the measure be self-directed and compatible with the behaviors in question. Using these guidelines, items used in the current study were selected from the Teen Health Project questionnaire, which was developed by Kathleen Sikkema and colleagues (2005) for the original evaluation of the intervention (See Appendix for a complete list of items used in this study). For each TPB construct, there are two subscales to correspond to the risk reduction behaviors of interest: condom use and delay.

### 2.4.1 Intentions

Intentions for risk reduction behaviors were rated on a 5-point scale (1=Strongly Disagree to 5=Strongly Agree). Condom use intentions were assessed using 2 items ( $r = .72, p < .01$ ): “In the next few months I will not have sex unless I use a condom,” and “In the next few months, I’ll make sure I have condoms anytime I think I might have sex.” Intentions to delay sexual activity were assessed using 2 items ( $r = .79, p < .01$ ): “In the next few months, I will not have sex,” and “I will not have sex in the next few months because I want to wait until I am older.”

### 2.4.2 Perceived Behavioral Control

PBC was assessed using a 10-point scale (1=Very Sure I Cannot to 10=Very Sure I Can). There were 4 items ( $\alpha = .74$ ) on the condom use subscale (e.g., “How sure are you that you can use a condom every time you have sex?”), and 4 items ( $\alpha = .84$ ) on the delay subscale (e.g., “How sure are you that you can wait to have sexual intercourse?”).

### **2.4.3 Perceived Norms**

Participants rated items about perceived norms on a 5-point scale (1=Strongly Disagree to 5=Strongly Agree). There were 6 items ( $\alpha = .74$ ) on the condom use subscale, and 6 items ( $\alpha = .75$ ) on the delay subscale. The perceived norms scales included both descriptive norms (e.g., “My friends in THP always use condoms during sexual intercourse”) and subjective norms (e.g., “My boyfriend or girlfriend thinks it is okay or even good to wait until you’re older to have sexual intercourse”).

### **2.4.4 Attitude**

Participants responded to items regarding their behavioral beliefs and outcome expectations, which underlie attitude formation (Ajzen, 1985). These items were rated on a 5-point scale (1=Strongly Disagree to 5=Strongly Agree). There were 6 items ( $\alpha = .74$ ) on the condom use subscale (e.g., “If I use condoms every time I have sex, I won’t enjoy having sex”), and 5 items ( $\alpha = .76$ ) on the delay subscale (e.g. “I’ll be doing what’s best for me if I don’t have sex until I’m older”).

### **2.4.5 Previous Sexual Experience**

All participants ( $n = 393$ ) were asked if they ever had sexual intercourse, to which they responded “yes” or “no”. Based on these responses, the sample was separated into two groups: “Sexually Experienced” ( $n = 246$ ) and “Sexually Inexperienced” ( $n = 147$ ).

### **2.4.6 Previous Condom Use**

Only those participants who reported being sexually experienced responded to the question, “When you have had vaginal sex in the past 90 days (3 months) how often did you use a condom?” This question was rated on a 5-point scale (1=Never to 5=Every Time). This

variable was dichotomized, such that a score of 5 represents “Consistent,” and any other score signifies “Inconsistent”.

## **2.5 Data Analysis Strategy**

Following the recommendations of Aiken & West (1991), I constructed hierarchical regression models to test main effects and interactions in the prediction of intentions to use condoms and intentions to delay engagement in sexual activity. This approach is consistent with extant research on interactions between constructs within the theory of planned behavior (Castanier et al., 2013; Conner & McMillan, 1999; Kothe & Mullan, 2014; Umeh & Patel, 2004).

The percentage of missing data among study variables ranged from 0% to 13%. Little’s MCAR test revealed that these data were missing completely at random,  $\chi^2(2627, N = 393) = 2816.30, p = .48$ . Possible explanations for missing data include survey fatigue or reluctance due to the sensitive nature of the questions. Using the multiple imputation procedure in SPSS 21, 20 data sets were created, allowing for analysis of a complete data set while accounting for uncertainty and bias (Graham, Olchowski, & Gilreath, 2007).

Because study variables were rated on different scales, the raw data were converted into standardized z scores. Predictor variables were then multiplied to create three interaction terms: PBC X perceived norms, PBC X attitude, and perceived norms X attitude (Aiken & West, 1991). Separate models were constructed to test each dependent variable (intentions for condom use and intentions to delay sexual activity), and the sample was separated into two groups (sexually experienced and sexually inexperienced), yielding a total of four regression models. In all models, age and gender were entered in the first step as covariates. For sexually experienced youth only, previous condom use was also entered in the first step of the condom use intentions



model. Perceived behavioral control, perceived norms, and attitude were entered in Step 2. The three interaction terms were entered in Step 3. Simple slope analyses were used to determine the nature of significant interactions, with the regression slope examined at high (one standard deviation above the mean) and low (one standard deviation below the mean) levels of the hypothesized moderator.

### 3 RESULTS

#### 3.1 Preliminary Analyses

Demographic data for all participants appear in Table 1. A considerably higher proportion of boys (75%) reported being sexually experienced than girls (55%),  $\chi^2(1, N = 393) = 15.19, p < .001$ . Sexually experienced youth were significantly older than their sexually inexperienced peers,  $t(391) = -5.13, p < .001$ .

