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Conformity to Masculine Norms Predicts U.S. Men's Decision-Making Regarding a New Male  
Contraceptive

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## Abstract

Health decision-making is often explained by affective and cognitive processes, but this processing is rarely explored in relation to gender norms. We investigated how conformity to specific masculine norms are linked to the affective and cognitive processes that lead to U.S. men's decisions regarding a new male contraceptive. U.S. male college students ( $N = 151$ ) completed an online survey. They read a description of a long-acting reversible contraceptive, then completed questionnaires measuring their affective and cognitive responses, their information-seeking and willingness-to-try the contraceptive, and their conformity to masculine norms. Participants reported less willingness-to-try the contraceptive when they endorsed masculine norms regarding men's Power Over Women and concern with Heterosexual Self-Presentation, and these effects were consistently mediated by beliefs about its negative impact on sex. Positive emotions predicted willingness-to-try and information-seeking but were unrelated to masculine norms. This broadens our understanding of how conformity to specific gender norms impacts health decision-making processes.

Keywords: masculinity, health decision-making, contraceptives, gender norms, affect

## **Introduction**

We all make important health decisions in a world steeped with gender norms. As new medical advances emerge, social factors such as conformity to masculine and feminine norms will likely impact how people choose to utilise them. A particularly noteworthy innovation is the development of new male contraceptive products, which may soon be available in countries such as the U.S. (Sifferlin 2018). Since contraceptives are directly tied to gender relations in ways that many other health decisions are not, this is an interesting area to investigate the role of masculine norms and health decision-making.

### ***Masculinity and health decision-making***

Research has consistently found that men are less likely than women to seek help for physical and mental ailments or engage in health promoting behaviours and that men are more likely to engage in health-risk behaviours (for reviews see Addis and Mahalik 2003; Galdas, Cheater, and Marshall 2005; Garfield, Isacco, and Rogers 2008). These findings tend to remain consistent across men of different nationalities, ages, and ethnicities (Addis and Mahalik 2003), although much existing research has been focused on cisgender, heterosexual men.

Masculinity refers to ideologies and belief systems that develop about what it means to be a man within a particular culture. Masculinity is a multifaceted concept that varies across time, situations, and with respect to other social identities such as age, race, class, and sexual orientation (Addis and Mahalik 2003; Courtenay 2000). However, within particular social spheres, gendered norms for behaviour, and masculinities in particular, work to dictate prescriptions for how men should act in various contexts (Prentice and Carranza 2002). From a relational perspective, women have generally been positioned as the gatekeepers or guardians of reproductive and sexual health with men referred to as ‘forgotten clients’ (Fennell 2011; Solomon, Yount, and Mbizvo 2007).

Men are sometimes partners in the decision-making process of family planning or condom negotiation; however, gender norms often discourage men's full involvement even when men themselves feel that sexual health decision-making should be equal (James-Hawkins, Dalessandro, and Sennott 2019). Additionally, from a social justice perspective, not all men and women have equal access to choices regarding their reproductive health given that interlocking systems of oppression including race and social class can limit access to resources, education, and health care (Anderson et al. 2009).

In the current U.S. context, masculinity has been defined by particularly salient and distinct masculine norms for behaviour (Mahalik et al. 2003; Parent and Moradi 2009). Thus, from a psychological perspective and for the purposes of this study, we are investigating how each individual man engages with these masculine norms in order to inform his contraceptive decision-making. Specifically, we utilise the nine norms detailed in Parent and Moradi's (2009) Conformity to Masculine Norms Inventory 46 (CMNI-46): (1) Playboy: desire for multiple sexual partners rather than one committed relationship; (2) Heterosexual Self-Presentation: concern that others perceive him as heterosexual; (3) Power over Women: preference to have control over women personally and for men to have control societally; (4) Self-Reliance: handling things on his own without asking for help; (5) Emotional Control: preference for withholding rather than sharing his feelings; (6) Winning: concern with succeeding in competitions and other areas; (7) Risk-Taking: enjoyment of taking risks; (8) Violence: belief that violence is sometimes justifiable and willingness to take violent action if needed; (9) Primacy of Work: making work a large priority in life.

Given the multifaceted nature of masculinity, it is important to consider how endorsement of specific norms predicts differences in health decision-making. Indeed, certain masculine norms

are more relevant to particular outcomes and can indicate the motivations and/or barriers for the behaviour. For example, Primacy of Work and Winning are predictive of men's lack of exercise (Garfield, Isacco, and Rogers 2008) indicating that the barrier may be lack of time rather than disinterest, whereas Self-Reliance and Emotional Control are predictive of men's delays in medical and psychological help-seeking (Yousaf, Grunfeld, and Hunter 2015) indicating instead a desire to handle issues on their own. Masculine norms do not uniformly predict unhealthy decision-making. For example, although conformity to certain masculine norms (e.g., Risk-Taking) predicts alcohol problems, endorsement of other masculine norms (e.g., Primacy of Work) serve as protective factors against alcohol abuse (Iwamoto et al. 2011). This specific knowledge can promote prevention or intervention efforts to overcome barriers, design programmes that match motivations, and use messaging that highlights health behaviours in terms of the protective masculine norms.

