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Intention to Use Novel Methods of Male Directed Contraception Among College Students

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Abstract

Purpose: Currently, men have two choices for contraception: the male condom and vasectomy. Male condoms have limited user efficacy, and vasectomies are not easily reversible. To supplement vasectomy and condom use, the World Health Organization has backed the urgent development of male-directed contraception (MDC). Using the Theory of Planned Behavior (TPB), this study was guided by the following aims: (1) describe college men's attitudes, subjective norms, and perceived behavioral control towards male birth control methods and (2) determine if the following factors are associated with intention to use MDC methods: masculinity, attitudes, subjective norms, and perceived behavior control.

Methods: This study used a cross-sectional design. Data were collected online, via email, from male college students at one Midwestern University.

Results: Attitudes, subjective norms, and perceived behavioral control were statistically significant predictors of intention to use a male hormonal pill, transdermal gel, and hormonal injection. Attitudes and subjective norms were also found to be associated with intention to use a male birth control implant.

Conclusion: These results suggest the TPB may be a suitable theory for further investigation into the intended use of MDC. Attitudes and subjective norms accounted for the most variability in intention to use MDC. Future research should therefore investigate specific attitudes and subjective norms that influence the intention to use developmental methods of MDC. Future research should also consider additional theoretical models, such as the Health Belief Model, to continue investigating intention to use developmental methods of MDC.

Introduction

As one of the ten great public health achievements of the 20th century (Centers for Disease Control and Prevention [CDC], 1999), family planning allows individuals to achieve a desired family size and spacing between births while also contributing to improved health outcomes for infants, children, women, and families (CDC, 1999; Gipson, Koenig, & Hindin, 2008; Sonfield, Hasstedt, & Gold, 2014). Family planning includes a

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multitude of services such as sexually transmitted infection (STI) and human immunodeficiency virus (HIV) prevention education, reproductive health services, pregnancy testing, and contraceptive services (Gavin et al., 2014; Gavin & Pazol, 2016; Guttmacher Institute, 2014). In 2015, 1.9 million unintended pregnancies were prevented by publicly funded family planning services. Moreover, federal and state governments saved on average $7.09 for every public dollar spent on family planning (Frost et al., 2017; Sonfield et al., 2014).

Despite the marked effects of family planning services, unintended pregnancies, or pregnancies that are unwanted or mistimed, account for 45 percent of all pregnancies in the United States with the highest rates of unintended pregnancy occurring among women aged 18-24 (Finer & Zolna, 2016). For individuals who are sexually active, correct and consistent contraceptive use can be highly effective at preventing unintended pregnancy; however, only 52 percent of sexually active college students used a method of contraception during their last vaginal intercourse (American College Health Association [ACHA], 2017). These data suggest use of pregnancy prevention methods, specifically in college students, are inadequate.

Currently, men have two choices for contraception: the male condom and vasectomy. Male condoms, however, have limited user efficacy, and vasectomies are not easily reversible (Contraceptive Use in the United States, 2015). To supplement vasectomy and condom use, the World Health Organization (WHO) has backed the urgent development of male-directed contraception (MDC; WHO, 2010). Multiple methods of MDC are under development including oral pills, gels, injections, and implants (Nieschlag, 2010). Multiple publications have found the majority of men would be willing to use or try a method of MDC (Amory, Page, Anawalt, Matsumoto, & Bremner, 2007; Dismore, Van Wersch, & Swainston, 2016; Heinemann, Saad, Wiesemes, White, & Heinemann, 2005; Meriggiola et al., 2006; Walker, 2011; Weston, Schlipalius, Bhuinneain, & Vollenhoven, 2002). Despite high acceptability of MDC generally, research shows acceptability among college students is low. In a study of college men, over 60 percent of respondents reported low to no willingness to use MDC (Peterson, Campbell, & Lacky, 2019). Given the highest rates of unintended pregnancy occur among adults aged 18-24 (Finer and Henshaw, 2006), investigating acceptability of MDC in this age group is critical to meeting the Healthy People 2030 objectives.

Masculinity

Gender norms, a cultural-environmental level factor, are a result of socialization (West & Zimmermin, 1987) enacted by repeated behaviors, actions, and interactions (Connell, 1995; West & Zimmerman, 1987). Gender encompasses the select characteristics of femaleness and maleness (Boles & Hoeveler, 2004). Masculinity for example, is a result of the socially identified behaviors, beliefs, feelings, values, and cognitions of male identity (Knight et al., 2012; Rothgerber, 2013; Wester & Vogel, 2012). Gender norms have been identified as a modifying factor of attitudes towards MDC, although results in the literature are conflicting. Some scholars have identified gender norms, links to femininity or associations of masculinity, as barriers of willingness to use MDC (Peterson et al., 2019; Walker, 2011; Zhang et al., 2006). Qualitative researchers, however, found men would be willing to use male birth control pills as they represent contraceptive responsibility (Dismore et al., 2016). Contraceptive responsibility is portrayed as a significant act of masculine valor (Terry & Braun, 2012), and thus, an engagement of masculinity. Given the inconsistency of the literature, it is necessary to investigate the relationship between masculinity and factors associated with willingness to use MDC.

Theoretical Framework

One of the most extensively used theories exploring social and health behaviors, the Theory of Planned Behavior (TPB) posits the likelihood of performing a specific behavior is determined by individual motivational factors including: attitudes towards performing the behavior, subjective norms associated with the behavior, and perceived control over the behavior (Glanz,

Rimer, & Viswanath, 2008). Attitudes are an individual's beliefs about what will happen if the behavior is performed and their judgment of the expected outcome. Subjective norms are an individual's beliefs about what other people think about the behavior and their motivation to conform to the perceived norms. Perceived control is an individual's beliefs about the factors associated with performing the behavior and the amount of perceived control they have over performing the behavior (Edberg, 2019).

As the only available male contraceptive method, understanding condom use intentions may provide the best tentative understanding of MDC intention. Previous meta-analyses have found all TPB constructs to have moderate to strong associations with behavior (Cooke, Dahdah, Norman, & French, 2016; McDermott et al., 2015; McEachan et al., 2011; Riebel et al. 2015; Starfelt & White, 2016). When comparing the predictive validity of three socio-cognitive models, the TPB was found to best predict the frequency of condom use compared to the socio-cognitive model and the information-motivation-behavioral skills model (Espada, Morales, Guillén-Riquelme, Ballester, & Orgilés, 2015). A meta-analysis using the TPB and Theory of Reasoned Action as models for condom use concluded attitudes are the best predictor of condom use intention (Albarracin, Johnson, Fishbein, & Muellerleile, 2001). Reid and Aiken found similar results with attitudes providing associations with intended condom use (2011). Among college students specifically, attitudes, subjective norms, and perceived behavioral control accounted for 64 percent of the variance in condom use intention with perceived behavioral control accounting for 35 percent of the variance in condom use behavior (Asare, 2015). Furthermore, there are potential differences in condom use intentions based on gender and sexual experience. In a separate study on the role of gender and sexual experience in predicting condom use intentions, results demonstrated that among the TPB constructs, attitudes towards condom use were the most significant predictor of condom use intentions among sexually inexperienced participants. Attitudes and subjective norms towards condom use were the most significant predictors of condom use intentions among sexually

experienced participants (Rich, Mullan, Sainsbury, & Kuczmierczyk, 2014). The TPB, with an added masculinity construct, was used to guide this study.