Results of independent samples *t*-tests comparing groups on key study variables are presented in Table 2. Compared to sexually experienced youth, those with no sexual experience had significantly greater intentions to delay sexual activity. As expected, youth who were sexually experienced reported significantly higher PBC for condom use, but lower perceived behavioral control to delay sexual activity than youth who were inexperienced. Sexually experienced youth also reported lower perceived norms associated with delay and more negative attitudes about delaying sexual activity than youth who were not sexually experienced.

##### 3.1.1 Correlations

Correlations for all study variables are presented in Table 3. PBC, attitudes and perceived norms were positively associated with intentions to delay for both groups with condom use intentions only for the sexually experienced group. Among sexually inexperienced youth, perceived norms and attitudes were positively associated with condom use intentions; however,

perceived behavioral control was uncorrelated with condom use intentions. Previous condom use was positively correlated with age (older youth were more likely to use condoms inconsistently) and negatively correlated with all other study variables.

Gender and age were significantly associated with a number of study variables and were thus included as covariates in primary analyses. Specifically, girls in both groups reported greater perceived behavioral control, higher perceived norms, and more positive attitudes related to delay, and reported stronger intentions to delay sexual activity. However, girls in both groups also reported lower perceived behavioral control for using condoms, and sexually experienced girls reported more positive condom attitudes. Older participants in both groups reported greater perceived behavioral control for condom use. Older youth in the sexually experienced group reported less perceived norms, and weaker intentions to delay sexual activity.

**Table 2 Group differences on all study variables**

Study Variable	Group	<i>M</i>	<i>SD</i>	<i>t</i>
Condom PBC	Sexually Experienced	8.09	1.94	-4.73**
	Sexually Inexperienced	6.98	2.35	
Condom PN	Sexually Experienced	3.71	.71	.28
	Sexually Inexperienced	3.73	.71	
Condom Attitudes	Sexually Experienced	3.92	.65	-1.71
	Sexually Inexperienced	3.80	.68	
Delay PBC	Sexually Experienced	7.76	2.27	2.11*
	Sexually Inexperienced	8.26	2.25	
Delay PN	Sexually Experienced	3.46	.67	3.49**
	Sexually Inexperienced	3.72	.70	
Delay Attitudes	Sexually Experienced	3.56	.82	2.01*
	Sexually Inexperienced	3.73	.78	
Condom Intentions	Sexually Experienced	3.90	.98	1.45
	Sexually Inexperienced	4.05	.88	
Delay Intentions	Sexually Experienced	2.98	1.20	6.81**
	Sexually Inexperienced	3.81	1.05	

*Note.* PBC=Perceived Behavioral Control; PN = Perceived Norms. \* $p < .05$ , \*\* $p < .001$ . PBC was rated on a scale of 1 to 10; all other constructs rated on a scale of 1 to 5.

**Table 3 Correlations among all study variables**

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Age	-	-.30**	-	.43**	-.06	-.02	-.09	-.16	-.08	-.08	-.15
2. Gender	-.23**	-	-	-.31**	.11	.16	.46**	.19*	.33**	.16	.40**
3. Prev. Condom Use	.16*	-.09	-	-	-	-	-	-	-	-	-
4. Condom PBC	.23**	-.30**	-.15*	-	.20*	.09	.11	.08	-.10	.09	-.09
5. Condom PN	-.03	.04	-.26**	.32**	-	.64**	.19*	.73**	.49**	.62**	.35**
6. Condom Attitudes	-.06	.25**	-.14*	.14*	.64**	-	.22**	.44**	.68**	.50**	.28**
7. Delay PBC	-.01	.41**	-.14*	.24**	.28**	.29**	-	.25**	.33**	.15	.46**
8. Delay PN	-.16*	.18**	-.17*	.09	.61**	.43**	.27**	-	.58**	.48**	.51**
9. Delay Attitude	-.11	.33**	-.14*	.04	.43**	.64**	.39**	.63**	-	.35**	.51**
10. Condom Intentions	-.08	.08	-.28**	.25**	.66**	.53**	.20**	.42**	.27**	-	.40**
11. Delay Intentions	-.22**	.29**	-.26**	-.02	.25**	.25**	.31**	.55**	.41**	.36**	-

*Note.* PBC=Perceived Behavioral Control; PN=Perceived Norms; Correlations for sexually experienced youth appear below the diagonal; Correlations for sexually inexperienced youth appear above the diagonal; Previous condom use correlations are missing for sexually inexperienced youth because this question was not applicable for that group. \*  $p < .05$ , \*\*  $p < .01$ .

### 3.2 Primary Analyses

Results from hierarchical regression analyses are presented in Tables 4 and 5. When interaction effects did not reach significance, they were omitted from the final models.