In terms of contraceptive decision-making in heterosexual relationships, specific masculine norms also lead to unique outcomes. Once boys reach adolescence, pressure to engage in heterosexual interactions becomes a salient component of normative masculine behaviour (Reigeluth and Addis 2016). Norms dictate that men maintain a heterosexual self-presentation, engage with multiple romantic partners, and assert their right to have power over women to be traditionally masculine, and failing to meet standards can undermine their sense of masculinity (Closson et al. 2019; Limmer 2016). Concern with displaying sexual voracity and skill (related to Heterosexual Self-Presentation norms) can lead to avoidance of contraceptives such as condoms (Limmer 2016), and endorsement of Power Over Women in marriage specifically predicted men's rejection of vasectomies (Hernández-Aguilera and Marván 2016). Other masculine norms such as Self-Reliance and Emotional Control likely block men from seeking medical assistance in relation

to their reproductive health (Yousaf, Grunfeld, and Hunter 2015). However, men focused on obtaining more frequent and spontaneous sexual activity and gaining control of paternity (related to Playboy norms) tend to hold positive attitudes toward male hormonal contraceptive methods (Solomon, Yount, and Mbizvo 2007; Walker 2011). Therefore, contraception is a fruitful area in which to more purposefully examine how distinct masculine norms differentially relate to men's health decision-making.

In this study, we examine U.S. men's decision-making surrounding a relatively new long-acting reversible contraceptive called RISUG (Reversible Inhibition of Sperm Under Guidance). The use of RISUG involves a minor procedure in which a doctor injects a polymer gel to prevent sperm from being released during ejaculation (Sifferlin 2018). Clinical trials in India demonstrate it is highly effective at preventing pregnancy for up to 10 years (Lohiya et al. 2014). Importantly, it is reversible, and the gel can be flushed out to resume the flow of sperm by receiving another minor procedure. RISUG is currently going through trials in the U.S. under the name Vasalgel and will likely be available in the relatively near future (Sifferlin 2018).

### ***Affective and cognitive processes in health decision-making***

To further understand the influence of masculine norms, it is necessary to investigate the psychological processes by which conformity to masculine norms impacts men's decision-making (Addis and Mahalik 2003; Galdas, Cheater, and Marshall 2005). Several models are widely used to predict health decision-making and behaviours, such as the health belief model (Rosenstock 1974) and the theory of planned behaviour (Ajzen 1991). One weakness of these models is that they tend to assume people's use of more deliberate, cognitive processing of information with less consideration of automatic, affective processes (McEachan et al. 2011). Evidence suggests that affective processes are often stronger or more proximal predictors of many health decisions (Keer,

van den Putte, and Neijens 2010), including the use of condoms and long-acting reversible contraceptives (Ellis, Rajagopal, and Kiviniemi 2018; Glasier, Scorer, and Bigrigg 2008; Norton et al. 2005).

Dual-process models of thinking and decision-making (e.g., Kahneman 2011) distinguish the affective route (including the automatic associations people make and the emotions they feel when presented with a concept, more emotional processing) from cognitive route (including the knowledge and beliefs people have about a concept, more analytical processing). The two routes commonly work together, although the affective route is often more quickly initiated and often drives later processing (Kahneman 2011). These dual processes are particularly important to understanding sexual behaviours and contraceptive use in particular (Ellis, Rajagopal, and Kiviniemi 2018; Gutnik et al. 2006).

Less research examines the psychological processes by which conformity to masculine norms impacts decision-making. Research focused on masculinity as a singular construct finds that endorsement of traditional masculinity reduces men's likelihood of medical or psychological help-seeking by influencing their attitudes about help-seeking (Smith, Tran, and Thompson 2008) or increasing the self-stigmatising of help-seeking behaviour (Vogel et al. 2011; Wasylkiw and Clairo 2018). Endorsement of traditional masculinity also reduced condom use by increasing men's negative attitudes about condoms (Noar and Morokoff 2002). However, attitudes and self-stigmatising involve both affective and cognitive components. Therefore, this research does not purposefully examine the differential roles of affective or cognitive processes.

### ***Current study***

The current study utilises a survey methodology to measure the relative importance of masculine norms, affective processes, and cognitive processes in decision-making regarding a new

male contraceptive. Our methodological approach is similar to that of dual-process researchers who investigate health and technology acceptance decision-making (e.g., Truelove 2012). This study is novel in its investigation of how conformity to specific masculine norms links to the affective and cognitive processes that lead to men's health decision-making, in this case regarding information-seeking or willingness-to-try a new male contraceptive.

Owing to past work on masculine norms and contraceptive use, we hypothesise that (1) Playboy will be a positive predictor of information-seeking and willingness-to-try the male contraceptive (Solomon, Yount, and Mbizvo 2007; Walker 2011) whereas (2) Heterosexual Self-Presentation and Power Over Women will be negative predictors of information-seeking and willingness-to-try (Hernández-Aguilera and Marván 2016; Limmer 2016). Since the use of RISUG requires the help-seeking behaviour of scheduling the procedure with a doctor, we hypothesise that (3) Self-Reliance and Emotional Control will be negative predictors of information-seeking and willingness-to-try (Yousaf, Grunfeld, and Hunter 2015). We further hypothesise that (4) conformity to other masculine norms (Winning, Risk-Taking, Violence, and Primacy of Work) will be unrelated to information-seeking and willingness-to-try.