Purpose

Currently, MDC use is a hypothetical behavior; however, the use of MDC can be assessed indirectly by understanding intended use. Intended use is regarded as an indirect measure of MDC's acceptability which is influenced by numerous factors including cost, availability, accessibility, and attitudes (Glasier, 2010). Considering the inconsistent use of contraceptive methods among college students and the lack of feasibility of vasectomies for young adult men, there is a need to understand factors related to the potential use of innovative MDC methods to prevent unintended pregnancies. Therefore, the purpose of this study was to determine factors related to intention to use MDC methods among college students. Using the TPB, this study was guided by the following aims:

1. Describe college men's attitudes, subjective norm, and perceived behavioral control towards male birth control methods.
2. Determine if the following factors are associated with intention to use MDC methods: masculinity, attitudes, subjective norms, and perceived behavior control.

Methods

Participants

This study's priority population was college students enrolled in a Midwestern university. Inclusion criteria for this study required participants to be: 1) aged 18 years or older; 2), fluent in English, and 3) available for contact via a valid university email address. One hundred and five (n = 105) college men completed the survey. A sample size of at least 43 was needed to determine small effect sizes (Soper, 2017).

Table 1. Participant Characteristics *(N = 105)*

Variable	n	%
Age		
18-24	80	76.2
25-31	10	9.5
32-38	4	3.8
39-45	6	5.7
46+	5	4.8
Race		
White	98	83.1
African American	8	6.8
Asian	6	5.1
Multi-Racial	5	4.2
Other	1	0.8
Relationship Status		
Single and not in a monogamous relationship	59	53.2
Single, but in a monogamous relationship	34	30.6
Married	18	16.2
Religion		
Non-Denominational Christian	35	29.7
Agnostic	24	20.3
Catholic	19	16.1
Other	11	9.3
Protestant	10	8.5
Atheist	10	8.5
Islamic	4	3.4
Jewish	2	1.7
Buddhist	2	1.7
Hindu	1	0.8
Sexual Orientation		
Straight/Heterosexual	97	82.9
Asexual	9	7.7
Bisexual	4	3.4
Gay	3	2.6
Pansexual	2	1.7
Questioning	1	.9
Insurance		
Parent's Policy	77	65.3
Individually Purchased Policy	14	11.9
School Policy	13	11.0
Government Policy	7	5.9
None	4	3.4
Military Policy	3	2.5

NOTE: Differences in counts the result of missing values.

Procedures

Prior to beginning data collection, this study was reviewed and approved by the University of Cincinnati Institutional Review Board (IRB) (IRB 2019-0916). All data collection occurred through Qualtrics in the Fall of 2019. Participant emails were provided by university administrators. Prospective participants received the study's recruitment emails and consent form online. Those agreeing to participate clicked a button to advance and complete the study survey.

Instrumentation

Measures. The instrument included 6 demographic and descriptive items to characterize the sample. Participants were asked to report: age, race/ethnicity, relationship status, religion, sexual orientation, and primary source of health insurance.

Masculinity. Masculinity was measured by six items modified from the Traditional Masculinity-Femininity Scale (TMF) developed by Kachel and colleagues (Kachel, Steffens, & Niedlich, 2016). TMF utilizes six independent items on a 7-point scale with masculinity and femininity as two unipolar dimensions (Kachel, et al., 2016). For the purposes of this study, the 7-point scale was modified with "not at all masculine" and "totally masculine" as endpoints for male respondents. The possible construct score ranged from 6-42 with higher scores indicating participants viewing themselves as being more masculine.

Attitude. Attitude was operationally defined as an individual's general feeling of like or dislike toward each MDC method. Attitude towards each MDC method was measured using seven 7-point semantic differential scale items based on bipolar adjectives (Francis et al., 2004). The stem statement for these items was, "To prevent pregnancy, I think a (contraceptive pill, contraceptive gel, injectable contraceptive, or IVD) for men would be." End points included, irresponsible-responsible, unacceptable-acceptable, unhealthy-healthy, disadvantages-advantageous, undesirable-desirable, ineffective-effective, and unsafe-safe with a possible construct score range of 7-49. Higher scores indicated more positive attitudes towards each contraceptive method. In our sample, the attitude construct exhibited a Cronbach's alpha of 0.94, 0.95, 0.93, and 0.94 for a contraceptive pill, transdermal gel, injection, and implant respectively (Table 2).

Subjective norm. Subjective norm was defined as an individual's general belief about what significant people in their lives think about MDC. Subjective norms towards each MDC method were measured using seven items.

Table 2. *Theory of Planned Behavior Construct Descriptive Statistics*

Construct	Possible Range	Observed Range	M	SD	Cronbach's α
Pill					
Behavioral Intention	3-21	3-21	13.24	5.85	.97
Attitude Toward the behavior	7-49	7-49	37.53	11.05	.94
Subjective Norm	7-49	7-49	27.65	10.23	.93
Perceived Behavioral Control	2-14	2-14	11.19	2.42	.36
Gel					
Behavioral Intention	3-21	3-21	11.78	5.95	.97
Attitude Toward the behavior	7-49	7-49	37.88	11.69	.95
Subjective Norm	7-49	7-49	26.22	10.37	.96
Perceived Behavioral Control	2-14	2-14	10.76	3.09	.57
Injection					
Behavioral Intention	3-21	3-21	9.90	6.08	.98
Attitude Toward the behavior	7-49	7-49	32.55	11.67	.93
Subjective Norm	7-49	7-49	24.32	10.554	.95
Perceived Behavioral Control	2-14	2-14	9.85	3.00	.46
Intra Vas Device					
Behavioral Intention	3-21	3-21	9.13	5.88	.98
Attitude Toward the behavior	7-49	7-49	38.48	11.43	.94
Subjective Norm	7-49	7-49	23.26	10.79	.97
Perceived Behavioral Control	2-14	2-14	9.56	3.21	.49

Participants were asked, "If it were available to prevent pregnancy, people who are important to me think that I should use a (contraceptive pill, contraceptive gel, injectable contraceptive, or implant) for men", "If it were available to prevent pregnancy, my parent(s) or legal guardian(s) would like me to use a (contraceptive pill, contraceptive gel, injectable contraceptive, or implant) for men", "If it were available to prevent pregnancy, family members other than my parent(s) or legal guardians(s) (for example, sibling, aunt, uncle, grandparent, etc.) would like me to use a (contraceptive pill, contraceptive gel, injectable contraceptive, or implant) for men", "If it were available to prevent pregnancy, my friends would like me to use a (contraceptive pill, contraceptive gel, injectable contraceptive, or implant) for men", "If it were available to prevent pregnancy, my sexual partner(s) would like me to use a (contraceptive pill, contraceptive gel, injectable contraceptive, or implant) for men", "If it were available to prevent pregnancy, my religious leader(s) would like me to use a (contraceptive pill, contraceptive gel, injectable contraceptive, or implant) for men", and "If it were available to prevent pregnancy, my healthcare provider(s) (e.g., doctor, nurse) would like me to use a (contraceptive pill, contraceptive gel, injectable contraceptive, or IVD) for men". Each item was measured using a 7-point Likert-type scale with strongly disagree and strongly agree endpoints with a possible construct sore range of 7-49. Higher scores indicated more positive subjective norms towards each contraceptive method. In our sample, the subjective norm construct exhibited a Cronbach's alpha of 0.93, 0.96, 0.95, and 0.97 for a contraceptive pill, transdermal gel, injection, and implant respectively (Table 2).