#### 3.2.1 Intentions to Use Condoms

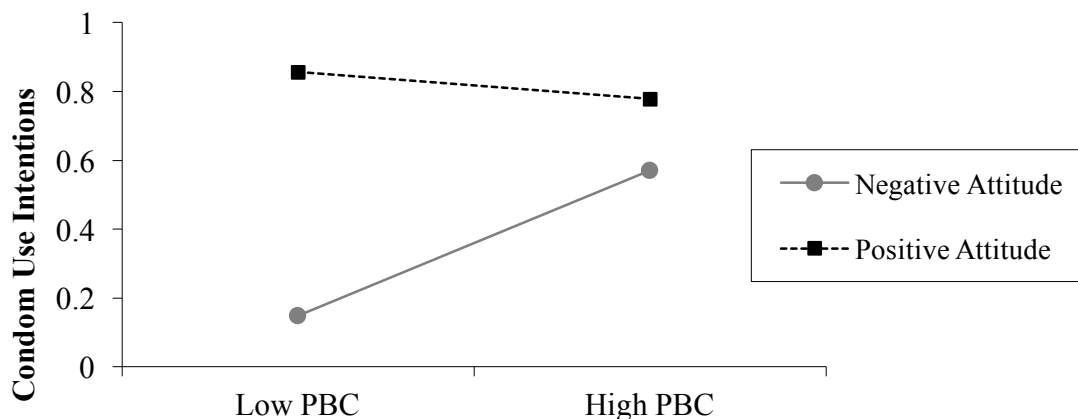
Overall, the models accounted for 49% of the variance in condom use intentions for sexually experienced youth, and 41% of the variance in condom use intentions for sexually inexperienced youth. Perceived norms were positively associated with condom use intentions for both study groups at Step 2 of the regression model. The interaction between perceived behavioral control and attitude was significant for sexually experienced youth. Further analysis of the regression slopes revealed that when attitudes about condom use were negative, sexually experienced adolescents who had higher perceived behavioral control were significantly more likely to report intentions to use condoms than those with lower perceived behavioral control,

$B = .21$ ,  $SE = .09$ ,  $t(238) = 2.38$ ,  $p = .02$ . However, when attitudes about condom use were positive, the association between PBC and condom use intentions was non-significant,  $B = -.04$ ,  $SE = .09$ ,  $t(238) = -.44$ ,  $p = .66$ . This interaction is illustrated in Figure 3.

**Table 4 Hierarchical regression models for intentions to use condoms**

	Sexually Experienced ( $n = 264$ )			Sexually Inexperienced ( $n = 147$ )	
	Step 1	Step 2	Step 3	Step 1	Step 2
	$B(SE)$	$B(SE)$	$B(SE)$	$B(SE)$	$B(SE)$
Age	-.02 (.05)	-.04 (.04)	-.04 (.04)	-.02 (.05)	-.01 (.05)
Gender	.10 (.13)	.02 (.11)	.02 (.11)	.33 (.18)	.16 (.16)
Condom	-.64 (.15)*	-.26 (.12)*	-.28 (.12)*		
PBC		.09 (.07)	.09 (.07)		.01 (.07)
PN		.50 (.07)*	.50 (.07)*		.46 (.10)*
ATT		.20 (.07)*	.22 (.07)*		.16 (.08)
PBC x ATT			-.13 (.06)*		
$R^2$	.08	.47*	.49*	.03	.41*
$\Delta R^2$		.39*	.02*		.38*

Note. PBC=Perceived Behavioral Control; PN = Perceived Norms; ATT=Attitudes. Condom=Previous Condom Use. \*  $p < .05$



**Figure 3 Perceived behavioral control (PBC) by attitude interaction predicting condom use intentions among sexually experienced youth**

### 3.2.2 Intentions to Delay Sexual Activity

Overall, the models accounted for 36% of the variance in delay intentions for sexually experienced youth, and 44% of the variance in delay intentions for sexually inexperienced youth. Perceived behavioral control and perceived norms were significant predictors of intentions to delay sexual activity for both study groups. Attitude was a significant contributor for sexually experienced youth only. There were no significant interactions associated with intentions to delay sexual activity.

**Table 5 Hierarchical regression models for intentions to delay sexual activity**

	Sexually Experienced ( <i>n</i> = 264)		Sexually Inexperienced ( <i>n</i> = 147)	
	Step 1 <i>B</i> ( <i>SE</i> )	Step 2 <i>B</i> ( <i>SE</i> )	Step 1 <i>B</i> ( <i>SE</i> )	Step 2 <i>B</i> ( <i>SE</i> )
Age	-.12 (.05)*	-.09 (.04)*	-.02 (.04)	-.01 (.04)
Gender	.51 (.12)*	.25 (.12)*	.76 (.16)*	.31 (.15)*
PBC		.12 (.06)*		.22 (.07)*
PN		.47 (.07)*		.26 (.08)*
ATT		.02 (.07)		.18 (.08)*
<i>R</i> <sup>2</sup>	.11*	.36*	.16*	.44*
$\Delta R^2$		.25*		.28*

Note. PBC=Perceived Behavioral Control; PN = Perceived Norms; ATT=Attitudes. \**p* < .05

## 4 DISCUSSION

The primary aim of this study was to assess the utility of the theory of planned behavior (TPB) in the context of adolescent sexual risk reduction. This study also sought to examine whether interactions among TPB constructs account for additional variance in intentions to use condoms or delay sexual activity compared to the original formulation of the theory that does not consider interactions. A third goal of this study was to test whether the TPB functions differently based on previous sexual experience. Addressing these questions is important because of the

potential implications for theory, research, and interventions that address adolescent sexual risk reduction.