Since dual-process models have successfully predicted a variety of contraceptive behaviours (Ellis, Rajagopal, and Kiviniemi 2018; Gutnik et al. 2006) we hypothesise that (5) both affective processes (including affective valence of the automatic associations people make and specific emotions they feel in response to the contraceptive) and cognitive processes (including specific beliefs about the contraceptive) will predict information-seeking and willingness-to-try. We will also more directly explore the different types of automatic word associations these men report after reading about the contraceptive. Finally, since past research indicates that the link between masculinity and health behaviours is mediated by factors such as attitudes and self-

stigmatising that have both affective and cognitive elements (Noar and Morokoff 2002; Vogel et al. 2011), we hypothesise that (6) both affective and cognitive processes will mediate the relationship between the conformity to each of the five masculine norms (e.g., Playboy, Heterosexual Self-Presentation, Power Over Women, Self-Reliance, and Emotion Control) and information-seeking and willingness-to-try the male contraceptive.

## **Method**

### ***Sampling and participants***

Male college students ( $N = 161$ ) were recruited from psychology department participant pools at two U.S. colleges in New England over the course of three semesters from 2017-2018. Participants who did not give consent ( $N = 3$ ) or were female ( $N = 3$ ) were removed from further analyses. Males who indicated 'gay' as their sexual orientation ( $N = 4$ ) were also removed since a contraceptive designed solely to prevent pregnancy is perhaps irrelevant to their sexual health concerns, but those indicating other sexual orientations were retained. The final dataset included 151 male participants ranging in age from 18 to 45 ( $M = 20.49$ ,  $SD = 4.08$ ). They were 56% White, 12% Latino, 11% Asian, 5% Black, and 5% reported a multi-ethnic background. Eighty-two percent were heterosexual, 5% were bisexual, and 13% did not indicate their sexual orientation. The majority were sexually active (74%), currently single (59%), and did not have children (92%).

### ***Design and measures***

Participants completed the online survey via Qualtrics. They first read a summary about the long-acting reversible male contraceptive RISUG (adapted from Vasalgel 2018; see Appendix for summary). Participants then completed a series of questionnaires. The study was approved following an ethics review by the first author's college Institutional Review Board. Table 1 contains means, standard deviations, and Cronbach's alphas for each scale.

[Table 1 Here]

### *Automatic associations*

Participants were asked to report the first five words that came to mind after reading the summary so as to capture the automatic word associations they made in response to the new male contraceptive (adapted from Truelove 2012). The responses included a wide range of words (e.g., objects, adjectives, exclamations), which we organised into categories to describe the content of the automatic associations linked to the contraceptive. Participants also rated the affective valence of each word they listed on a scale from 1 (Very negative) to 5 (Very positive). These valences were averaged to obtain a total score of the affective valence of their automatic associations, which measured whether their automatic associations were generally more negative or positive.

### *Emotions*

Participants indicated how much they felt eight different emotions when thinking about the male birth control RISUG, rating each emotion on a scale from 1 (Does not describe my feelings) to 4 (Completely) (adapted from Truelove 2012). A principal-axis factor analysis was conducted with promax rotation and Kaiser normalisation on all eight items. When using the criterion of eigenvalues greater than 1, two factors accounted for 56.54% of the total variance. The items loaded on to two main scales: Negative emotions (dread, disgust, fearful, embarrassed, and angry; from .82 to .51) and positive emotions (happy, optimistic, and secure; from .84 to .59). The items within each scale were averaged to calculate a total score.

### *Cognitions*

Ten statements assessed beliefs about the contraceptive (adapted from Martin et al. 2000), and participants indicated how much they agreed with each on a scale from 1 (Strongly disagree) to 5 (Strongly agree). Again, a principal-axis factor analysis was conducted with promax rotation

and Kaiser normalisation including all 10 items. When using the criterion of eigenvalues greater than 1, three factors accounted for 63.73% of the total variance. Items loaded on to three main scales: efficacy beliefs (safe for health, allows for spontaneous sex, easily reversible, effective at preventing pregnancy, and feel control over preventing pregnancy; from .87 to .51), negative sex beliefs (lower sexual satisfaction, lower sexual desire, and feel less masculine; from .80 to .66), and beliefs about the inconvenience and expense of obtaining the contraceptive (two items, from .78 to .59). Efficacy beliefs items and negative sex beliefs items were each averaged to make scales. Inconvenience belief and expensive belief only correlated  $r = .51$  and therefore were treated as individual variables.

#### *Willingness-to-try and information-seeking*

Participants indicated their willingness-to-try and interest in seeking more information about the male contraceptive by responding to ‘Would you try the male birth control, RISUG?’ and ‘Would you be interested in learning more about the male birth control, RISUG?’, respectively. Participants responded from 1 (Definitely not) to 4 (Definitely yes), and each was investigated as an individual outcome measure.