Perceived behavioral control. Perceived behavioral control (PBC) was operationally defined as the extent to which people believe they are in control of using the MDC method. PBC towards each method of MDC was measured by two items. Participants were asked, "I am confident I can use a male (contraceptive pill, contraceptive gel, injectable contraceptive, or IVD)" and "If it were commercially available, I intend to use a male (contraceptive pill, contraceptive gel, injectable contraceptive, or IVD)". Each item was measured using a 7-point Likert-type scale with strongly disagree and strongly agree endpoints with a possible construct sore range of 2-14. Perceived behavioral control was the only construct to fall below a priori Cronbach alpha level of .92 for the male pill (α = .36), contraceptive gel (α = .57), contraceptive injection (α = .46), and implant (α = .49) (Table 2).

Behavioral intention. Behavioral intention was operatically defined as college men's intention to use MDC. Behavioral intention towards each MDC method was measured by three items. Participants were asked, "If it were commercially available, I intend to use a male (contraceptive pill, contraceptive gel, injectable contraceptive, or IVD)", "If it were commercially available, I want to use a male (contraceptive pill, contraceptive gel, injectable contraceptive, or IVD)", and "If it were commercially available, I would try to use a male (contraceptive pill, contraceptive gel, injectable contraceptive, or IVD)". Each item was measured using a 7-point Likert-type scale with strongly disagree and strongly agree endpoints with a possible construct sore range of 3-21. Higher scores indicated more positive intentions towards using each contraceptive method. In our sample, the intention construct exhibited a Cronbach's alpha of 0.97, 0.97, 0.98, and 0.98 for a contraceptive pill, transdermal gel, injection, and implant respectively (Table 2).

Data Analysis

Data were analyzed using International Business Machines (IBM®) Statistical Package for Social Sciences (SPSS) version 24 (IBM, Armonk, NY). Descriptive statistics were used to describe participant characteristics. Cronbach's alpha was used to assess internal consistency of TPB construct items. Four separate liner regressions analysis models, one for each dependent variable, were conducted to determine the factors associated with intention to use male birth control. An alpha of <.05 was set as the criteria to determine statistical significance. Beta weights and structure coefficients were analyzed to determine which variables contributed the most to each model's effect.

Results

Participant Characteristics

The sample was predominantly between the ages of 18 and 24 (n = 80, 76.2%), white (n = 98, 83.1%), and identified as straight or heterosexual (n = 97, 82.9%). Most participants (n = 77,

65.3%) were on their parent's insurance policy and identified as non-denominational Christian (n = 35, 29.7%), agnostic (n = 24, 20.3%), or Catholic (n = 19, 16.1%). Over half of the sample (n = 59, 53.3%) reported being single and not in a monogamous relationship. Additional characteristics of the sample can be found in Table 1.

Behavioral Intention to use Male Directed Contraception

Behavioral intention scores to use all four methods of MDC were low. Behavioral intention to use a male birth control pill (M = 13.24; SD = 5.85) and a transdermal birth control gel (M = 11.78; SD = 5.95) had the highest mean scores. Behavioral intention to use a male birth control injection (M = 9.90; SD = 6.08) and a male birth control implant (M = 9.13; SD = 5.88) had the lowest mean intention scores of all four methods.

Behavioral Intention to use a Male Contraceptive Pill

Multiple linear regression was used to run five models for predicting male college students' intention to use male hormonal birth control pills. For the first model, only demographic variables were entered. The first model was not statistically significant. The second model included all demographic variables and the TPB construct attitude towards a male hormonal birth control pill. The second model was statistically significant and accounted for 39 percent of the variance (F [17, 75] = 2.86, p = 0.001, R2 = 0.39). The third model included all demographic variables and the TPB constructs attitude towards a male hormonal birth control pill and subjective norms. The third model was statistically significant and accounted for 54 percent of the variance (F [18, 74] = 4.73, p = 001, R2 = 0.54). The fourth model included all demographic variables and the TPB constructs attitude towards a male hormonal birth control pill, subjective norms, and perceived behavioral control. The fourth model was statistically significant and accounted for 58.8% of the variance (F [19, 73] 5.48, p = 001, R2 = 0.59). The final model included all demographic variables, all TPB

constructs, and an added masculinity variable. The final model was statistically significant and accounted for 59 percent of the variance (F [20, 72] = 5.14, p = 001, R2 = 0.59). In the final model, intention to use a male hormonal birth control pill was predicted by male college students': attitudes (β = .24, p = 0.027), subjective norms (β = .43, p = 0.001), and perceived behavioral control (β = .27, p = 0.003). In assessing the squared structure coefficients, attitudes, subjective-norms, and PCB accounted for 62 percent, 85 percent, and 44 percent, respectively, of the effect in the final model. Regression weights, structure coefficients, and confidence intervals are shown in Table 3.

Behavioral Intention to use a Male Contraceptive Transdermal Gel

Multiple linear regression was used to run five models for predicting male college students' intention to use male hormonal birth control gel. For the first model, only demographic variables were entered. The first model was not statistically significant. The second model included all demographic variables and the TPB construct attitude towards a male hormonal birth control gel. The second model was statistically significant and accounted for 45 percent of the variance (F [17, 79] = 3.85, p = .001, R2 = 0.45). The third model included all demographic variables and the TPB constructs attitude towards a male hormonal birth control gel and subjective norms. The third model was statistically significant and accounted for 60 percent of the variance (F [18, 78] = 6.40, p = 0.001, R2 = 0.60). The fourth model included all demographic variables and the TPB constructs attitude towards a male hormonal birth control gel, subjective norms, and perceived behavioral control. The fourth model was statistically significant and accounted for 64 percent of the variance (F [19, 77] = 7.13, p = 0.001, R2 = 0.64). The final model included all demographic variables, all TPB constructs, and an added masculinity variable. The final model was statistically significant and accounted for 64 percent of the variance (F [20, 76] = 6.72, p = 0.001, R2 = 0.64). In the final model, intention to use a male hormonal birth control gel was predicted by male college

students': attitudes (β = .30, p = 0.003), subjective norms (β = .41, p = 0.001), and perceived behavioral control (β = .26, p = 0.004). In assessing the squared structure coefficients, attitudes, subjective-norms, and PCB accounted for 66 percent, 79 percent, and 53 percent, respectively, of the effect in the final model. Regression weights, structure coefficients, and confidence intervals are shown in Table 4.

Behavioral Intention to use a Male Contraceptive Injection

Multiple linear regression was used to run five models for predicting male college students' intention to use male hormonal birth control injection. For the first model, only demographic variables were entered. The first model was not statistically significant. The second model included all demographic variables and the TPB construct attitude towards a male hormonal birth control injection. The second model was statistically significant and accounted for 49 percent of the variance (F [17, 77] = 4.48, p = 0.001, R2 = 0.49). The third model included all demographic variables and the TPB constructs attitude towards a male hormonal birth control injection and subjective norms. The third model was statistically significant and accounted for 70 percent of the variance (F [18, 76] = 10.05, p = 0.001, R2 = 0.70). The fourth model was statistically significant and accounted for 71 percent of the variance (F [19, 75] = 10.09, p = 0.001, R2 = 0.71). In the fourth model, intention to use a male hormonal birth control injection was positively predicted by male college students': attitudes (β = .24, p = 0.006), and subjective norms (β = .49, p = 0.001). The final model included all demographic variables, all TPB constructs, and an added masculinity variable. The final model was statistically significant and accounted for 72 percent of the variance (F [20, 74] = 9.50, p = 0.001, R2 = 0.72). In the final model, intention to use a male hormonal birth control injection was positively predicted by male college students': attitudes (β = .24, p = 0.006), subjective norms (β = .50, p = 0.001), and perceived behavioral control (β = .17, p = 0.049). Intention to use a male hormonal birth control injection was negatively predicted by male