The data partially support the hypothesis that perceived norms, perceived behavioral control, and attitude would be significantly associated with risk reduction intentions because there were main effects in some contexts, but not others. Only one interaction effect was detected, supporting the hypothesis that attitude would moderate perceived behavioral control. Overall, the data support the hypothesis that the utility of the TPB for predicting risk reduction intentions among adolescents depends on previous sexual experience and type of risk reduction behavior. This main finding is in accordance with Ajzen's (1991) postulation about the context-specific nature of the theory of planned behavior (i.e., there are contingencies impacting the effect of theory components on intentions). The following paragraphs detail the findings for each TPB construct with a discussion of implications for practice and future directions in research. This section ends with an overview of limitations and conclusions drawn from this study.

#### **4.1 Perceived Norms and Adolescent Sexual Decision Making**

Perceived norms were the only consistent predictor of intentions to use condoms and delay sexual activity for both sexually experienced and inexperienced youth. This finding partially contradicts observations that attitude and perceived behavioral control are the most robust determinants of intentions within the TPB (Ajzen, 1991, Albarracín et al., 2001), but supports literature that norms are particularly salient for adolescent sex related decision-making (Buhi & Goodson, 2007).

Previous experience is important to consider in respect to perceived norms. Consistent with previous research (Nahom et al., 2001), teens who had not engaged in sexual intercourse had higher perceptions of their peers supporting delayed sexual activity or abstaining from sex

until they are older compared to sexually experienced youth. Because peer groups are important to adolescent identity formation, this finding may reflect the tendency of teens to want to fit in with like-minded peers or act in a way similar to their peer group (Crosnoe & McNeely, 2008).

Whereas previous studies have used measures of either subjective norms (perceptions of whether others would endorse the behavior) or descriptive norms (perceptions of whether others actually perform the behavior), the measure of perceived norms in this study included both types, as suggested by Fishbein & Ajzen (2010). This is an asset for this study because the measure is inclusive. However, one avenue for future research and practice is to consider the differential influence of subjective norms and descriptive norms. For example, if youth are more strongly persuaded by perceptions of condom use among their peers (descriptive norms), then practitioners might consider social norms campaigns, which have been effective in other contexts of adolescent health behavior (Perkins, 2003). If subjective norms are more influential, interventions that include a youth-led component, such as the Leadership Council of the Teen Health Project, might engender more positive subjective norms (Sikkema et al., 2005).

#### **4.2 Volition and Perceived Behavioral Control**

Perceived behavioral control predicted positive intentions to delay sexual activity for both sexually experienced and inexperienced youth. This effect was not as straightforward for condom use. Among sexually inexperienced youth, perceived control for using condoms was not associated with intentions. Sexually inexperienced youth also had significantly less confidence in their ability to use condoms than their experienced counterparts. Lacking experience with sexual intercourse, and presumably actual condom use, the findings suggest that these youth may rely more heavily on peer influences to form intentions about using condoms.

Among experienced youth, the association of perceived behavioral control with condom use intentions depended on attitudes. The perceived behavioral control by attitude interaction supports the hypothesis that there are moderation effects between the TPB constructs, albeit the direction of the moderation was not as expected. It was anticipated that PBC would be effective only to the extent that attitudes about the behavior were positive. Instead, the evidence from this study indicates a ceiling effect for youth with positive attitudes about condom use. That is, perceived behavioral control may not contribute to condom use intentions if youth already feel that condom use is positive or beneficial. However, having a sense of confidence about the ability to use condoms can be helpful when youth have negative attitudes about condom use.

The extent to which the behavior is perceived as volitional may be underlying the differences in PBC's association with condom use and delay. Ajzen (1991, 2002) included the PBC variable in the theory of planned behavior to account for actions that are not completely under volitional control. Adolescents may perceive that delaying sexual activity is a behavior that is under volitional control, whereas condom use is not. For example, an individual may feel capable of delaying sexual activity because she is able to personally decide whether or not to pursue intercourse with another individual. Condom use, on the other hand, may be perceived as a shared behavioral decision between sexual partners rather than a personal one; therefore, an individual may lack a sense of control if she believes that performing behavior is dependent on someone else. An appropriate topic for future research would be to qualitatively explore how different sexual decisions are perceived in terms of volition. For practitioners, these findings highlight the importance of increasing adolescents' confidence in their ability not only to use condoms, but also to negotiate or insist upon using condoms with their sexual partners. The



differences suggest that inexperienced youth may especially benefit from interventions that include training on sexual assertiveness.

### **4.3 Attitudes**

Attitudes did not emerge as a stable predictor of intentions, as has been the case in research on other health-related behaviors (Albarracín, et al., 2001; Goldin & Kok, 1996). Looking at bivariate correlations, attitude and intentions were positively associated in both groups for both risk reduction behaviors. However, in the regression models, the main effect of attitude emerged only for the prediction of delay intentions among inexperienced youth. These findings suggest that, in most contexts, attitudes do not independently contribute to intentions and are thus shaped by other influences.