#### *Conformity to masculine norms*

Participants completed the CMNI-46 (Parent and Moradi 2009), indicating how much they agreed with each statement from 1(Strongly disagree) to 5(Strongly agree). It assessed conformity to the nine distinct masculine norms previously described, and items within each scale were averaged to create nine total scores.

## **Results**

First, to investigate the content of automatic word association responses ( $N = 774$ ), an inductive content analysis approach was utilised. Responses were categorised by their similar

meaning or valence (Truelove 2012). Initial coding led to 95 distinct categories, and a second round led to 10 mutually exclusive categories that accounted for 80.34% of responses with 153 responses (19.66%) not falling into one clear category. A second coder reviewed all word responses to ensure reliability of coding, revealing a sufficient amount of initial agreement (84%), and all discrepancies were resolved through discussion. Categories, percentages, and common responses are listed in Table 2.

[Table 2 Here]

Many participants' automatic responses referred to anatomical and sexual terminology or to aspects of the product and procedure itself. Some indicated general positive sentiment or amazement, and terms indicating the contraceptive's effectiveness were fairly common. Although fewer individuals indicated general negative sentiment or used terms indicating the contraceptive's ineffectiveness or risks, concerns about physical pain were high, with 'pain' or 'painful' as the most commonly provided terms overall. Some particularly interesting categories focused on the contraceptive as a new innovation, described it as weird or odd, or displayed the participants' interest or curiosity in learning more.

For all statistical analyses, pairwise deletion was utilised to address missing data so as to maintain as much power per analysis as possible. Hierarchical multiple regressions examined whether conformity to masculine norms predicted outcomes beyond relevant demographic factors and if affective and cognitive processes explained variance in the outcomes beyond the masculine norms. The sample was generally homogeneous but participants varied in ethnicity (0 = white, 1 = person of colour), relationship status (single = 0, in a relationship = 1), and sexual activity (0 = never sexually active, 1 = ever sexually active), which were included as control variables in Step 1. The nine masculine norms were each included in Step 2, and the seven affective and cognitive

factors (affective valence of automatic associations, positive emotions, negative emotions, efficacy beliefs, negative sex beliefs, inconvenience belief, and expensive belief) were each included in Step 3. Table 3 and Table 4 contain full statistical details for each regression.

[Table 3 Here]

For the first regression, willingness-to-try was the criterion variable. Step 1 was statistically significant,  $F(3, 128) = 5.08, p = .002, R^2 = .11$ , with sexual activity as the only significant predictor of men's willingness-to-try. In Step 2, the masculine norms contributed unique variance in predicting men's willingness-to-try,  $F(12, 119) = 3.28, p < .001, R^2 = .25, \Delta R^2 = .14$ . Both Heterosexual Self-Presentation and Power Over Women were significant negative predictors, meaning that stronger conformity to these specific norms led to lower willingness-to-try. However, other masculine norms were not statistically significant. In Step 3, control variables and masculine norms were no longer statistically significant, but affective and cognitive factors contributed unique variance to willingness-to-try,  $F(19, 112) = 6.47, p < .001, R^2 = .52, \Delta R^2 = .28$ . Positive emotions and efficacy beliefs were positive predictors, while greater negative sex beliefs and inconvenience belief each led to lower willingness-to-try. Affective valence of automatic associations, negative emotions, and expensive belief were not significant predictors. Multicollinearity was not indicated in the regression analyses as tolerance scores were greater than .1 (lowest score = .44) and VIF scores were less than 10 (highest score = 2.26).

The reduction in the masculine norms' predictive power once affective and cognitive processes were entered into the regression suggested a possible mediation. Therefore, indirect effect analyses were conducted with the PROCESS macro to SPSS (Hayes 2012), using bootstrapping with 5,000 iterations. All variables were standardised prior to analysis so that standardised coefficients could be provided.

The first analysis examined the indirect effect of Heterosexual Self-Presentation on willingness-to-try through positive emotions, efficacy beliefs, negative sex beliefs, and inconvenience belief as individual mediators and with ethnicity, relationship status, and sexual activity as control variables (see Figure 1). Heterosexual Self-Presentation had a significant positive relationship with both cognitive mediators: negative sex beliefs and inconvenience belief, which both negatively predicted willingness-to-try. There was a negative indirect effect on willingness-to-try through negative sex beliefs (95% *CI*: -.12, -.01) and inconvenience belief (95% *CI*: -.07, -.001), but none of the indirect effects through affective mediators were significant (95% *CI*s included 0). Heterosexual Self-Presentation maintained a direct negative effect on willingness-to-try and the total effect of Heterosexual Self-Presentation on willingness-to-try, including direct and indirect effects, was statistically significant ( $\beta = -.10$ , 95% *CI*: -.18, -.02).

[Figure 1 Here]

A similar pattern was found when investigating the indirect effect of Power over Women on willingness-to-try. Power over Women also had a significant positive relationship with negative sex beliefs, but in this case was not related to inconvenience belief. Negative sex beliefs again negatively predicted willingness-to-try. The test of indirect effects revealed a negative indirect effect through negative sex beliefs (95% *CI*: -0.17, -0.01), but not through the other factors (95% *CI*s included 0). Power over Women maintained a direct negative effect, and the total effect from Power over Women to willingness-to-try was statistically significant ( $\beta = -.15$ , 95% *CI*: -.27, -.04).