Table 3. *Behavioral Intention to use a Male Hormonal Birth Control Pill*

Predictor	M1 B	M1 r_s^2	M1 β	M1 95% CI	M2 B	M2 r_s^2	M2 β	M2 95% CI	M3 B	M3 r_s^2	M3 β	M3 95% CI	M4 B	M4 r_s^2	M4 β	M4 95% CI	M5 B	M5 r_s^2	M5 B	M5 95% CI
Model	Model 1 $R^2=.19$ $F=1.14$				Model 2 $R^2=.39$ $F=2.86$				Model 3 $R^2=.54$ $F=4.73$				Model 4 $R^2=.59$ $F=5.48$				Model 5 $R^2=.59$ $F=5.14$			
Age	.08	0.11	.11	[-.21, .37]	.06	0.05	.08	[-.19, .31]	.10	0.04	.14	[-.13, .32]	.03	0.04	.04	[-.18, .25]	.03	0.04	.04	[-.19, .25]
Race/Ethnicity [a]																				
White	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Non-White	-2.12	0.03	-.13	[-6.28, 2.05]	-2.38	0.01	-.14	[-6.01, 1.26]	-.50	0.01	-.03	[-3.80, 2.80]	-.37	0.01	-.02	[-3.50, 2.76]	-.39	0.01	-.02	[-3.55, 2.76]
Relationship Status [b]																				
Single, not in a monogamous relationship	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Single, in a monogamous relationship	1.60	0.07	.12	[-1.43, 4.63]	.69	0.04	.05	[-1.98, 3.36]	.34	0.03	.03	[-2.02, 2.70]	.49	0.03	.04	[-1.75, 2.73]	.49	0.03	.04	[-1.76, 2.75]
Married	1.19	0.02	.07	[-6.48, 8.87]	-.72	0.01	-.04	[-7.46, 6.03]	.49	0.01	.03	[-5.48, 6.46]	.94	0.01	.06	[-4.73, 6.61]	.97	0.01	.06	[-4.74, 6.68]
Religion [c]																				
Non-denominational Christian	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Catholic	-1.98	0.02	-.13	[-5.71, 1.75]	-.63	0.01	-.04	[-3.93, 2.68]	.76	0.01	.05	[-2.21, 3.73]	.85	0.01	.05	[-1.96, 3.67]	.87	0.01	.06	[-1.97, 3.70]
Protestant	-2.64	0.15	-.12	[-7.31, 2.02]	-.36	0.07	-.02	[-4.53, 3.82]	-.75	0.06	-.04	[-4.44, 2.94]	-1.11	0.05	-.05	[-4.61, 2.40]	-1.10	0.05	-.05	[-4.63, 2.43]
Hindu	9.90	0.06	.17	[-2.66, 22.45]	6.36	0.03	.11	[-4.70, 17.412]	5.22	0.02	.09	[-4.54, 14.99]	6.00	0.02	.10	[-3.27, 15.27]	6.12	0.02	.11	[-3.24, 15.49]
Buddhist	4.72	0.01	.08	[-8.72 18.16]	6.33	0.00	.11	[-5.43, 18.09]	1.63	0.00	.03	[-8.93, 12.18]	-.03	0.00	.00	[-10.09, 10.04]	.03	0.00	.00	[-10.11, 10.16]
Islamic	-.66	0.05	-.02	[-9.38, 8.06]	4.57	0.03	.14	[-3.34, 12.47]	1.78	0.02	.05	[-5.29, 8.85]	1.96	0.02	.06	[-4.74, 8.66]	2.00	0.02	.06	[-4.75, 8.75]
Atheist	1.04	0.01	.05	[-3.56, 5.64]	-1.59	0.00	-.08	[-5.74, 2.56]	-.19	0.00	-.01	[-3.90, 3.52]	-.09	0.00	-.01	[-3.61, 3.42]	.02	0.00	.00	[-3.60, 3.65]
Agnostic	2.59	0.15	.17	[-1.07, 6.26]	.45	0.07	.03	[-2.86, 3.77]	1.07	0.05	.07	[-1.87, 4.00]	.90	0.05	.06	[-1.88, 3.69]	1.06	0.05	.07	[-1.93, 4.05]
Insurance [d]																				
No Insurance	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Parent's Policy	-4.77	0.10	-.38	[-18.92, 9.39]	-5.71	0.05	-.45	[-18.08, 6.66]	-2.31	0.04	-.18	[-13.31, 8.69]	-.94	0.03	-.07	[-11.40, 9.53]	-1.20	0.03	-.10	[-11.87, 9.47]
School Policy	-9.52	0.19	-.49	[-24.11, 5.09]	-9.48	0.10	-.49	[-22.24, 3.27]	-5.11	0.07	-.26	[-16.50, 6.29]	-2.69	0.06	-.14	[-13.61, 8.23]	-2.99	0.06	-.16	[-14.14, 8.17]
Individually Purchased Policy	-8.44	0.03	-.47	[-21.89, 5.01]	-7.55	0.01	-.42	[-19.30,	-4.25	0.01	-.24	[-14.71,	-2.27	0.01	-.13	[-12.26,	-2.50	0.01	-.14	[-12.69,

Predictor	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI
				4.21]				6.21]				7.73]				7.67]
Military Policy	-3.49	0.00	-.10	[-18.778, 11.79]	-6.01	0.00	-.18	[-19.39, 7.38]	-1.89	0.00	-.06	[-13.82, 10.04]	-.49	0.00	-.01	[-11.84, 10.86]	-.79	0.00	-.02	[-12.37, 10.80]
Government Policy	-8.34	0.00	-.32	[-23.38, 6.69]	-7.07	0.00	-.27	[-20.22, 6.07]	-3.43	0.00	-.13	[-15.12, 8.26]	-2.55	0.00	-.10	[-13.65, 8.54]	-2.89	0.00	-.11	[-14.27, 8.49]
Attitudes					.31	0.94	**.55**	[.18, .43]	.18	0.69	**.31**	[.05, .30]	.14	0.62	**.24**	[.02, .25]	.14	0.62	**.24**	[.02, .26]
Subjective Norms									.28	0.92	**.48**	[.16, .40]	.25	0.85	**.43**	[.14, .37]	.25	0.85	**.43**	[.14, .37]
PBC													.50	0.44	**.26**	[.18, .83]	.51	0.44	**.27**	[.18, .84]
Masculinity																	.03	0.03	.03	**[-.14, .20]**

Note. r_s^2 = structure coefficient. CI = 95% confidence interval. Statistically significant (p < 0.05) associations are bolded

[a] Race/Ethnicity was represented by one dummy variable with White serving as the reference group.

[b] Relationship status was represented by four dummy variables with Single, not in a monogamous relationship serving as the reference group.

[c] Religion was represented by ten dummy variables with Non-denominational Christian serving as the reference group.

[d] Insurance was represented by six dummy variables with no insurance serving as the reference group.