### **4.4 The Role of Previous Experience Among Sexually Experienced Youth**

This study also examined previous condom use consistency as a covariate in the model predicting condom use intentions among sexually experienced youth. Sixty-three percent of the sample reported having sexual experience, but one-fourth of this group reported that they had not used condoms consistently in the past. Findings indicate that the more risky youth have been with condom use in the past, the less likely they are to intend to reduce risk in the future. Previous condom use was also negatively associated with all other theory variables, and is thus important to consider in future research on adolescent sexual risk reduction. One suggestion is the inclusion of more comprehensive measures of previous sexual experience and behavior, including factors such as condom use frequency, age of debut, number of partners, and history of STIs or unplanned pregnancy (Salazar et al., 2010; Voisin et al., 2005). Using a more comprehensive measure might provide greater insight into how previous sexual experiences

shape adolescents' beliefs, and how these beliefs influence PBC, norm perceptions, attitudes and intentions.

## **4.5 Limitations**

### ***4.5.1 Methodological Considerations***

There are some limitations regarding the methods and measurement use in this study. This study assessed how cognitive processes (attitudes, beliefs, and self-evaluation) predicted another cognitive process (judgment of future behavior). The variance might be curtailed if we consider how cognitive processes predict actual behavior.

Although the theory of planned behavior constructs have been defined (Ajzen, 1991), the theory is widely applied to a variety of contexts and no standard measurement tool exists to assess the constructs. The items used to measure perceived norms, attitudes, and PBC vary from study to study. Thus, the findings from the current studies can be compared to similar studies only to a limited extent. Further, the measure of perceived behavioral control used in the current study primarily assesses self-efficacy, or confidence, which is only one aspect of the construct. By definition, perceived behavioral control also refers to an individual's perceived ability to execute a behavior taking into consideration obstacles and barriers.

Like many studies of sexual risk behavior, this study relied on adolescents' self-report. Although the survey was administered via computer and steps were taken to increase youth's sense of confidentiality, it is possible that some adolescents may have been influenced by social desirability or self-presentation bias. It is also possible that social desirability contributed to a restricted range of observations and reduced variances, thereby diminishing statistical power for detecting interaction effects (Ajzen, 2002; McClelland & Judd, 1993; Yzer, 2007). In addition, this study employed a cross-sectional methodology to establish correlates of sexual risk

reduction intentions, not necessarily causal determinants. This approach assumes that these proposed predictors are stable. Future research should consider longitudinal or prospective approaches to address the research question.

Further, this study was limited to a sample of predominantly African American youth who were associated with schools and community centers that provide sexual health services. Access to such services varies, and thus, the associations between TPB constructs and risk reduction intentions may be different for a broader sample of adolescents.

#### ***4.5.2 Ecological Considerations***

Another limitation of this study and, more generally, of the theory of planned behavior is a lack of consideration of ecological factors. Perceived norms addresses influences that are shaped by the environment. However, our understanding of this construct is filtered through the individual and analyses are conducted at the individual level. The fact that perceived norms are so influential indicates that ecological factors might have a more substantial role in shaping risk reduction intentions. It is possible that the TPB constructs are the mechanisms through which ecological factors (e.g. family, socioeconomic status, culture, media, religion, or access to health resources) affect adolescents' sexual risk reduction intentions or behaviors. For example, cultural beliefs about non-marital intercourse or media messages about condom use might shape beliefs or attitudes about sex, influence the ways adolescents perceive norms, or affect adolescents' confidence in reducing sexual risk. There are several factors that affect adolescents' of risk reduction intentions and behaviors (DiClemente et al., 2007). Ignoring or underestimating ecological factors in theory and research provides a limited understanding of adolescent sexual health and, furthermore, precludes efforts to conceptualize interventions that have sustained effects (DiClemente et al., 2007; Salazar et al., 2010).

## 4.6 Conclusion

The theory of planned behavior is a useful framework for understanding adolescent sexual risk reduction. TPB constructs explain a substantial proportion of variance in intentions to use condoms and delay sexual activity. However, as this study demonstrates, this linear formulation of the theory may be too simplistic. Perceived behavioral control, perceived norms, and attitudes are “residues of past experience” (Ajzen, 1991, p. 203). That is, previous sexual experiences shape adolescents’ beliefs and perceptions, which in turn affect intentions for future behavior. For researchers using the theory of planned behavior in this context, it is important to consider previous sexual experience and type of behavior. Youth with different levels of experience may have different learning needs and concerns regarding sexual risk reduction, but it is unclear to what extent existing intervention curricula address these differences.

More importantly, it is critical to understand how ecological factors influence attitude, norms, perceived behavioral control, and intentions for risk reduction behaviors among adolescents. It is well known that multiple factors influence adolescents’ intentions to reduce sexual risk. It is also well known that interventions that address multiple levels of influence (e.g. school, family, community) are successful in changing behavior and attitudes (Salazar et al., 2010; Sikkema et al., 2005). Thus, to the extent that the theory of planned behavior is useful in this context, our understanding of the theory would be enhanced by an integration of ecological influences. Ultimately, this understanding could engender conceptualizations of interventions that are maximally effective in creating sustained impact for adolescents.