Overall, weaker effects were found when conducting the same hierarchical multiple regression with information-seeking as the criterion variable (see Table 4). Sexual activity was similarly a significant predictor in Step 1 although this full model was not significant,  $F(3, 128) = 2.41$ ,  $p = .07$ ,  $R^2 = .05$ . Although Step 2 added to the variance explained,  $F(12, 119) = 1.92$ ,  $p =$

.04,  $R^2 = .16$ ,  $\Delta R^2 = .11$ , neither Heterosexual Self-Presentation nor Power over Women contributed significantly on their own. Step 3 also added to the variance explained,  $F(19, 112) = 3.53$ ,  $p < .001$ ,  $R^2 = .38$ ,  $\Delta R^2 = .21$ , with positive emotions as the only statistically significant contributor. Since neither of the masculine norms significantly predicted information-seeking, mediation was not examined.

[Table 4 Here]

## Discussion

This work extends our understanding of how specific masculine norms differentially relate to health decision-making and contraception decisions in particular. It also introduces a new framework for understanding the affective and cognitive mechanisms through which these processes occur. As predicted, Heterosexual Self-Presentation and Power Over Women, two norms that have previously been linked to reduced interest in using contraceptives (Hernández-Aguilera and Marván 2016; Limmer 2016), were negative predictors of willingness-to-try RISUG. These relationships were mediated by cognitive processes, specifically beliefs about how the contraceptive will negatively impact sexual encounters.

These two norms in particular support a hypermasculine approach to sexual behaviour, where men may feel inclined to distinguish themselves from both women and other marginalised male identities, in particular, gay men. Part of displaying power over women and heterosexuality may also include the demonstration or assertion of one's virility and fertility. The negative sex beliefs scale seems to be capturing concern that RISUG poses a threat to hypermasculinity by lowering sexual satisfaction and desire and by making men in this sample feel more feminine. Noar and Morokoff (2002) also found that condom attitudes mediated the relationships between masculine norms and condom usage, and their attitudes scale included items similar to our negative

sex beliefs scale (e.g., ‘using condoms interrupts the pleasure of sex’). Therefore, men who focus on displaying their masculinity in a hypermasculine way may hold greater negative sex beliefs that reduce many contraceptive behaviours. Alternately, men who do not endorse Heterosexual Self-Presentation and Power over Women may be more open to a range of male contraceptives, although more investigations are needed to further support this possibility.

Playboy norms did not demonstrate the hypothesised positive relationship with contraceptive decision-making. This may be due to the contradictory impacts of desire for multiple partners without concern about pregnancy (positive influence) and a similar desire to demonstrate virility as discussed in regard to hypermasculinity (negative influence). Future research could specifically examine pregnancy concern and virility concern as separate mediators between endorsement of Playboy norms and contraceptive decision-making to examine if these pathways are acting in parallel but opposite directions.

Interestingly, affective processes did not mediate the relationships between masculine norms and the contraceptive outcomes. The negative sex beliefs scale included negatively valenced cognitions, and these simply may have been more direct predictors of decision-making than the negative emotions. There was also a floor effect on the negative emotion scale ( $M = 1.46$ ,  $SD = 0.50$  on a scale from 1 to 4), indicating that these negative emotions were only mildly felt by men in this sample. On the other hand, positive emotions did not mediate any of the observed relationships, but they were by far one of the strongest independent predictors of both contraceptive outcomes. In this case, the influence of positive emotions was not muted by the more positively valenced efficacy beliefs. Additionally, many automatic associations related to efficacy of the product, positive sentiments, or the new innovation it represents, which could easily be tied to feeling secure, happy, and optimistic. This supports previous findings highlighting the

importance of affective processes in health decision-making (Ellis, Rajagopal, and Kiviniemi 2018; Keer, van den Putte, and Neijens 2010), and it also demonstrates that these positive emotional responses to the new contraceptive are acting independently from masculine norms.

Neither Self-Reliance nor Emotional Control related to contraceptive decision-making as predicted. This may result from the outcome measures being aimed at participants' interest and intentions rather than actual behavioural measures. The links may be stronger in future research that measures men's actual behaviour of scheduling and attending doctor's appointments to receive male contraceptives.

Fewer factors predicted information-seeking than willingness-to-try, perhaps owing to information-seeking being less threatening and rather highly endorsed in the sample (61.6% indicated 'probably yes' or 'definitely yes'). Willingness-to-try percentage (41.5% said 'probably yes' or 'definitely yes') is on the lower end of what has been reported for endorsement of a male hormonal pill (44-83% from Martin et al. 2000; 49.5% from Walker 2011) or an injectable hormonal contraceptive (32-62%; Martin et al. 2000; 66% from Meriggiola et al. 2006). Since RISUG involved both a doctor's visit and a particularly invasive procedure (with 'pain' as the most common automatic association), these findings may be more generalisable to procedures such as vasectomies, but less to contraceptives such as hormonal pills or condoms.