Table 4. *Behavioral Intention to use a Male Hormonal Birth Control Gel*

Predictor	Model 1 $R^2 = .10$ $F = .57$				Model 2 $R^2 = .45$ $F = 3.85$				Model 3 $R^2 = .60$ $F = 6.40$				Model 4 $R^2 = .64$ $F = 7.13$				Model 5 $R^2 = .64$ $F = 6.72$			
	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI
Age	0.03	0.08	0.04	[-0.25, 0.32]	-0.06	0.02	-0.09	[-0.29, 0.15]	0.03	0.01	0.04	[-0.16, 0.23]	0.01	0.01	0.02	[-0.17, 0.21]	0.01	0.01	0.01	[-0.18, 0.20]
Race/Ethnicity [a]																				
White	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Non-White	-0.22	0.00	-0.01	[-4.33, 3.89]	-0.36	0.00	-0.02	[-3.59, 2.87]	0.19	0.00	0.01	[-2.64, 3.00]	0.11	0.00	0.00	[-2.56, 2.78]	0.04	0.00	0.00	[-2.66, 2.74]
Relationship Status [b]																				
Single, not in a monogamous relationship	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Single, in a monogamous relationship	-0.16	0.00	-0.01	[-3.28, 2.96]	0.34	0.00	0.02	[-2.11, 2.80]	0.02	0.00	0.00	[-2.10, 2.15]	0.41	0.00	0.03	[-1.63, 2.46]	0.45	0.00	0.03	[-1.61, 2.51]
Married	-2.34	0.08	-0.14	[-8.92, 4.25]	-1.26	0.02	-0.07	[-6.45, 3.91]	-0.95	0.01	-0.06	[-5.44, 3.52]	-1.33	0.01	-0.08	[-5.62, 2.95]	-1.24	0.01	-0.07	[-5.56, 3.08]
Religion [c]																				
Non-denominational Christian	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Catholic	-2.57	0.14	-0.15	[-6.50, 1.36]	-2.61	0.03	**-0.15**	[-5.70, 0.47]	-1.21	0.02	-0.07	[-3.94, 1.50]	-1.41	0.02	-0.08	[-4.02, 1.18]	-1.42	0.02	-0.08	[-4.03, 1.19]

Variable	M1 B	M1 rs	M1 rs²	M1 CI	M2 B	M2 rs	M2 rs²	M2 CI	M3 B	M3 rs	M3 rs²	M3 CI	M4 B	M4 rs	M4 rs²	M4 CI	M5 B	M5 rs	M5 rs²	M5 CI
Protestant	-3.75	0.34	-0.18	[-8.35, 0.85]	-2.15	0.07	-0.10	[-5.80, 1.48]	-2.25	0.06	-0.11	[-5.40, 0.89]	-2.52	0.05	-0.12	[-5.53, 0.49]	-2.52	0.05	-0.12	[-5.54, 0.50]
Hindu	3.30	0.04	0.05	[-9.65, 16.25]	-1.30	0.01	-0.02	[-11.56, 8.95]	-0.15	0.01	-0.00	[-9.03, 8.72]	-0.46	0.01	-0.00	[-8.94, 8.00]	-0.25	0.01	-0.00	[-8.82, 8.30]
Buddhist	-3.13	0.05	-0.05	[-17.01, 10.74]	-1.72	0.01	-0.02	[-12.63, 9.19]	-4.72	0.01	-0.08	[-14.23, 4.77]	-2.71	0.01	-0.04	[-11.88, 6.44]	-2.53	0.01	-0.04	[-11.77, 6.71]
Islamic	-0.27	0.01	-0.00	[-9.18, 8.63]	3.29	0.00	0.09	[-3.77, 10.36]	0.20	0.00	0.00	[-6.02, 6.42]	1.55	0.00	0.04	[-4.45, 7.55]	1.61	0.00	0.04	[-4.43, 7.65]
Atheist	1.07	0.06	0.05	[-3.57, 5.72]	-1.63	0.01	-0.08	[-5.36, 2.09]	-0.68	0.01	-0.03	[-3.93, 2.55]	-1.20	0.01	-0.06	[-4.31, 1.91]	-1.00	0.01	-0.05	[-4.23, 2.22]
Agnostic	-0.21	0.06	-0.01	[-4.00, 3.58]	-2.18	0.01	-0.14	[-5.217, 0.84]	-1.44	0.01	-0.09	[-4.08, 1.18]	-1.55	0.01	-0.10	[-4.07, 0.95]	-1.30	0.01	-0.08	[-4.03, 1.41]
Insurance [d]																				
No Insurance	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Parent's Policy	-1.11	0.17	-0.08	[-10.71, 8.48]	0.52	0.04	0.04	[-7.03, 8.08]	0.26	0.03	0.02	[-6.26, 6.80]	-0.58	0.03	-0.04	[-6.84, 5.67]	-0.70	0.03	-0.05	[-7.01, 5.60]
School Policy	-3.65	0.18	-0.18	[-14.17, 6.87]	0.06	0.04	0.00	[-8.27, 8.39]	0.81	0.03	0.04	[-6.39, 8.02]	0.10	0.03	0.00	[-6.79, 6.99]	-0.07	0.03	-0.00	[-7.03, 6.89]
Individually Purchased Policy	-0.38	0.06	-0.02	[-10.77, 10.00]	2.33	0.01	0.12	[-5.86, 10.53]	1.16	0.01	0.06	[-5.94, 8.26]	1.08	0.01	0.06	[-5.69, 7.85]	0.97	0.01	0.05	[-5.85, 7.79]
Military Policy	3.34	0.07	0.09	[-8.54, 15.22]	3.53	0.01	0.10	[-5.80, 12.87]	4.11	0.01	0.12	[-3.96, 12.19]	3.00	0.01	0.08	[-4.73, 10.74]	2.84	0.01	0.08	[-4.96, 10.65]
Government Policy	-3.70	0.02	-0.15	[-14.60, 7.19]	1.34	0.00	0.05	[-7.32, 10.02]	1.94	0.00	0.07	[-5.56, 9.44]	-0.06	0.00	-0.00	[-7.35, 7.21]	-0.29	0.00	-0.01	[-7.67, 7.09]
Attitudes					0.35	0.92	**0.67**	[0.25, 0.45]	0.20	0.69	**0.38**	[0.09, 0.30]	0.15	0.66	**0.29**	[0.05, 0.26]	0.16	0.66	**0.3**	[0.05, 0.26]
Subjective Norms									0.29	0.85	**0.49**	[0.18, 0.41]	0.25	0.79	**0.41**	[0.14, 0.36]	0.25	0.79	**0.41**	[0.14, 0.36]
PBC													0.50	0.53	**0.25**	[0.16, 0.83]	0.51	0.53	**0.26**	[0.17, 0.85]
Masculinity																	0.03	0.04	0.04	**[-0.11, 0.19]**

Note. r_s^2 = structure coefficient. CI = 95% confidence interval. Statistically significant (p < 0.05) associations are bolded

[a] Race/Ethnicity was represented by one dummy variable with White serving as the reference group.

[b] Relationship status was represented by four dummy variables with Single, not in a monogamous relationship serving as the reference group.

[c] Religion was represented by ten dummy variables with Non-denominational Christian serving as the reference group.

[d] Insurance was represented by six dummy variables with no insurance serving as the reference group.