## REFERENCES

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury park, CA: Sage.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior* (pp. 11-39). Heidelberg, Germany: Springer.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational and Human Decision Processes*, 50, 179-211. doi:10.1016/0749-5978(91)90020-T
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32 (4), 665-683.  
doi:10.1111/j.1559-1816.2002.tb00236.x
- Ajzen, I. (2011). The theory of planned behaviour: Reactions and reflections. *Psychology and Health*, 26 (1), 1113-1127. doi: 10.1080/08870446.2011.613995
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Albarracín, D. Johnson, B.T., Fishbein, M. & Muellerleile, P.A. (2001). Theories of reasoned action and planned behavior as models of condom use: A meta-analysis. *Psychological Bulletin*, 127 (1), 142-161. doi:10.1037/0033-2909.127.1.142
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology*, 40 (4), 471-499.  
doi:10.1348/014466601164939
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.

- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, Freeman.
- Buhi, E. R. & Goodson, P. (2007). Predictors of adolescent sexual behavior and intention: A theory-guided systematic review. *Journal of Adolescent Health, 40*, 4-21. doi: 10.1016/j.jadohealth.2006.09.027
- Carlson, D. L., McNutty, T.L., Bellair, P.E., & Watts, S. (2014). Neighborhoods and racial/ethnic disparities in adolescent sexual risk behavior. *Journal of Youth and Adolescence, 43*(9), 1536-1549. doi: 10.1007/s10964-013-0052-0
- Castanier, C., Deroche, T., & Woodman, T. (2013). Theory of planned behaviour and road violations: The moderating influence of perceived behavioural control. *Transportation Research Part F: Traffic Psychology and Behaviour, 18*, 148 –158. doi:10.1016/j.trf.2012.12.014
- Centers for Disease Control and Prevention. (2013a). *Compendium of Evidence-Based Interventions and Best Practices for HIV Preventions*. Retrieved from <http://www.cdc.gov/hiv/prevention/research/compendium/rr/teenhealth.html>.
- Centers for Disease Control and Prevention. (2013b). *Youth Risk Behavior Survey*. Retrieved from <http://www.cdc.gov/yrbs>
- Centers for Disease Control and Prevention. (2014a). *HIV Among Youth*. Retrieved from [http://www.cdc.gov/hiv/pdf/risk\\_youth\\_fact\\_sheet\\_final.pdf](http://www.cdc.gov/hiv/pdf/risk_youth_fact_sheet_final.pdf)
- Centers for Disease Control and Prevention. (2014b). *Sexually Transmitted Disease Surveillance 2013*. Retrieved from <http://www.cdc.gov/std/stats13/surv2013-print.pdf>
- Cheng, P. & Chu, M. (2014). Behavioral factors affecting students' intentions to enroll in

- business ethics courses: A comparison of the theory of planned behavior and social cognitive theory using self-identity as a moderator. *Journal of Business Ethics*, 124 (1), 35-46. doi:10.1007/s10551-013-1858-0
- Conner, M., & McMillan, B. (1999). Interaction effects in the theory of planned behaviour: Studying cannabis use. *British Journal of Social Psychology*, 38, 195-222.  
doi:10.1348/014466699164121
- Crosby, R.A., DiClemente, R.J., Salazar, L.F., Wingood, G.M., McDermott-Sales, J., Young, A.M., & Rose, E. (2013). Predictors of consistent condom use among young African American women. *AIDS and Behavior*, 17(13), 865-8710.  
doi:10.1007/s10461-011-9998-7
- Crosnoe, T. & McNeely, C. (2008). Peer relations, adolescent behavior, and public health research and practice. *Family Community Health: The Journal of Health Promotion & Maintenance*, 31, S71-S80. doi:10.1097/01.FCH.0000304020.05632.e8
- DiClemente, R. J., Brown, J. L., Sales, J. M., & Rose, E. S. (2013). Rate of decay in proportion of condom-protected sex acts among adolescents after participation in an HIV risk-reduction intervention. *Journal of Acquired Immune Deficiency Syndromes*, 63, S85-S89.  
doi:10.1097/QAI.0b013e3182920173
- DiClemente, R. J., Salazar, L. F., & Crosby, R. A. (2007). A review of STD/HIV preventive interventions for adolescents sustaining effects using an ecological approach. *Journal of Pediatric Psychology*, 32(8), 888-906. doi: 10.1093/jpepsy/jsmo56
- DiIorio, C., Dudley, W. N., Kelly, M., Soet, J. E., Mbwar, J., & Potter, J. S. (2001). Social