### *Limitations*

We chose to investigate RISUG to understand men's reactions to a novel male contraceptive since it has gone through phase III clinical trials in India, is in pre-clinical animal trials in the U.S., and will likely be on the market within the next few years (Sifferlin 2018). However, since it is not yet available in the U.S., we are limited to examining behavioural intentions. As the prevalence of different male contraceptives expands, it will remove

technological constraints placed on men's ability to act as the primary contraceptive in heterosexual relationships (Fennell 2011). It is possible that increased access may begin to change men's behaviour and perhaps begin to alter masculine norms surrounding contraceptive responsibility in heterosexual relationships, particularly if the contraceptives are marketed to reframe this responsibility by highlighting masculine norms such as Self-Reliance.

A limitation of the survey methodology is that these data are correlational, so the relationships between variables should not be interpreted causally. Most of the survey questions are close-ended, limiting participants' ability to share opinions that are not included and potentially suggesting ideas to participants that they did not initially hold. Although some open-ended responses were offered to obtain their automatic word associations, future qualitative interviews or focus groups may give more insight into the nuances involved in men's contraceptive decision-making.

The sample is also limited to a rather homogenous set of U.S. college students (majority young, white, and heterosexual). Therefore, the degree of endorsement of specific masculine norms, including Power over Women and Heterosexual Self-Presentation that specifically predict negative responses to the contraceptive, may differ in other men. Higher educational attainment has previously been linked to outcomes such as more consistent contraceptive use (e.g., Bailey et al. 2008). Additionally, since RISUG is only aimed at preventing pregnancy during male-female sexual intercourse, it may not be of interest to gay men, some transgender individuals, or men who prefer a contraceptive that also provides protection against STIs. However, since these young men are likely to be some of the first to take advantage of this contraceptive, they are a reasonable group to investigate. Future research may find that different masculine gender norms are influential

when focusing on other subsets of men or on other safe sex or contraceptive behaviours such as condom use.

### ***Implications***

These findings offer implications for policy and practice. First, they suggest the utility of framing discussions by working within the existing relevant masculine norms to help overcome barriers to the health behaviour in question. Messages about male contraceptives that engage with the hypermasculinity concerns that unite Heterosexual Self-Presentation and Power over Women norms may be particularly effective at assuaging beliefs that male contraceptives will make men feel less masculine. Alternately, messaging can also aim to modify and directly challenge the relevant masculine norms to promote healthy decision-making. For example, organisations aimed at reducing violence against women often work to breakdown traditional notions of masculinity and violence by creating behaviour change programmes in which men make personal commitments to non-violence and encourage each other to intervene as active bystanders to disrupt violence or derogation of women (Crooks et al. 2007). Although reframing messages or education about overcoming gender scripts cannot address all structural inequities and cultural attitudes that may reduce men's access and interest in obtaining contraception, it can offer more knowledge and resources (Jackson 2019). Beyond contraceptive decision-making, similar research to identify the masculine norms most influential in explaining gaps observed between men and women on a variety of help-seeking and health promoting behaviours could improve the precision of prevention or intervention efforts aimed at men.

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Authors confirm that there is no conflict of interest.

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### **Appendix**

A new long-acting male birth control called RISUG has been developed by scientists. It has been used in India for the past 15 years, and it is currently going through trials in the U.S. This description provides information about how the product will be used when it is made available in the U.S.

RISUG is a gel. The use of RISUG involves going to a doctor who will insert the gel into the penis. This gel prevents sperm from being released during ejaculation. Ejaculation will still occur; however, sperm will not be present in the fluid. RISUG has been shown to be 99.85% effective in pregnancy prevention. The procedure is reversible, and if a man wishes to restore the flow of sperm after several months or years, a doctor can flush the gel out.

**Table 1.** Means, standard deviations, and Cronbach's alphas for variables.

Variable	<i>M</i>	<i>SD</i>	<i>a</i>
Playboy	2.11	0.59	.72
Heterosexual self-presentation	2.30	0.66	.86
Power over women	1.70	0.56	.83
Self-reliance	2.35	0.49	.73
Emotional control	2.41	0.59	.87
Winning	2.61	0.63	.88
Risk-taking	2.45	0.51	.79
Violence	2.74	0.59	.83
Primacy of work	2.39	0.51	.65
Affective association	3.22	0.78	n/a
Positive emotions	2.19	0.86	.77
Negative emotions	1.46	0.50	.70
Efficacy beliefs	3.52	0.70	.75
Negative sex beliefs	2.41	0.92	.80
Inconvenience belief	3.10	1.02	n/a
Expensive belief	3.35	0.90	n/a
Willingness-to-try	2.27	0.80	n/a
Information-seeking	2.70	0.86	n/a