Table 5. *Behavioral Intention to use a Male Hormonal Birth Control Injection*

Predictor	Model 1 R²=.25 F=1.65 B	rs²	β	95% CI	Model 2 R²=.49 F=4.48 B	rs²	β	95% CI	Model 3 R²=.70 F=10.05 B	rs²	β	95% CI	Model 4 R²=.71 F=10.09 B	rs²	β	95% CI	Model 5 R²=.72 F=9.50 B	rs²	β	95% CI
Age	.28	0.06	.36	[-.00, .57]	.17	0.03	.21	[-.07, .41]	.21	0.02	**.28**	[.02, .40]	.18	0.02	.23	[-.00, .37]	.17	0.02	.22	[-.01, .36]
Race/Ethnicity [a]																				
White	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Non-White	-2.51	0.01	-.14	[-6.55, 1.52]	-2.02	0.00	-.11	[-5.36, 1.31]	-.11	0.00	-.00	[-2.74, 2.51]	-.19	0.00	-.01	[-2.77, 2.39]	-.25	0.00	-.01	[-2.87, 2.35]
Relationship Status [b]																				
Single, not in a monogamous relationship	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Single, in a monogamous relationship	.47	0.03	.03	[-2.62, 3.57]	-.95	0.01	-.06	[-3.56, 1.64]	-.43	0.01	-.02	[-2.44, 1.58]	-.33	0.01	-.02	[-2.32, 1.64]	-.30	0.01	-.02	[-2.30, 1.69]
Married	.11	0.02	.00	[-7.29, 7.51]	-2.20	0.01	-.12	[-8.36, 3.95]	-1.04	0.01	-.06	[-5.81, 3.72]	-.82	0.01	-.04	[-5.51, 3.86]	-.71	0.01	-.04	[-5.44, 4.01]
Religion [c]																				
Non-denominational Christian	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Catholic	-5.60	0.14	**-.32**	[-9.42, -1.77]	-3.72	0.07	**-.21**	[-6.94, -.51]	-2.11	0.05	-.12	[-4.63, .41]	-2.24	0.05	-.13	[-4.72, .23]	-2.22	0.05	-.13	[-4.71, .27]
Protestant	-3.31	0.07	-.15	[-7.86, 1.24]	-1.35	0.04	-.06	[-5.17, 2.45]	-2.52	0.03	-.11	[-5.48, .44]	-2.61	0.03	-.12	[-5.52, .30]	-2.62	0.03	-.12	[-5.55, .30]
Hindu	-5.39	0.04	-.08	[-18.15, 7.35]	-6.33	0.02	-.10	[-16.87, 4.20]	-6.74	0.01	-.10	[-14.89, 1.39]	-6.52	0.01	-.10	[-14.52, 1.46]	-6.29	0.01	-.10	[-14.38, 1.79]
Buddhist	9.66	0.00	.15	[-3.99, 23.33]	7.84	0.00	.12	[-3.45, 19.14]	.80	0.00	.01	[-8.13, 9.74]	.68	0.00	.01	[-8.09, 9.45]	.78	0.00	.01	[-8.04, 9.62]
Islamic	-1.46	0.00	-.04	[-10.33, 7.41]	2.52	0.00	.06	[-4.91, 9.97]	-.99	0.00	-.02	[-6.81, 4.83]	-.49	0.00	-.01	[-6.23, 5.25]	-.47	0.00	-.01	[-6.24, 5.30]
Atheist	-1.55	0.00	-.07	[-6.14, 3.03]	-2.90	0.00	-.14	[-6.72, .91]	-.60	0.00	-.02	[-3.61, 2.41]	-.85	0.00	-.04	[-3.82, 2.11]	-.65	0.00	-.03	[-3.74, 2.44]
Agnostic	.96	0.10	.06	[-2.85, 4.79]	-1.75	0.05	-.10	[-5.04, 1.52]	-1.56	0.04	-.09	[-4.09, .97]	-1.52	0.04	-.09	[-4.01, .96]	-1.30	0.04	-.08	[-3.96, 1.36]
Insurance [d]																				
No Insurance	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Parent's Policy	-7.35	0.00	-.54	[-16.94, 2.23]	-7.12	0.00	**-.53**	[-15.06, .79]	-5.24	0.00	-.39	[-11.38, .89]	-5.15	0.00	-.38	[-11.18, .87]	-5.23	0.00	-.39	[-11.30, .83]
School Policy	-13.13	0.06	**-.63**	[-23.61, -2.66]	-9.90	0.03	**-.47**	[-18.61, -1.18]	-6.30	0.02	-.30	[-13.11, .49]	-5.95	0.02	-.28	[-12.64, .72]	-6.09	0.02	-.29	[-12.83, .65]

Predictor	Model 1				Model 2				Model 3				Model 4				Model 5			
	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI
Individually Purchased Policy	-12.13	0.00	**-.63**	[-22.35, -1.92]	-9.04	0.00	**-.47**	[-17.54, -.54]	-7.87	0.00	**-.41**	[-14.44, -1.30]	-7.34	0.00	**-.38**	[-13.81, -.86]	-7.44	0.00	**-.38**	[-13.96, -.92]
Military Policy	-5.57	0.00	-.15	[-17.27, 6.13]	-6.65	0.00	-.18	[-16.32, 3.02]	-4.47	0.00	-.12	[-11.97, 3.01]	-4.27	0.00	-.11	[-11.63, 3.08]	-4.41	0.00	-.12	[-11.82, 3.00]
Government Policy	-7.72	0.02	-.29	[-18.53, 3.09]	-5.49	0.01	-.20	[-14.45, 3.46]	-4.19	0.01	-.16	[-11.12, 2.73]	-4.48	0.01	-.17	[-11.29, 2.32]	-4.67	0.01	-.17	[-11.56, 2.21]
Attitudes					.31	0.62	**.59**	[.21, .42]	.16	0.44	**.30**	[.07, .25]	.13	0.42	**.24**	[.03, .22]	.13	0.42	**.24**	[.03, .22]
Subjective Norms									.35	0.72	**.57**	[.25, .44]	.30	0.71	**.49**	[.20, .41]	.30	0.71	**.50**	[.20, .41]
PBC													.35	0.49	.16	[-.00, .70]	.35	0.49	**.17**	[.00, .71]
Masculinity																	.03	0.02	**.03**	[-.11, .18]

Note. r_s^2 = structure coefficient. CI = 95% confidence interval. Statistically significant (p < 0.05) associations are bolded
[a] Race/Ethnicity was represented by one dummy variable with White serving as the reference group.
[b] Relationship status was represented by four dummy variables with Single, not in a monogamous relationship serving as the reference group.
[c] Religion was represented by ten dummy variables with Non-denominational Christian serving as the reference group.
[d] Insurance was represented by six dummy variables with no insurance serving as the reference group.

Table 6. *Behavioral Intention to use an Implant*

Predictor	Model 1 $R^2 = .21$ $F = 1.31$				Model 2 $R^2 = .54$ $F = 5.45$				Model 3 $R^2 = .63$ $F = 7.41$				Model 4 $R^2 = .65$ $F = 7.42$				Model 5 $R^2 = .66$ $F = 7.20$			
	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI	B	r_s^2	β	95% CI
Age	.21	0.00	.29	[-.05, .48]	.10	0.00	.14	[-.10, .31]	.16	0.00	.22	[-.02, .35]	.14	0.00	.19	[-.05, .33]	.12	0.00	.16	[-.07, .31]
Race/Ethnicity [a]																				
White	--		--	--	--		--	--	--		--	--	--		--	--	--		--	--
Non-White	-4.52	0.05	-.27	[-8.48, -.56]	-2.75	0.02	-.17	[-5.81, .31]	-1.95	0.02	-.12	[-4.73, .83]	-1.98	0.02	-.12	[-4.72, .75]	-2.16	0.02	-.13	[-4.90, .57]
Relationship Status [b]																				
Single, not in a monogamous relationship	--		--	--	--		--	--	--		--	--	--		--	--	--		--	--
Single, in a monogamous relationship	.94	0.07	.06	[-2.11, 3.99]	.05	0.03	.00	[-2.28, 2.39]	-.02	0.02	-.00	[-2.14, 2.08]	-1.98	0.02	-.00	[-4.72, .75]	.01	0.02	.00	[-2.05, 2.08]
Married	-3.37	0.01	-.20	[-9.69, 2.93]	-3.45	0.00	-.21	[-8.27, 1.37]	-3.32	0.00	-.20	[-7.67, 1.01]	-1.98	0.00	-.18	[-4.72, .75]	-2.77	0.00	-.17	[-7.06, 1.51]
Religion [c]																				
Non-denominational Christian	--		--	--	--		--	--	--		--	--	--		--	--	--		--	--