- cognitive correlates of sexual experience and condom use among 13- through 15-year-old adolescents. *Journal of Adolescent Health*, 29(3), 208-216. doi: 10.1016/S1054-139X(00)00200-7
- Eagly, A. H., & Chaiken, S. (1993). *Psychology of attitudes*. Fort Worth, TX: Harcourt Brace Jovanovich College Publishers.
- Ellis, R., Kosma, M., & Symons Downs, D. (2013). Moderators of youth exercise intention and behavior. *Health Education & Behavior*, 40, 305-301. doi:10.1177/1090198112441000
- Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. New York: Taylor & Francis.
- Graham, J. W., Olchowski, A. E., & Gilreath, T. D. (2007). How many imputations are really needed? Some practical clarifications of multiple imputation theory. *Prevention Science*, 8, 206-213. doi: 10.1007/s11121-007-0070-9
- Goldin, G. & Kok, G. (1996). The theory of planned behavior: a review of its applications to health-related behaviors. *American Journal of Health Promotion*, 11(2), 87-98.
- Høie, M., Moan, I., & Rise, J. (2010). An extended version of the theory of planned behaviour: Prediction of intentions to quit smoking using past behaviour as moderator. *Addiction Research and Theory*, 18 (5), 572-585. doi:10.3109/16066350903474386
- Jemmott, L. S. & Jemmott, J. B. (2007). Applying the theory of reasoned action to HIV risk-reduction behavioral interventions. In I. Ajzen, D. Albarracín, & R. Hornik (Eds.), *Prediction and change of health behavior: Applying the reasoned action approach* (pp. 243-263). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Kearney, M. S. & Levine, P.B. (2012). Why is the teen birth rate in the United States so high and why does it matter? *Journal of Economic Perspectives*, 26(2), 141- 166.



doi:10.1257/jep.26.2.141

Kidwell, B., & Jewell, R. (2003). The moderated influence of internal control: An examination across health-related behaviors. *Journal of Consumer Psychology, 13* (4), 377-386.

doi:10.1207/S15327663JCP1304\_05

Kost, K. and Henshaw, S. (2014) *U.S. teenage pregnancies, births and abortions, 2010: National and state trends by age, race and ethnicity*. Retrieved from

<http://www.guttmacher.org/pubs/USTPtrends10.pdf>

Kothe, E. J., & Mullan, B. A. (2014). Interaction effects in the theory of planned behaviour: Predicting fruit and vegetable consumption in three prospective cohorts. *British Journal of Health Psychology, 20*, 549-562. doi:10.1111/bjhp.12115

McClelland, G. H. & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin, 144*, 376-390. doi: 10.1037/0033-2909.114.2.376

Muñoz-Silva, A., Sánchez-García, M., Nunes, C., & Martins, A. (2007). Gender differences in condom use prediction with Theory of Reasoned Action and Planned Behaviour: The role of self-efficacy and control. *Aids Care, 19*(9), 1177-1181.

doi 10.1007/s12160-011-9266-0

Nahom, D., Wells, E., Gillmore, M. R., Hoppe, M., Morrison, D. M., Archibald, M., ... Graham, L. (2001). Differences by gender and sexual experience in adolescent sexual behavior: Implications for education and HIV prevention. *Journal of School Health, 71*(4), 153 – 158.

Perkins, W. (Ed.). (2003). *The Social Norms Approach to preventing school and college age*

- substance abuse: A handbook for educators, counselors, and clinicians*. San Francisco: Jossey-Bass.
- Pharo, H., Sim, C., Graham, M., Gross, J., & Hayne, H. (2011). Risky business: Executive function, personality, and reckless behavior during adolescence and emerging adulthood. *Behavioral Neuroscience*, *125*(6), 970-978. doi: 10.1037/a0025768
- Salazar, L. F., Bradley, E. L., Younge, S. N., Daluga, N. A., Crosby, R. A., Lange, D. L., & DiClemente, R. J., (2010). Applying ecological perspectives to adolescent sexual health in the United States: rhetoric or reality? *Health Education Research*, *25* (4), 552-562. doi: 10.1093/her/cyp065
- Santelli, J. S., Kaiser, J., Hirsch, L., Radosh, A., Simkin, L., & Middlestadt, S. (2004). Initiation of sexual intercourse among middle school adolescents: The influence of psychosocial factors. *Journal of Adolescent Health*, *34*, 200-208. doi:10.1016/j.jadohealth.2003.06.004
- Sikkema, K., Anderson, E., Kelly, J., Winett, R., Gore-Felton, C., Roffman, R., ... & Brondino, M. (2005). Outcomes of a randomized, controlled community-level HIV prevention intervention for adolescents in low-income housing developments. *AIDS*, *19*(14), 1509-1516. doi: 10.1097/01.aids.0000183128.39701.34
- Turner, C. F., Ku, L., Rogers, S. M., Lindberg, L. D., Pleck, J. H., & Sonenstein, F. L. (1998). Adolescent sexual behavior, drug use, and violence: Increased reporting with computer survey technology. *Science*, *280*, 867 – 873. doi:10.1126/science.280.5365.867
- Umeh, K. & Patel, R. (2004). Theory of planned behaviour and ecstasy use: An analysis of moderator-interactions. *British Journal of Health Psychology*, *9* (1), 25-38. doi:10.1348/135910704322778704

- Voisin, D. R., DiClemente, R. J., Salazar, L. F., Crosby, R. A., & Yarber, W. L. (2006). Ecological factors associated with STD risk behaviors among detained female adolescents. *Social Work, 51*(1), 71-79. doi: 10.1093/sw/51.1.71
- Watts, G. F., & Nagy, S. (2000). Sociodemographic factors, attitudes, and expectations toward adolescent coitus. *American Journal of Health Behavior, 24*(4), 309 – 317.
- Yzer, M. (2007). Does perceived control moderate attitudinal and normative effects on intention?: A review of conceptual and methodological issues In I. Ajzen, D. Albarracín, & R. Hornik (Eds.), *Prediction and change of health behavior: Applying the reasoned action approach* (pp. 111-128). Mahwah, NJ: Lawrence Erlbaum Associates.