**Table 2.** Coding of the automatic associations

Categories	Response %	Common terms (Number of responses)
Anatomical or sexual terminology	14.99%	Sperm (24), Sex (22), Penis (18), Male (10), Pregnancy (9)
Effectiveness	11.76%	Effective (18), Safe (17), Reversible (13), Prevention (12), Useful (8), Helpful (8)
Product or procedure	9.95%	Gel (29), Doctor (7), Birth Control (6), Inject (4)
Pain or discomfort	8.53%	Painful (35), Uncomfortable (15), Ouch (5), Hurt (5)
General positive sentiment or amazement	8.01%	Good (8), Great (5), Awesome (4), Amazing (4), Wow (4), Surprising (4)
Interest or further questions	6.72%	Interesting (32), How (4)
Ineffectiveness or risks	6.33%	Risky (6), Dangerous (5), Scary (5), Problematic (4)
Weird or odd	5.04%	Weird (12), Strange (7), Odd (6), Crazy (5)
General negative sentiment	4.65%	No (5), Gross (5)
Innovation	4.36%	New (7), Future (5)

Note: Common terms includes the five most commonly provided responses in each category that were stated by at least four different participants. More than five responses are listed in a category if several responses had the same lowest frequency.

**Table 3.** Hierarchical regression of control variables, conformity to masculine norms, and affective and cognitive processes predicting men's willingness-to-try

Variable	Step 1				Step 2				Step 3			
	<i>B</i>	<i>SE</i> ( <i>B</i> )	$\beta$	95% CI for <i>B</i>	<i>B</i>	<i>SE</i> ( <i>B</i> )	$\beta$	95% CI for <i>B</i>	<i>B</i>	<i>SE</i> ( <i>B</i> )	$\beta$	95% CI for <i>B</i>
Ethnicity	-.24	.14	-.15	(-.51, .03)	-.19	.14	-.12	(-.47, .09)	-.08	.12	-.05	(-.31, .15)
Relationship status	.28	.14	.17	(-.01, .56)	.29	.14	.18*	(.01, .58)	.20	.12	.12	(-.04, .44)
Sexual activity	.39	.17	.20*	(.06, .72)	.32	.17	.16	(-.03, .66)	.13	.15	.07	(-.17, .42)
Playboy					.14	.12	.10	(-.11, .38)	.10	.10	.07	(-.11, .31)
Heterosexual self- presentation					-.28	.12	-.24*	(-.53, -.04)	-.18	.11	-.15	(-.39, .03)
Power over women					-.32	.14	-.22*	(-.60, -.04)	-.13	.12	-.09	(-.37, .12)
Self-reliance					-.02	.14	-.01	(-.31, .26)	-.05	.12	-.03	(-.29, .19)
Emotional control					.07	.13	.05	(-.18, .32)	.04	.10	.03	(-.16, .25)
Winning					.09	.12	.08	(-.14, .33)	.05	.10	.04	(-.15, .24)
Risk-taking					-.15	.13	-.09	(-.41, .12)	-.14	.12	-.09	(-.37, .09)
Violence					-.11	.12	-.08	(-.35, .13)	-.05	.11	-.04	(-.26, .16)
Primacy of work					.13	.13	.08	(-.13, .40)	.20	.12	.13	(-.03, .43)
Affective association									.02	.10	.02	(-.18, .22)
Positive emotions									.23	.08	.25**	(.08, .39)
Negative emotions									-.05	.13	-.03	(-.32, .21)
Efficacy beliefs									.21	.09	.18*	(.02, .39)
Negative sex beliefs									-.19	.08	-.21*	(-.35, -.03)
Inconvenience belief									-.14	.07	-.18*	(-.27, -.01)
Expensive belief									.09	.07	.10	(-.05, .23)

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .  $N = 132$  for regression.

**Table 4.** Hierarchical regression of control variables, conformity to masculine norms, and affective and cognitive processes predicting men's information-seeking

Variable	Step 1				Step 2				Step 3			
	<i>B</i>	<i>SE</i> ( <i>B</i> )	$\beta$	95% CI for <i>B</i>	<i>B</i>	<i>SE</i> ( <i>B</i> )	$\beta$	95% CI for <i>B</i>	<i>B</i>	<i>SE</i> ( <i>B</i> )	$\beta$	95% CI for <i>B</i>
Ethnicity	-.12	.15	-.07	(-.41, .18)	-.15	.16	-.09	(-.45, .16)	-.07	.14	-.04	(-.34, .21)
Relationship status	.10	.15	.06	(-.21, .40)	.07	.16	.04	(-.24, .39)	-.03	.14	-.02	(-.31, .26)
Sexual activity	.41	.18	.20*	(.05, .77)	.49	.19	.24*	(.10, .87)	.28	.18	.14	(-.07, .64)
Playboy					-.19	.14	-.13	(-.45, .09)	-.23	.13	-.16	(-.47, .02)
Heterosexual self- presentation					-.26	.14	-.21	(-.53, .004)	-.15	.13	-.12	(-.40, .10)
Power over women					-.18	.16	-.12	(-.49, .13)	-.06	.15	-.04	(-.36, .24)
Self-reliance					-.12	.16	-.07	(-.43, .20)	-.15	.15	-.09	(-.44, .14)
Emotional control					.15	.14	.11	(-.12, .43)	.14	.12	.10	(-.10, .39)
Winning					.18	.13	.14	(-.08, .43)	.14	.12	.11	(-.09, .38)
Risk-taking					-.12	.15	-.07	(-.41, .18)	-.09	.14	-.06	(-.37, .18)
Violence					-.16	.13	-.11	(-.42, .11)	-.10	.13	-.07	(-.35, .15)
Primacy of work					.11	.15	.07	(-.18, .41)	.16	.14	.10	(-.12, .44)
Affective association									.001	.12	.001	(-.24, .24)
Positive emotions									.39	.10	.40***	(.20, .58)
Negative emotions									-.08	.16	-.05	(-.40, .23)
Efficacy beliefs									-.02	.11	-.01	(-.24, .20)
Negative sex beliefs									-.11	.10	-.12	(-.30, .09)
Inconvenience belief									-.11	.08	-.14	(-.27, .04)
Expensive belief									.06	.09	.06	(-.11, .23)