	B	p	r_s^2	CI	B	p	r_s^2	CI	B	p	r_s^2	CI	B	p	r_s^2	CI	B	p	r_s^2	CI
Catholic	-3.54	0.08	-.21	[-7.33, .24]	-2.70	0.03	-.16	[-5.60, .19]	-2.09	0.03	-.12	[-4.72, .53]	-1.98	0.03	-.14	[-4.72, .75]	-2.27	0.03	-.13	[-4.86, .31]
Protestant	.90	0.00	.04	[-3.52, 5.32]	-.36	0.00	-.01	[-3.76, 3.03]	-.66	0.00	-.03	[-3.72, 2.40]	-1.98	0.00	-.03	[-4.72, .75]	-.73	0.00	-.03	[-3.74, 2.26]
Hindu	6.42	0.01	.10	[-6.00, 18.85]	-.05	0.00	-.00	[-9.70, 9.59]	-.45	0.00	-.00	[-9.14, 8.23]	-1.98	0.00	-.01	[-4.72, .75]	-.04	0.00	-.00	[-8.61, 8.51]
Buddhist	5.94	0.02	.10	[-7.36, 19.25]	3.52	0.01	.05	[-6.66, 13.70]	2.67	0.01	.04	[-6.50, 11.86]	-1.98	0.01	.01	[-4.72, .75]	1.19	0.01	.02	[-8.01, 10.40]
Islamic	5.36	0.00	.15	[-3.20, 13.93]	6.30	0.00	.18	[-.24, 12.85]	3.93	0.00	.11	[-2.06, 9.93]	-1.98	0.00	.11	[-4.72, .75]	4.09	0.00	.11	[-1.78, 9.97]
Atheist	-.41	0.01	-.02	[-4.87, 4.05]	-3.09	0.00	-.15	[-6.58, .38]	-1.26	0.00	-.06	[-4.50, 1.98]	-1.98	0.00	-.07	[-4.72, .75]	-.94	0.00	-.04	[-4.24, 2.36]
Agnostic	-.08	0.01	-.00	[-3.73, 3.57]	-2.25	0.00	-.14	[-5.10, .59]	-2.22	0.00	-.14	[-4.79, .34]	-1.98	0.00	-.12	[-4.72, .75]	-1.22	0.00	-.08	[-3.97, 1.51]
Insurance [d]																				
No Insurance	--		--	--	--		--	--	--		--	--	--		--	--	--		--	--
Parent's Policy	-9.77	0.03	**-.76**	[-18.98, -.55]	-7.02	0.01	-.54	[-14.09, .05]	-5.39	0.01	-.42	[-11.80, 1.02]	-1.98	0.01	-.42	[-4.72, .75]	-5.67	0.01	-.44	[-11.97, .62]
School Policy	-16.07	0.14	-.81	[-26.16, -5.98]	-10.02	0.05	**-.50**	[-17.89, -2.15]	-7.89	0.04	**-.40**	[-15.04, -.73]	-1.98	0.04	**-.37**	[-4.72, .75]	-7.74	0.04	**-.39**	[-14.80, -.68]
Individually Purchased Policy	-12.28	0.02	**-.67**	[-22.24, -2.31]	-7.64	0.01	-.41	[-15.34, .06]	-6.77	0.01	-.37	[-13.72, .18]	-1.98	0.01	-.36	[-4.72, .75]	-7.00	0.01	**-.38**	[-13.83, -.17]
Military Policy	-7.49	0.00	-.21	[-18.89, 3.90]	-6.20	0.00	-.17	[-14.91, 2.51]	-4.23	0.00	-.12	[-12.13, 3.66]	-1.98	0.00	-.14	[-4.72, .75]	-5.26	0.00	-.15	[-13.05, 2.53]
Government Policy	-12.35	0.01	**-.45**	[-23.00, -1.71]	-8.23	0.00	**-.30**	[-16.43, -.03]	-6.38	0.00	-.23	[-13.82, 1.05]	-1.98	0.00	-.25	[-4.72, .75]	-7.54	0.00	-.27	[-14.91, -.17]
Attitudes					.32	0.69	**.65**	[.23, .41]	.20	0.59	**.41**	[.11, .29]	-1.98	0.59	**.34**	[-4.72, .75]	.16	0.56	**.34**	[.06, .26]
Subjective Norms									.23	0.76	**.40**	[.12, .33]	-1.98	0.76	**.31**	[-4.72, .75]	.18	0.72	**.31**	[.06, .29]
PBC													-1.98	0.53	.19	[-4.72, .75]	.39	0.52	.20	[-.00, .78]
Masculinity																	.09	0.01	.10	[-.05, .25]

Note. r_s^2 = structure coefficient. CI = 95% confidence interval. Statistically significant (p < 0.05) associations are bolded

[a] Race/Ethnicity was represented by one dummy variable with White serving as the reference group.

[b] Relationship status was represented by four dummy variables with Single, not in a monogamous relationship serving as the reference group.

[c] Religion was represented by ten dummy variables with Non-denominational Christian serving as the reference group.

[d] Insurance was represented by six dummy variables with no insurance serving as the reference group.

college students' having an individually purchased healthcare policy (β = -.38, p = 0.026). In assessing the squared structure coefficients, attitudes, subjective norms, and perceived behavioral control positively accounted for 42 percent, 71 percent, and 49 percent, respectively, of the effect in the final model. Regression weights, structure coefficients, and confidence intervals are shown in Table 5.

Behavioral Intention to use a Male Contraceptive Implant

Multiple linear regression was used to run five models for predicting male college students' intention to use an implant. For the first model, only demographic variables were entered. The first model was not statistically significant. The second model included all demographic variables and the TPB construct attitude towards an implant. The second model was statistically significant and accounted for 54 percent of the variance (F [17, 77] = 5.45, p = 0.001, R2 = 0.54). The third model included all demographic variables and the TPB constructs attitude towards an implant injection and subjective norms. The third model was statistically significant and accounted for 63 percent of the variance (F [18, 76] 7.41, p = 0.001, R2 = 0.63). The fourth model included all demographic variables and the TPB constructs attitude towards an implant, subjective norms, and perceived behavioral control. The fourth model was statistically significant and accounted for 65 percent of the variance (F [19, 75] = 7.42, p = 0.001, R2 = 0.65). The final model included all demographic variables, all TPB constructs, and an added masculinity variable. The final model was statistically significant and accounted for 66 percent of the variance (F [20, 74] 7.20, p = 0.001, R2 = 0.66). In the final model, intention to use an implant was positively predicted by male college students': attitudes (β = .34, p = 0.001) and subjective norms (β = .31, p = 0.003). Intention to use an implant was negatively predicted by male college students': having a school purchased healthcare policy (β = -.39, p = 0.032) and having an individually purchased healthcare policy (β = -.38, p = 0.045). In assessing the squared structure coefficients, attitudes and subjective norms positively

accounted for 56 percent and 72 percent, respectively, of the effect in the final model. Regression weights, structure coefficients, and confidence intervals are shown in Table 6.