## APPENDICES

### Appendix A Selected Survey Items

#### Risk Reduction Intentions

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>Condom use</b>					
1. In the next few months, I will not have sex unless I use a condom.	1	2	3	4	5
2. In the next few months, I'll make sure I have condoms anytime I think I might have sex.	1	2	3	4	5
<b>Delay</b>					
1. In the next few months, I will not have sex.	1	2	3	4	5
2. I won't have sex in the next few months because I want to wait until I am older.	1	2	3	4	5

#### Perceived Behavioral Control

	Very Sure I Cannot			Somewhat Sure I Can			Very Sure I Can			
<b>Condom</b>										
1. How sure are you that you can you put on a condom correctly?	1	2	3	4	5	6	7	8	9	10
2. How sure are you that you can use a condom every time you have sex?	1	2	3	4	5	6	7	8	9	10
3. How sure are you that you can keep condoms with you for use whenever you might need them?	1	2	3	4	5	6	7	8	9	10
4. How sure are you that you can you take a condom off correctly?	1	2	3	4	5	6	7	8	9	10
<b>Delay</b>										
1. How sure are you that you can stay away from situations that would lead to sexual intercourse?	1	2	3	4	5	6	7	8	9	10
2. How sure are you that you can wait until you are older to have sexual intercourse?	1	2	3	4	5	6	7	8	9	10
3. When someone tries to talk you into having sex, how sure are you that you can say no?	1	2	3	4	5	6	7	8	9	10
4. How sure are you that you can you get up and leave a situation that would lead to sexual intercourse?	1	2	3	4	5	6	7	8	9	10

**Perceived Norms**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>Condom Use</b>					
1. If I tell my boyfriend or girlfriend that I'm going to use condoms every time I have sex, they'll agree this is best for me.	1	2	3	4	5
2. If I tell my friends in THP that I'm going to use condoms every time I have sex, they'll agree this is best for me.	1	2	3	4	5
3. My boyfriend or girlfriend believes you should always use a condom during sex.	1	2	3	4	5
4. My friends in THP believe you should always use condoms during sex.	1	2	3	4	5
5. My boyfriend or girlfriend always uses condoms during sexual intercourse.	1	2	3	4	5
6. My friends in THP always use condoms during sexual intercourse.	1	2	3	4	5

**Delay**

1. If I tell my boyfriend or girlfriend that I'm going to wait to have sex, they will agree this is best for me.	1	2	3	4	5
2. If I tell my friends in THP that I'm going to wait to have sex, they will agree this is best for me.	1	2	3	4	5
3. My boyfriend or girlfriend thinks it is okay or even good to wait until you're older to have sexual intercourse.					
4. My friends in THP think it is okay or even good to wait until you're older to have sexual intercourse.	1	2	3	4	5
5. My boyfriend or girlfriend is waiting to have sexual intercourse.	1	2	3	4	5
6. My friends in THP are waiting to have sexual intercourse.	1	2	3	4	5

**Attitude**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>Condom use</b>					
1. If I use condoms every time I have sex, I won't like having sex (recoded prior to analysis)	1	2	3	4	5
2. I'll be safe from HIV and AIDS, if I use condoms every time I have sex.	1	2	3	4	5

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
3. If I tell my friends that I'm going to use condoms every time I have sex, I know I'll be doing the right thing.	1	2	3	4	5
4. I'll be doing what is best for me, if I use condoms every time I have sex.	1	2	3	4	5
5. I'll know I am doing the right thing, if I tell my boyfriend or girlfriend that I'm going to use condoms every time I have sex.	1	2	3	4	5
6. If I tell my boyfriend or girlfriend that I'm going to use condoms every time I have sex, our relationship will be stronger.	1	2	3	4	5

### Delay

1. I'll be safe from HIV and AIDS if I wait until I'm older to have sex.	1	2	3	4	5
2. If I tell my friends that I'm going to wait until I'm older to have sex, I know I'll be doing the right thing.	1	2	3	4	5
3. I'll be doing what is best for me, if I don't have sex until I'm older.	1	2	3	4	5
4. I'll know I am doing the right thing, if I tell my boyfriend or girlfriend that I'm going to wait to have sex.	1	2	3	4	5
5. If I tell my boyfriend or girlfriend that I'm going to wait to have sex, our relationship will be stronger.	1	2	3	4	5

### Previous Sexual Behavior and Consistent Condom Use

1. Have you ever had sexual intercourse? By this, we mean sex with penetration, or "doin' it."

1 = yes

2 = no

\* The following question was displayed *only* if participant answered, "yes" to the previous question

2. When you had vaginal intercourse in the past 3 months (90 days), how often did you use a condom?

1 = Never

2 = Almost Never

3 = Sometimes

4 = Almost Every Time

5 = Every Time