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .  $N = 132$  for regression.

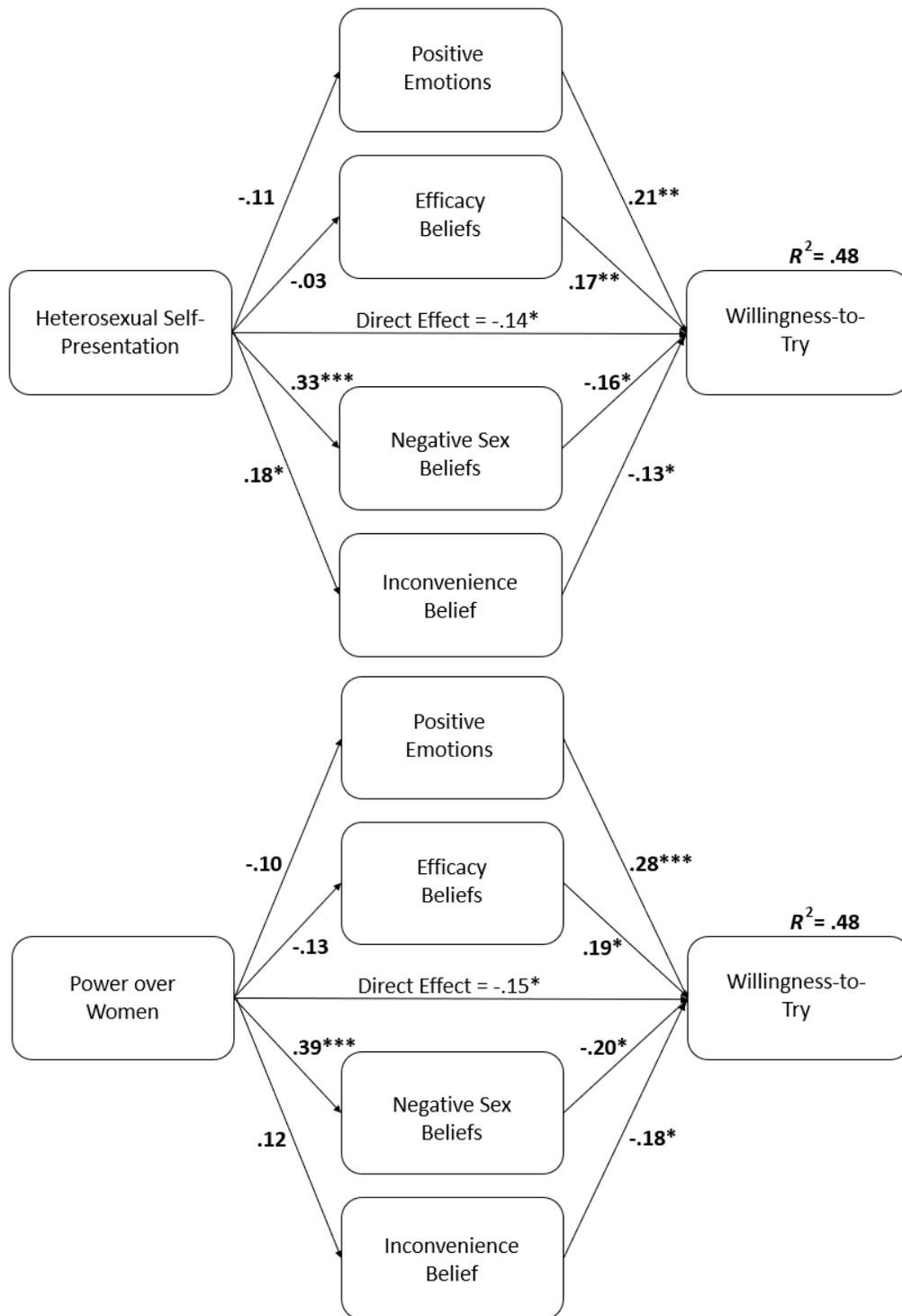


Figure 1. Model of indirect effects examining relationships between each masculine norm on willingness-to-try the male contraceptive through the affective and cognitive processes while controlling for ethnicity, relationship status, and sexual activity. Direct effects (standardised regression coefficients) are depicted. Indirect effects and total effects are reported in the text.  $*p < .05$ ,  $**p < .01$ ,  $***p < .001$ .  $N = 133$  for each mediation model.