Discussion

In this study, we used the TPB constructs to assess college men's intention to use innovative methods of MDC. Behavioral intention to use each method of MDC was low, with the male contraceptive pill and transdermal gel having the highest mean intention scores. Although behavioral intention was low for each method, the regression models were statistically significant for each contraceptive method and demonstrated TPB constructs association with intended use for each method. Attitudes, subjective norms, and PBC were all found to be associated with intention to use a male hormonal pill, transdermal gel, and injection. Attitudes and subjective norms were also found to be associated with intention to use a male birth control implant. These results suggest the TPB may be a suitable theory for further investigation into the intended use of MDC. Masculinity was not found to be associated with intended MDC use.

Overall intention to use each method of MDC was low. While dominate gender norms surrounding reproductive responsibility lead many to conclude no market exists for male contraceptives, this is inconsistent with prior research. Not only do men believe they should take more responsibility for family planning (Glasier et al., 2010) but evidence suggests men are willing to use such methods. Multiple studies have found acceptability of MDC or willingness to use MDC to be high (Heinemann, Saad, Wiesemes, White, & Heinemann, 2005; Marcell, Plowden, & Bowman, 2005; Martin et al., 2000; Weston, Schlipalius, & Vollenhoven, 2002; Weston, Schlipalius, Bhuinneain, & Vollenhoven, 2002). In studying specific MDC methods, studies have found high acceptability of a male contraceptive pill (Dismore, Van Wersch, & Swainston, 2016; Walker, 2011), transdermal gel (Amory, Page, Anawalt, Matsumoto, & Bremner, 2007; Roth et al., 2014), and injectable contraceptives (Meriggiola et al., 2006) to be high. The low intention scores in the current study, however, do not wholly reflect the level of

attitudes, subjective norms, and PBC which were moderate to high for each method in every model. The low intention scores, but high levels of attitudes, subjective norms, and PBC may be indicative of other factors not captured by the TPB. For example, some men have expressed their willingness to use a contraceptive method is dependent upon cost and potential side effects (Vera Cruz, Humeau, Moore, & Mullet, 2019). Impending research should continue using theory-based approaches to investigate factors associated with potential use of MDC. The Health Belief Model (HBM) for example may provide a good theoretical understanding to factors associated with intention or potential use of MDC. The HBM would allow researchers to investigate men's perceived susceptibly and severity of unintended pregnancies while also investigating their perceived benefits and potential barriers to MDC use.

In the current study, college men had the greatest intention to use a male contraceptive pill or a transdermal gel. This is consistent with prior research identifying an oral pill as the preferred method of contraception (Dismore et al., 2016, Heinemann et al., 2005; Westen et al., 2002; Western et al., 2002); however, whether an oral pill is the first or second choice of contraception is still up for debate. Method preference is a practical concern because the most successful male hormonal methods trailed to date have used injectable hormones as opposed to an oral pill. While an injectable contraceptive is routinely found to be one of the most preferred methods of MDC (Dismore et al., 2016, Heinemann et al., 2005; Westen et al., 2002; Western et al., 2002), future research should continue to investigate method preference. Moreover, research is needed on the exact administrative method of MDC methods. Compared to gynecology, the field of andrology remains small. The field of andrology is also fragmented with practitioners with specific knowledge of the male reproductive system being distributed over several medical specialties as opposed to being concentrated in one specialty as is the case for the female reproductive system (Oudshoorn, 2003, p. 26). The field of andrology's small size and fragmentation will pose logistical challenges in the uptake of MDC if and when it becomes commercially available. Research is needed to mitigate these challenges.

Attitudes towards each contraceptive method were associated with behavioral intention in each of the four models and accounted for a significant portion of the variance. Attitudes are strongly associated with acceptability, which is an indirect measure of intended use (Glasier, 2010). In other contraceptive research, attitudes are one of the most important factors associated with behavior when background characteristics and contraceptive knowledge are controlled (Frost, Lindberg, & Finer, 2012). Additionally, a study of five health behavior models found attitudes to have the strongest correlation with behavior and was a direct predictor of contraceptive use (Reid & Aiken, 2011). Thus, understanding male attitudes towards MDC maybe the most significant factor associated with understanding future use. Given the high portion of variance explained by attitudes in the current study, future research should investigate the specific attitudes that contribute the most to intended use of MDC. Attitudes for consideration include: side effects, responsibility, advantages and disadvantages of each method. Similar to attitudes, the construct subjective norms were associated with intention to use all four methods of MDC. Additionally, subjective norms accounted for the most variance in the final model for each method of MDC. This is consistent with prior contraceptive research identifying the association between subjective norms and behavioral intention (Asare, 2015; Rich et al., 2014). Given subjective norms accounted for the most variance for all methods of MDC, future research should investigate the specific normative beliefs contributing to intended MDC use.

Perceived behavioral control (PBC) or the extent to which people believe they are in control of using the MDC method was only associated with intention to use a male contraceptive pill, transdermal gel, and contraceptive injection. MDC use is still a hypothetical behavior, making the investigation of PBC difficult. For example, the exact delivery system and dosage of each MDC method remains unknown, making our understanding of PBC tentative at best. Despite these challenges, research should continue to investigate men's perceived control over using such methods. Control and potential use of different methods, delivery systems, and dosages should continue to be investigated. Currently,

investment in MDC is low because pharmaceutical companies do not believe MDC to be a lucrative investment (Oudshoorn, 2003). If social science researchers can show men are willing to use different methods of MDC, and identify the methods and dosages preferred, then pharmaceutical companies maybe more inclined to invest in the development of MDC methods.

Despite the literature suggesting gender norms, specifically masculinity, being a modifying factor of attitudes towards MDC (Dismore et al., 2016; Peterson et al., 2019; Walker, 2011; Zhang et al., 2006), the current study found no association between masculinity and intention to use any of the four methods of MDC. This suggests any impact of masculinity on intended use of MDC methods is likely to be indirect. Masculinity is a result of socially identifiable behaviors, beliefs, feelings, values, and cognitions of male identity (Knight et al., 2012; Rothgerber, 2013; Wester & Vogel, 2012) making it possible enactments of specific gender norms were better measured by TPB constructs. Evidence also suggest gender norms surrounding contraceptive responsibility are changing (Darroch, 2008). Therefore, the idea of masculinity as a modifying factor of intention to use MDC may not be best measured in a younger population. Regardless, gender norms and contraceptive responsibly are a persistent theme in contraceptive research and should be continuously investigated.

Limitations

There are several limitations which should be noted. Frist, all data were self-reported and may not accurately reflect participants true attitudes towards MDC. Additionally, this was a cross sectional study with a sample collected from one Midwestern University. The majority of participants identified as white and between the ages of 18-24 making generalizability to the larger population limited. The current study also examined a hypothetical behavior, thereby allowing only for a tentative understanding of theory constructs. Additionally, the TPB accounts for primarily individual level influences on behavior and does not account for structural or community-level factors which may also influence men's intention to use MDC. Lastly, the Cronbach alpha for the perceived behavioral control construct was low, limiting the predictive validity of the construct.

Conclusion

This research demonstrates the usefulness of applying the TPB in continued efforts to understand the intended use of MDC among college men. Despite the findings of this study, the development and availability of MDC however will not be enough to change the current contraceptive arrangement between men and women. It is thus important for health care professionals to involve men more fully in reproductive health care, specifically contraception, in order for the adoption of MDC to be successful. Subjective norms and attitudes towards MDC accounted for the most variability in behavioral intention. Therefore, future research should investigate specific attitudes and normative beliefs among men that influence their intention to use developmental methods of MDC.

Conflict of interest

The authors have no conflicts of interests to disclose.

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